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PREFACE

The 4th International Seminar on Public Health Education (ISPHE 2018) was held on The Wujil Resorts and Conventions, Semarang, Indonesia on May 8-9 2018 by the Faculty of Sports Science Universitas Negeri Semarang. The 328 scientific participants, 163 of whom were students, had many fruitful discussions and exchanges that contributed to the success of the conference. The 251 abstracts including poster session that were presented on the first two days formed the heart of the conference and provided ample opportunity for discussion. The abstracts were split almost equally between the four main conference areas, i.e.; Interdisciplinary Health and Medicine, Physiology, Kinesiology and Psychology of Wellness, Public Health Policies and Practices, and Health Promotion and Physical Education.

Of the total number of presented abstracts, 59 of these are included in this proceedings volume, the first time that abstracts have been published by Atlantis. Other publication options are 3 respectable scientific journals and one national proceedings. The review procedure was thoroughly done by two blind reviewers have reviewed each paper from the participant. There were 4 plenary lectures covering the different areas of the conference: Prof. Chia-Hua Kuo. Ph.D. (Dean of Research and Development University of Taipei, Taiwan) talked about the latest research on nutrition and food metabolism, Dr. Toru Okuwaki (Japan Institute of Sports Sciences) for sports development in Japan, Dr. Mahenderan Appukutty (Head of Postgraduate Studies UiTM, Malaysia) for nutritional science of early childhood and last are Dr. Sugeng Eko Irianto (WHO Representative of the Republic of Indonesia) and Prof. Dr. dr. Oktia Woro Kasmini Handayani, M.Kes (Universitas Negeri Semarang, Indonesia) on health and nutrition status in Indonesia.

Generous support for the conference was provided by the Indonesian Public Health Association (IAKMI) and some prominent Indonesia universities in health education and sport (Malang State University, Gorontalo State University, and Manado State University). The next ISPHE will take place in Semarang in 2020, and the ones after that will be in Malang in 2022 and Gorontalo in 2024. Given the rapidity with which science is advancing in all of the areas covered by ISPHE, we expect that these future ISPHE conferences will be as stimulating as this most recent one was, as indicated by the contributions presented in this proceedings volume.

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Mohammad Arif Ali
Rudatin Windraswara

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***Abstract*—Health promotion programs at schools have not reached the expected indicators. The purpose of this study was to get an overview of the implementation of health programs at junior high schools in Semarang. This research used quantitative and qualitative design. The sample were 4 junior high school in Semarang city. The results showed that 75% of schools have an equivalent School Health Policy, 75% of schools have a safe learning environment, skill-based health education in 50% school and skill-based healthcare services in 75% schools in the medium category.**

Keywords—evaluation, health, fresh, child friendly school

I. INTRODUCTION

Development to be achieved by the nation of Indonesia is the achievement of a developed and independent nation, prosperous birth and mind. One of the characteristics of a developed nation is to have a high degree of health, because the degree of health has a very large influence on the quality of human resources. Only with healthy resources will be more productive and improve the competitiveness of the nation [1].

Development of health aimed to increase awareness, willingness and ability to live healthy for every resident in order to realize optimal health status. Health degree is one factor that is very influential on the quality of human resources. Given the impact of behavior on a large degree of health (30-35% on health status), it is necessary to attempt to change unhealthy behaviors into health [2]. Healthy human resources will be more productive and enhance human competitiveness. To achieve the vision of health development in Indonesia, namely Indonesia Sehat 2017 has been determined a number of mission, strategy, program subjects and programs. One such program is the School Health Program. UU No. 23 of 1992 about Health states that School Health Enterprises (Usaha Kesehatan Sekolah – UKS) must be held in schools.

School is a formal and strategic institution in preparing healthy human resources physically, mentally, socially, and productively. One that influences the success of the teaching and learning process in school is the health status and condition of the school environment [3, 4]. School health is organized to improve the ability of healthy life of learners in a healthy environment so that learners can learn, grow, and develop in harmony and optimal to become a better quality human resources [5]. Some things that become problems in the development and promotion of health promotion programs in schools are: Clean and healthy life behavior (Perilaku Hidup Bersih dan Sehat – PHBS) has not reached the expected level, in addition to the threat of illness to high school students is still quite high with the presence of endemic disease and nutritional deficiencies.

School-aged children are faced with very complex and varied health problems. Health problems in children of kindergarten and elementary school are usually related to personal hygiene and environment such as brushing your teeth is good and right, hand washing habits with soap and other personal hygiene. While in children of junior and senior high school, the problem is related to risky behavior such as drug abuse (Narcotics, Psychotropic, and other Addictive Substances). Drug abuse caused changes in physical and psychological functions, and cause dependence [6]. In addition, unwanted pregnancies, unsafe abortions and Sexually Transmitted Diseases (STDs) can be a problem faced by teenagers due to premarital sex behavior.

Some things can be a factor of teenagers having sex outside of marriage. Lack of adolescent knowledge about reproductive health can be one of them. Low knowledge is accompanied by the strong influence of peers in adolescence to make teenagers to have unhealthy sexual attitudes and behavior [7]. The greatest consequences of premarital sexual behavior can result in adolescents affected by HIV / AIDS. Acquired immune deficiency syndrome (AIDS) can be interpreted as a collection of symptoms or diseases caused by decreased immunity due to infection Human Immunodeficiency Virus (HIV), AIDS is the final stage of HIV infection [8]. In addition, as for some things that become problems in the development and promotion of health promotion programs in schools, among others, clean and healthy life behavior has not reached at the expected level, in

addition to the threat of illness to high school students is still quite high with the disease endemic and malnutrition.

If seen further, the school actually has great potential to succeed health promotion program. Many schools can be utilized to instill the Clean and Healthy Behavior Program (PHBS) value. PHBS is a government program launched in 2006 that aims to change the behavior of unhealthy people to become healthy [9]. PHBS indicators in schools include snacks in the school canteen, hand washing with running water and soap, urinating and defecating in school toilets, and watering latrines with water after use, following sports activities and physical activities in the school, eradicating larvae mosquitoes in school regularly, not smoking at school, weigh the weight and height every month, and throw garbage in place [10]. The health promotion program can be integrated with the School Health Program (UKS) program which involves the participation of School Residents, School Committees, Community Health Centres and Communities who are partners in developing health promotion in schools.

The objectives of health promotion in schools include increasing students, teachers and the community of the school environment, improving a healthy, safe and comfortable school environment, improving health education in schools, improving access to health services in schools, teachers and the community of the school environment to improve public health around the school environment, improve the implementation of healthy policies and efforts at schools to promote health [11].

The strategy is implemented by conducting health education, health services, hygiene and environmental health, as well as the culture of PHBS. PHBS indicators in schools include snacks in the school canteen, hand washing with running water and soap, urinating and defecating in school toilets and watering latrines with water after use, following sports activities and physical activities at school, eradicating larvae mosquitoes at school regularly, not smoking in school, weighing weight and measuring height every month, throwing waste in place [3].

Various strategies have been pursued in efforts to improve health promotion in schools such as empowerment of schoolchildren and the community of the school environment in building a healthy school environment, promoting partnerships to improve health promotion efforts in schools, providing health education for children, reviewing research to improve health promotion programs in schools, providing access to health services that are promotive and preventive for learners, play an active role in improving public health. But the role of schools has not been optimal in developing health promotion in schools, there are still many schools lack of support for health promotion policies in schools [12] [13].

This study aimed to get an overview of the implementation of health programs in schools assessed using the FRESH (Focusing Resources on Effective School Health) instrument. From the results of this assessment is expected to be a material evaluation for schools to be able to apply appropriate health programs so that the achievement of a healthy school.

II. MATERIALS AND METHODS

This research was an observational research using quantitative and qualitative research design. Sample in this research were 4 junior high school in Semarang selected random by using simple random sampling technique. The selected schools were Madrasah Tsanawiyah Al-Islam Gunungpati, Madrasah Tsanawiyah Al-Islam Sumurrejo, SMP N 41 Semarang, and SMP N 22 Semarang.

The process of collecting qualitative data was done by observation or observation on the desired research object, beside that the researcher also conducting interview to the Headmaster, teacher, and student that was taken randomly in the research place. The interview guide used in this research was FRESH (Focusing Resources on Effective School Health) instrument.

FRESH is an instrument used to monitor and evaluate health programs at schools approved by WHO, UNICEF, UNESCO and other international agencies as a common framework for school health [14]. FRESH contains guidance on monitoring and evaluation of health programs at the national and school levels. The FRESH framework consists of 4 points, namely (1) equality school health policy, (2) safe learning environment, (3) skill-based health education, (4) school-based health and nutrition services [15] [16].

For quantitative data analysis use Likert Scale. Likert scale is the scale used to measure perceptions, attitudes or opinions of a person or group about an event or a social phenomenon, based on operational definitions established by researchers [17]. Assessment of the answers on the instrument of this study there were three levels, the categories of Good, Medium, and Less. The scoring guide was as follows: (1) Each question is given 0 if less, value 1 if it medium, and value 2 if good, (2) Determination of less level was maximal divided by the number of rating categories. The maximum value was the highest value multiplied by the number of rating categories, (3) The determination of the moderate level was more than the value of the level less up to two times the level of less, (4) Determination of the good level was the value of more than the value of moderate level up to the maximum value.

III. RESULT AND DISCUSSION

Monitoring and Evaluation of health programs using FRESH instruments have been implemented in 4 selected Junior High Schools. The purpose of this activity is to analyze the health needs and health programs in the school so that the results of Monitoring and Evaluation can be used in the improvement and the basis for determining the next policy in running the health program, so that the program will be run well in the future.

FRESH initiative represents a framework for the provision of school health programmes, the guidelines provided here are for the development of strategies that will improve the health, and thus educational outcomes, of school-age children and youth. However, evidence suggests that when schools become involved in meeting not only their students' academic needs, but also their fundamental need for health and wellbeing, parents, the whole community and the nation benefit as well.

Table 1. Total Scores and Category of School Assessment

SCHOOL NAME	FRESH CHECKLIST TOTAL SCORE			
	Checklist 2 : Equal School Health Policy	Checklist 4 : Safe Learning Environment	Checklist 6 : Skills-Based Health Education	Checklist 8 : School-Based Health and Nutrition Services
MTS Al-Islam Gunungpati	15 (Good)	13 (Medium)	7 (Poor)	5 (Medium)
MTS Al-Islam Sumurrejo	13 (Medium)	21 (Good)	15 (Medium)	11 (Good)
SMP N 41 Semarang	24 (Good)	16 (Good)	15 (Medium)	7 (Medium)
SMP N 22 Semarang	18 (Good)	21 (Good)	27 (Good)	13 (Medium)

Source: Primary Data, 2017

This activity is done by the method of interview with the number of 4 respondents namely Headmaster, Teachers, Officers UKS, and Students at each school. Each informant was given questions according to the guidance provided in the FRESH instrument divided into 4 checklists, namely equivalent school health policy, safe learning environment, skill-based health education, and school-based health and nutrition services. The results of this research were shown in table 1.

1. Equal School Health Policy

Based on the research conducted, 75% of schools have Equal Health Policy School with good category. At that point can be categorized at a good level because the school has a school policy in the form of regulations or discipline on written and unwritten health. The school's policy on health is set out in the School's Vision and Mission and listed on the Education Unit Level Curriculum (Kurikulum Tingkat Satuan Pendidikan – KTSP). KTSP is a curriculum applied in Indonesia although its implementation is still not maximal. KTSP is to establish and empower educational units through authorization (autonomy) to educational institutions and encourage schools to participate in participatory decision making in developing curriculum [18]. The school policy contains a ban on carrying and smoking, carrying sharp weapons to threaten or injure, carry or use illegal drugs / beverages within the school environment and maintain cleanliness in the school environment. Here's an excerpt from the Headmaster's statement:

> *"Kalo peraturan tidak boleh merokok, pasti itu peraturan yang pertama. Kami melarang tidak diperbolehkannya membawa ataupun merokok. Kemudian kalo kelas-kelas itu harus selalu bersih tidak ada sampah, depan kelas juga sama harus bersih. Kalo tata tertibnya ada mba kalo di tata terterib kurikulum KTSP itu ada."*
> *"If the rules should not smoke, that would be the first rule. We prohibit not allowing or smoking. Then if the classes should always be clean there is no garbage, the front of the same class should be clean. If there is a regulation mba kalo in the terterib curriculum KTSP curriculum exists."*

The procedures undertaken by schools to monitor and evaluate existing school policies. The school is always doing evalusi related programs or existing school policies. Evaluation is done at the end of each year. Here's the narrative from the Headmaster:

> *"Kalo biasanya evaluasi itu kami adakan setiap akhir tahun, kalo misalnya program ini terlaksana atau tidak, terus program ini terlaksana atau tidak."*
> *"If we usually conduct the evaluation every year-end, if for example the program is implemented or not, continue this program is done or not."*

In addition, the results obtained from interviews with students also showed a positive thing. Students are aware that there is a school policy on health at school. The existence of health regulations in this school is in line with Minister of Education and Culture of the Republic of Indonesia Regulation No. 64 of 2015 on Non-Smoking Area in School Environment which explains that the non-smoking area aims to create a clean, healthy, and smoke-free school environment. To support the Non-Smoking Area in the School Environment, Schools are required to do the following: a. include cigarette related restrictions in school rules; b. refusing any advertising, promotional, sponsorship, and / or cooperation offerings of any kind by a cigarette company c. impose a ban on the installation of billboards, advertisements, distribution of pamphlets, and other forms of advertising from cigarette companies or foundations circulating or installed in the School Neighborhood; d. prohibits the sale of cigarettes in canteen / school stalls, cooperatives or other forms of sale in the School Environment; and e. put a no-smoking area mark in the School Environment [19].

2. Safe Learning Environment

Environmental health is an ecological balance that must exist between humans and the environment in order to ensure a healthy state of humanity. The scope of environmental health includes: drinking water supply, waste water management and pollution control, solid waste disposal, vector control, pollution prevention / control, food hygiene [20]. Based on research conducted shows that 75% of schools have a safe learning environment. Learning environment can be interpreted with conditions, influences, and stimuli from outside which includes the physical, social, and intellectual influences that affect students [21]. The capacity of schools to meet the needs of healthy and safe physical learning is quite good. Drinking water is available on the day of the survey, although drinking water is only available to teachers and school staff. Clean water and soap for hand washing is available, but there are some schools whose clean water in the bathroom faucet does not flow. Here's an excerpt from an interview with the teacher:

"Air minum ada mbak, tapi ya itu hanya untuk guru. Kalau untuk siswa ya mereka bawa sendiri-sendiri. Kemudian untuk air bersih nanti bisa dilihat sendiri ya mbak, ada kok air bersih itu disana."
"Drinking water exists, but it's only for teachers. for their students to bring their own. Then for clean water can be seen, there is clean water there."

In relation to training activities that school staff members attend about creating a safe and healthy physical learning environment is lacking, staff support and maintain a safe learning environment. For example by way of warning students to always do good to others, always admonish students if students make mistakes.

At the time of the survey, the school environment indicated that the school has a warm and friendly atmosphere. The interaction between students with each other is well established. But for the Counselling facilities themselves from teachers and school staff staff no one has received training to develop the ability to create a good psychological environment, but staff and employees support and maintain a safe and healthy learning environment. The main purpose of Counselling and guidance services in schools is to provide support to the achievement of personal maturity, social skills, academic ability, and lead to the formation of individual career maturity that is expected to be useful in the future [22].

The availability of latrines at the school has met the minimum standard of available latrines namely 3 latrines for female participants and 3 latrines for male learners. Infrastructure facilities are also met. However, the number of latrines available is less to meet the number of students available.

The toilet serves as a defecation and / or small place. There is a minimum of 1 unit of latrines for every 40 male learners, 1 unit of latrines for every 30 female learners, and 1 unit toilet for teachers. Minimum number of latrines per school 3 units. Minimum area of 1 unit of latrine 2m2. The latrine must be walled, roofed, lockable, and easy to clean. Clean water is available in each toilet unit [23].

School-aged and teenage children are a phase in which a person will experience a transition and a good stage change in terms of emotions, body, interests and behavior. In this phase, adolescent behavior conditions show an increasingly worrying problem, especially the problem of Adolescent Reproductive Health (ARH) [24]. Bullying does not select the age or sex of the victim. Usually the victims in general are children who are weak, shy, quiet, and special (disabled, closed, clever, beautiful, or have certain body characteristics), which can be a mockery [25]. For bullying cases, the school handles and takes firm action in case of bullying in the school environment, we can confirm through our interviews with some students. When the interview took place, students also said that the school is very trying to protect and eliminate the case of bullying in the school environment, if there are such cases, then students who bullying will get a strict action from the school. Here's an excerpt from an interview with the teacher:

"untuk bullying disini kami sangat menindak tegas pelaku yang melakukan bullying mbak. Dulu pernah ada kasus anak malak gitu, minta 500 atau seribu rupiah, tapi kalau terus menerus kan juga itu ngganggu anak-anak yang lain ya. Jadi begitu kami dapat laporan, langsung kami panggil itu siswa yang malak terus kami beritahu dari guru BK. Biasanya pelanggaran seperti itu dicatat ke buku pelanggaran mbak."
"For bullying here we are cracking down on the actors who do bullying mbak. There used to be a case of malevolent so, ask for 500 or a thousand rupiah, but if it continues it also disrupt other children. So once we get the report, we immediately call the students who ask for money. Usually such violations are recorded to the book of offense."

3. Skills-Based Health Education

Based on research conducted, it shows that skill-based health education in 25% of schools are in good category, 50% in medium category, and 25% in the less category. The frequency of health taught in schools is lacking because there is no independent health-based learning as a special subject. However, there are several health topics that are tucked into another lesson (Counselling, Sporting). Extracurricular is basketball and scout, and there is no discussion about health topic at the time of extracurricular activity. Here's an excerpt from an interview with the teacher:

"belum ada mbak pelajaran yang khusus tentang kesehatan, ekstrakurikuler juga disini hanya ada pramuka dan basket. Untuk PMR belum ada, dulu sudah pernah ada tapi nggak jalan. Jadi yang ada hanya pramuka dan basket."
"There is no specific lesson about health, extracurricular only scout and basketball. For extracurricular health does not exist yet. "

Extracurricular activities are out-of-school educational activities to assist the development of learners according to their needs, potentials, talents, and interests through activities that are specifically undertaken by educators and / or education personnel who are capable and authorized in the school / madrasah [26].

In this year and in previous years, no health topics have been taught at a particular class level, nor is there a health topic discussed in light of the current conditions. The absence of teachers who receive appropriate training in skills-based health education including participatory teaching approaches is also one of the reasons why education-based scores are not maximized.

Guidelines for textbooks or curricula that cover health topics are also not owned by schools. But there are some posters that can be used to support the topic of health raised in the school environment. In practicing good health behaviors there are already some behaviors exemplified by the teacher, such as: not littering and good hand washing. But in terms of students they are not good enough to be able to perform health-

conscious behavior such as washing hands with soap. Here's an excerpt from an interview with the teacher:

> *"kalau seperti itu, kami dari pihak guru pasti selalu mengingatkan kok mbak, contohnya seperti buang sampah pada tempatnya, terus nyapu ini kelasnya jangan sampai kotor. Saya rasa anak-anak juga pasti paham kalau lingkungan sekolah itu harus bersih dan tidak boleh kotor."*
> *"If so, we from the teacher must always remind, for example like throwing garbage in place, keep sweeping the class. I think the kids must also understand that the school environment should be clean and should not be dirty."*

Some health topics students studied in the last 12 months are about drugs, anti-bullying and PHBS, only those topics are not taught in a special subject of health, but only inserted in the middle of other subjects. Establishment of student behavior in schools can be done through health education learning as part of the eyes of sport and health education that includes health materials both personal health and environmental health. Familiarize yourself to live healthy to students is not easy, because it takes intention and discipline. Through behaviorism approach of health education as a process of behavior change toward healthy with the application of strengthening when doing healthy life.

Health education is the process of assisting a person, by acting individually or collectively, to make informed decisions about matters affecting his or her personal health and others to improve the ability of the community to maintain its health and not only relate to the improvement of knowledge, and practice, but also improve or improve the environment (both physical and non-physical) in order to maintain and improve health with full awareness. The purpose of health education is to improve the ability of the community to maintain and improve the degree of health, both physical, mental and social so as to be productive economically and socially, health education in all health programs; both the eradication of communicable diseases, environmental sanitation, community nutrition, health services, and other health programs [27].

4. School-Based Health and Nutrition Services

Based on the research conducted, the data show that skill-based health services in 75% of schools are in the medium category. This is reinforced by drinking water available at school only for teachers only, while students do not get drinking water but must buy independently in the school cafeteria. The school also has a partnership with Public Health Centre that organizes various activities such as Counselling and examination on dental health, mouth, eyes, PHBS in schools conducted every year. Here are the results of interviews with students:

> *"Pernah dimasukin puskesmas ok mba, yang meriska-meriksa gitu kaya gigi, mata, mulut. Terus ngasih tau yang kurang sehat kayah harus gosok gigi, telinganya harus dibersihin"*
> *"Once there was a health center, which examined teeth, eyes, mouth. Continue to tell the unhealthy to brush teeth, ears must be cleaned, and others."*

UKS is part of the main health effort that is the burden of Public Health Centre tasks addressed to schools with children and their environment, in order to achieve the state of health of children as well as possible and at the same time improve learning achievement of school children as high. Each school is required to have a UKS (School Health Effort). The local government must prepare the budget to achieve the targets set in the national minimum service standards. Therefore, the implementation of the UKS program should be the seriousness of local government [28].

Based on direct observation at the time of the research, the existence of UKS in some schools was not maintained and did not work properly due to the lack of school facilities. UKS has no wall clock, height meter, stretcher, dumpster. There is already a bed but no blankets, body scales but the condition is damaged, available in first aid but limited in number, so it is necessary to maintain and supervise UKS.

It also shows that the UKS has not been well implemented due to the lack of training programs for UKS coaches in schools from Public Health Centre or Health Department. UKS Program in the effort to improve education and health of learners hence role of health officer have very important role and intensity of development and development of UKS need to be increased so that child health degree and school environment achieved by health education, health service and healthy environment development, and his obligations as a community servant in addition to teachers who every day face learners.

IV. Conclusion

Evaluation Result of Health Program using FRESH instrument as an Effort for the Establishment of Child Friendly School in Semarang City can be concluded that: 75% of schools have equivalent School Health Policy, because it has school policy in the form of regulation or order about written and unwritten health policy. 75% of schools have a safe learning environment, because the capacity of schools to meet the needs of healthy and safe physical learning has been met. Skills-based health education in 25% of schools is in good category, 50% in medium category, and 25% in less category because of the frequency of health taught less and the absence of independent health-based lessons as a special subject. There are only a few health topics tucked into another lesson (Counselling, Sporting). Skills-based healthcare services categorize 75% of schools in the medium category, because drinking water is available only for staff and teachers, while students are not receiving drinking water. The existence of UKS is not well maintained and has not been implemented properly. However, this school has a partnership with Public Health Centre (Puskesmas) that organizes various activities such as Counselling and examination on dental health, mouth, eyes, and PHBS in schools.

Improving school programs, especially in the field of health education to support the realization of child-friendly schools

needs to be improved. Improvement of facilities and infrastructure especially UKS, providing skills-based education such as Adolescent Red Cross (Palang Merah Remaja), Little Doctor (Dokter Kecil), and other skills in the field of health to teachers and students. The need for the Office of Education policy to include health-based subjects within the learning curriculum. Then for Department of Health can provide training to teachers or students to have health-based skills.

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The Correlation between Genital Hygiene and Pathological White Discharge on Students at Vocational High School

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***Abstract*— One of the factors that can cause pathological vaginal discharge is Genital hygiene that is not true. This study aims to determine the Genital Relationship Hygiene with Pathological Whitishes to the students in SMK this research is cross sectional with the number of samples of 86 female students were taken by purposive sampling method. Univariate analysis with frequency distribution and bivariate analysis using Chi square test statistic. Univariate analysis tests obtained that most of the respondents had not good genital hygiene behavior as many as 74 students (87%) and had pathological white discharge as many as 62 students (72.1%). Bivariat analysis test using Chi square obtained p-value = 0.000, so that there was a correlation between genital hygiene and pathological white discharge.There was a correlation between genital hygiene and pathological white discharge.**

Keywords— genital hygiene, pathological white discharge

I. INTRODUCTION

Every woman will normally secrete a small amount of vaginal fluid, which is clear. If this discharge does not cause itching, or does not smell bad, this is not a problem .[33] Bacterial vaginosis is a major cause of pathological whiteness, with a prevalence of up to 48%. In various populations worldwide Bacterial vaginosis is seen in women without sexually active symptoms of 9-50.9%, in pregnant women 4.9-52%, and in adolescents 13-31.9% .[11]

The untreated pathological bleeding effect for adolescents will continue throughout pregnancy, childbirth and childbirth. Whitish is a sign or symptom of a female reproductive tract infection that can have serious repercussions. Untreated leucorrhea other than getting worse if left will spread to the internal organs. Pathological infection or whiteness on the outside of it on an ongoing basis can lead to the abdominal space in the form of wall-covering infections (peritonitis) .[13]

II. MATERIALS AND METHODS

A. Pesantren Community

Pondok Pesantren is an Islamic educational institution with boarding school system, thus forming a separate community whose members consist of the students, teachers or ustadz and family caretaker pesantren. Given the number of santri, certainly not impossible some of them there are less aware of the importance of health. Therefore it is not surprising that a disease will quickly spread to members of the pesantren community. Therefore every member of the pesantren community needs to know and understand health problems, both to maintain individual health and health together. Adolescent reproductive health is determined by how the teen is in caring for and maintaining the cleanliness of his genital devices .[14]

B. Whitish Effects

The untreated pathological bleeding effect for adolescents will continue throughout pregnancy, childbirth and childbirth. Whitish is a sign or symptom of a female reproductive tract infection that can have serious repercussions. Untreated leucorrhea other than getting worse if left will spread to the internal organs. Pathological infection or whiteness on the outside of it on an ongoing basis can lead to the abdominal space in the form of wall-covering infections (peritonitis) [13]

This study uses correlation study method with cross sectional approach, conducted in SMK (Sekolah Menengah Kejuruan) Askhabul Kahfi Gunungpati Semarang 5 and 6 August 2016. The population in this study is all students of SMK Askhabul Kahfi as many as 86 female students, samples taken are 86 students. Sampling techniques used is purposive sampling. This research uses questionnaires collection tool. The analysis used is univariate analysis with frequency distribution and bivariate analysis using Chi square test statistic.

III. RESULT AND DISCUSSION

TABLE 1. FREQUENCY DISTRIBUTION INDEX

Table Head	Table Column Head		
	Genital Hygiene	***Frekuensi***	***Percentage***
1	Not hygiene	74	86
2	Hygiene	12	14

Based on table 1 above, it can be seen that Genital hygiene at SMK AskhabulKahfiGunungpati Year 2016, from 86 female students, there are 74 students (86%), which is bigger than the students who has hygiene only 12 students (14%).

TABLE 2. EXPERIENCE IN VAGINAL DISCHARGE, THIS CONDITION SERVES TO CLEAN

No	Table frecuency Distribusi of Patological		
	Genital Hygiene	***Frekuensi***	***Percentage***
1	Experience	62	72,1
2	Not experience	24	27,9

Based on table 2 above, it can be seen that most of the students at SMK Askhabul Kahfi Gunungpati Year 2016 experience pathological vaginal discharge, totally 62 students (72.1%).

TABLE 3. EXPERIENCE IN VAGINAL DISCHARGE. THIS CONDITION SERVES TO CLEAN

Genital hygene	Pathological vaginal discharge		
	Experience	***Not experience***	***Total***
No hygiene	59	15	74
Hygiene	3	9	12

Based on table 3, from the total respondents of 86 female students who do *Genital hygiene* with no hygiene experience in pathologicalvaginal dischargetotally 59 students (79.7%), but from those who do *Genital hygiene* with no hygiene there is no pathological vaginal discharge totally 15 students (20, 3%), then the students who do *Genital hygiene* with hygiene from 12 female students there are 3 female students (25%) who experienced pathological vaginal discharge and the rest do not experience in pathological vaginal dischargetotally 9 female students (75%).

Discusion

*Genital hygiene*in most of the student at SMK AskhabulKahfinot *hygiene*, from 74 students who are not hygiene 52 students (60.5%) clean the genitals after defecating from the back to the front or from the anus to the vagina and only some of them who clean the vagina to the anus of 34 female students (39.5%). It seems like of a large number of the female students clean the rest of defecating movements from the anus to the vagina may be because they do not know that washing the genital from the anus to the vagina is wrong, this is due to the lack of information they get about *Genital hygiene*, otherwise they are unlikely to notice from which direction to wash the vagina, they clean the dirty part firstly to the clean area, whereas there are a lot of bacteria in the rectum, which can carry into the vagina and can cause problems that is pathological vagina discharge

The result of the research shows that from 86 respondents, there are 62 female students (72.1%), while those who do not have pathological vaginal discharge were only 24 students (27.9%).

Based on the research data above there are only a small proportion of respondents who do not experience pathological vaginal discharge which means that the students experience in physiologic vaginal dischargein total 24 female students (27.9%). This is because physiological vaginal discharge is a normal one experienced by every woman in her menstruation cycle. Certainty, all of the women have and protect the vagina from the infection. Pregnant women will also usually experience in vaginal discharge related to the pregnancy. When someone experience in vaginal discharge, one will remove mucus from her vagina. Mucus produced by the cervix and glands in the vagina will come out with dead cells and bacteria.

Normally, every woman will secrete little fluid from vaginal, which is clear. If the discharge of this fluid does not cause itching, or does not smell bad, this is not bea problem [33]. The defense system of the female genitals is quite good, starting from the base acid. Another defense with mucus expenditure that always flows outwards causes the bacteria to be removed and in the form of menstruation. Normal or physiological vaginal discharge can occur in the period leading up to and after menstruation, around the phase of secretion between the day of 10-16 menstruation, also it occurs through the sexual stimulation [13].

Based on table 4.3, of total respondents are 86 students who do *Genital hygiene* with no *hygiene* experience in pathology vaginal dischargein total 59 female students (79,7). The results also show the students who Genital hygiene performed with hygiene of 12 female students who did not experience pathological vaginal discharge totally 9 female students (75%). This is because someone who does *genetal hygiene* well will avoid pathological vaginal discharge. Reproductive health of the teenager is determined by how the teenager is in caring for and maintaining the cleanliness of his genital devices. Female teenagers are more susceptible to genital infections if they do not keep their genitalia clean because the vaginal organs are located close to the rectum

CONCLUSION

Based on the results of research on Genital Hygiene Relationship with Whitish Pathology at the students at SMK Askhabul Kahfi Gunungpati Semarang Year 2016, it can be drawn conclusion. There is a relationship between genital hygiene with pathology whiteness at schoolgirls at SMK Askhabul Kahfi Gunungpati Semarang Year 2016 with p-value 0.000 ($p < \alpha = 0,05$), OR = 11,800 mean student who Genital hygiennya not hygiene have risk 11,8 times higher experienced pathological pathology compared to hygiene schoolgirls

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Sweet Orange Juice : Blood Glucose Level After Having Anaerobic Activity

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***Abstract*—The influence of blood glucose during exercise is a factor that affects the performance of the athlete. Blood glucose levels can be affected by things like activity or exercise, food and stress. If blood glucose levels decline, the function of brain cells is disrupted because nerve cells do not store carbohydrates as a result will have an impact on the decrease of athlete performance. Providing a sports drink with a 6-8% carbohydrate can help improve the performance of the athlete. Giving sweet orange juice is a fruit that contains liquid, electrolytes, and carbohydrates can be used to replace lost fluids. The purpose of this study is to know the effect of the use of sweet orange juice to blood glucose. The research method used is laboratory experimental research, with research design used is pre - posttest group design. Sampling was conducted as many as 20 Students of Sports Science who were divided by control group and treatment group, men, age 20-23 years, healthy, and did not take supplements during the study. The result of this research is that there is a significant difference between pre and post in control group and treatment group that is control group P = 0,016 while treatment group P = 0,001. The conclusion that can be drawn from this research is that the provision of sweet orange affects glucose levels after anaerobic activity.**

Keywords— blood glucose, sweet orange juice, anaerobic activity

I. INTRODUCTION

Exercise can decrease blood glucose levels through increased muscle glucose intake, receptor sensitivity, and glucose transport. Exercise improves glucose transport through muscle contraction. Muscle contraction leads to an increase in the need for glucose in the muscles through the mechanism of insulin, signaling that GLUT4 switches the cell surface to bring glucose (Wulandari, 2013).

The availability of blood glucose during exercise is a factor that affects the performance of the athlete. Blood glucose levels can be affected by things like activity or exercise, food, and stress. When blood glucose levels decline, brain cell function is impaired because nerve cells do not store carbohydrates, as a result, will have an impact on decreasing athlete performance [5].

Muscle contractions always require ATP as energy, so rapid metabolism of energy in cells is required to produce ATP. The greater the muscle contraction the greater the amount of ATP required. One of the dominant metabolic systems of energy during high-intensity physical exercise is the anaerobic glycolysis system. Anaerobic glycolysis systems have characteristics such as causing the formation of lactic acid, requiring no oxygen, and only using glucose or muscle glycogen as an energy source [4].

Liquids and minerals lost through sweat during exercise should be replaced either during exercise or afterward. There have been many sports drinks specially designed to replace fluids, minerals, and glucose during and after exercise [7].

Provision of beverages containing carbohydrates can help the body to prevent dehydration, maintaining blood glucose concentration and glycogen storage [1]. Providing a sports drink with a 6-8% carbohydrate can help improve the performance of the athlete. Giving sweet orange juice is a fruit that contains liquid, electrolytes, and carbohydrates that can be used to replace lost fluids.

An Orange consist of water (86-92%), sugar (5-8%), pectin (1-2%), glycosides (0.1-1.5%), pentose (0.8-1.2% %), citric acid (0.4-1.5%), fiber (0.6-0.9%), protein (0.6-0.8%), fat (0.2-0.5%), minerals (0,5-0,9%) and essential oil (0,2-0,5%) (Siddiqi, 2005). An Orange and orange juice have many benefits because they contain potassium, calcium, folate, thiamin, niacin, vitamin B6, phosphorus, magnesium and copper

During exercise or physical exercise, many bodies lose fluids that lead to dehydration. Disease loss of 1-2% of body weight, evidence indicating that dehydration levels can significantly interfere with endurance and skill handling. Grapefruit juice can be used more as a substitute for fluids and electrolytes in preparation for, during and after exercise and competition (Baros, 2011). This study aims to determine the effect of sweet orange juice on blood glucose after anaerobic activity.

II. MATERIALS AND METHODS

A. Subject

Twenty man volunteers by using purposive random sampling who were all healthy, man between the ages 20 – 25

years, have normal body mass index. The control group was 10 people and the treatment group was 10 people. The criteria for population harvesting are as follows: 1) sample of male and female of 20 - 23 years old. 2) A sample is a student of FIK UNESA 3) sample not taking the supplement during research. 4) No smoking sample. 5) Able-bodied sample.

B. Instrument and Procedure

The process of conducting the study is the subjects retrieved preliminary data for glucose levels, then subjects warm up and stretch for 10 minutes before performing tests to avoid unwanted injuries. The treatment is an anaerobic activity that runs 200 m. Before the anaerobic activity of the students is taken preliminary data (Pre-test) in this case is GDA (Random Blood Sugar), then taken again after anaerobic activity for the final data (Post-test). After anaerobic activity, the sample of students in the control group was given 250 ml of drinking water, while in the treatment group was given a drink of sweet orange juice as much as 250 ml.

C. Statistical and analysis

Descriptive statistics were determined for each variable recorded. Data are presented as mean±SD. Normality test to measure whether data obtained has a normal distribution so it can be used in parametric statistics (inferential statistics). Paired t-test and independent t-test was applied for Statistical evaluation of the data generated using SPSS (Statistical package for Social Studies) Version 19.0 Software.

III. RESULT AND DISCUSSION

The result of the research is the measurement data obtained from the research cover the whole variable data that is independent variable, dependent variable, and control variable.

The following descriptive analysis of weight, height, GDA pre-test and post-test GDA data were presented in the table below

The average of the characteristics research according weight and height. Body weight in the control group obtained mean of 66,20 ± 9,841; body weight in the treatment group obtained mean of 60,70 ± 9,476. The height in the control group was 172,00 ± 8,692; height in the treatment group obtained mean of 169,30 ± 5,697. (Table 1).

TABLE 1. CHARACTERISTIC OF THE SUBJECT

Characteristic of the subject	Mean	SD (±)
weight control	66,20	9,841
weight treatment	60,70	9,476
height control	172,00	8,692
height treatment	169,30	5,697

Pre-control sugar levels in the control group were 91.40 ± 4.624; the pre-treatment of sugar in the treatment group was obtained 84.40 ± 7,849 average. Sugar content of post in control group was obtained mean of 99,00 ± 8,994; post-feed sugar content in the treatment group was 106,90 ± 10,016. (Table 2)

TABLE 2. AVERAGE OF BLOOD GLUCOSA LEVEL CONTROL GROUP AND TREATMENT GROUP

Group	Mean	SD (±)
Pre control	66,20	9,841
Pre treatment	60,70	9,476
Post control	172,00	8,692
Post treatment	169,30	5,697

Normality test data are analyzed using the *Shapiro-Wilk Test*. (Table 3) Based on table 2 obtained *pvalue* > 0.05, it means that all of data for glukosa level pre and post are normally distributed.

TABLE 3. NORMALITY TEST

Group	Glukosa (mg/dl)	Level
Pre control	0,510	
Post control	0,609	
Pre treatment	0,818	
Post treatment	0,510	

The result of this research is there is significant difference between pre and post in control group and treatment group that is control group P = 0,016 while treatment group P = 0,001. (Table 4)

TABLE 4. STATISTICAL RESULTS OF INDEPENDENT T-TEST:

Blood Glucosa level	pvalue
Pre	0,016
Post	0,001

This research is a laboratory experimental research, with research design used is pre - posttest group design. Sampling was conducted as many as 20 Students of Faculty of Sport Science who were divided by control group and treatment group, men, age 20-23 years, healthy, and did not take supplements during the study. Both groups were given 200 m sprint sprints. After the 200 m sprint, the control group was given 250 ml of mineral water while the treatment group was given 250 ml of sweet orange juice. In this study examined blood glucose levels before and after sprint activity 200 m.

The result of the mean of pre sugar level in the control group was 91,40 ± 4,624; post-control sugar content in the control group was found to be 99,00 ± 8,994. Paired t-test results obtained significant results between the pre control group and post control group where p = 0.016 <0.05. From the above results in the control group given 250 ml mineral water

drink showed increased glucose levels before and after sprint 200 m run. During physical exercise there will be increased use of muscle glycogen and blood glucose according to the severity of physical activity. In the control group given is mineral water, drinks that contain no carbohydrates or glucose that is only able to maintain body hydration.

The results of this study also show the average increase in the difference between pre and post in both groups. The average increase in the difference in the treatment group was higher than that of the control group, which resulted in the provision of a source of energy for sports activities faster and better.

The mean of pre-sugar content in the treatment group was 84.40 ± 7.849; post-feed sugar content in the treatment group was 106,90 ± 10,016. Paired t-test results showed significant results between the pre-treatment group and the post-treatment group where $p = 0.001 < 0.05$. From the above results in the treatment group given 250 ml sweet orange juice drink showed a significant increase in glucose levels before and after sprint 200 m. The content of carbohydrates or glucose in pacitan sweet orange juice able to keep blood glucose levels so as not below 80 mg/dl. The main purpose of consuming beverages containing carbohydrate after exercise is to maintain the hydration of the body, and able to provide energy source in blood and maintain the glycogen reserves in muscle (Miharja, 2004).

IV. CONCLUSION

Based on the results of the research, it can be concluded that the administration of pacitan sweet orange juice affect blood glucose levels after anaerobic activity.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

Application of SDA-03 (*Softwaredetection Autism-03*) to Detect Autism Children Disabilities in the Early Age

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Abstract—Background of this study is most of parents know their children had autism since in elementary school even junior high school, whereas autism can be detected early, delayed in identificating autism children cause difficult and complicated disease to be cured. The result of this study is software product named SDA-03 which answered 23 questions directed at children to be analyzed, and if the child is identified having autism symptoms then software will automatically give recommendation that child has autism symptoms.

Keywords—autism, disabilities, early age, SDA-03

I. INTRODUCTION

Autism can happen to anyone, regardless of race or family background, such as social status, economic, and education. Autism is a developmental disorder that can be detected early on. Therefore, it is important for parents to be sensitive to any abnormalities that children show in their development so they can be dealt with immediately and reduce the risk of disturbing later developments [7]. The results showed that of a total of 64 autism children who studied, most aged 7-10 years of 30 children. This disorder is more common in men (59.6%) than women (40.4%) [4].

According to Rini [17]. Research in Banyumas Regency Most of the growth of toddlers (83% of respondents) is normal. Most childhood development (83%) according to age. Eighty-eight percent (88.7%) or most toddlers have no emotional mental problems. The majority of respondents also had low risk of autism which was 50 respondents (94.3%), and most respondents did not have attention concentration and hyperactivity disorder as many as 48 respondents (90.6%).

SLB C Semarang is the educational foundation for children with special needs which is located on Alfa Raya Street Number 3 Perum Alfa Permai, Klipang, Semarang Central Java. The number of students who have autism disorder in this school became special attention for the writer to create an application program that can detect early for children with this disorder. According to Leo Kanner [6]. one factor that causes autism is a genetic factor. One third of family autism member have disorders, that is if their parents have autism, the risk of 60% children with autism, on the twins if one has autism then 70-80% of his brother has autism.It is confirmed that if the child has autism disorder, then the parents have congenital / carrier autism in their children.It is indicated that parents in SLB C Semarang could also lose the autism disorder to their other children or in the other words, children who have autism disorder at SLB in the Semarang City, her siblings could also have similar disorder.

Early detection of autism, followed by appropriate interventions or corrective actions will largely determine future and future child development. There are several things to note because it may indicate a developmental disorder, including symptoms of autism. If the child does not get autism autism treatment, the condition of autism will be permanent [11]. Do not let the child lose the golden age to grow and develop optimally the presence of late detected autism disorder until intervention was delayed too late and the problems faced by children more difficult to decompose. Finally the future of the child is at stake.

Seeing the problems above, the researcher is interested in making a product in the form of an application called "Software Detection of Autism-03", here the application contains of software that can detect children in the early age who have disorder or autism symptoms.

Meanwhile, Application according to *Indonesia Dictionary* [2]. "Application is the implementation of system design to process data that uses a rules or provisions of a specific programming language". In terms of application is a ready-made program that created to perform a function for users or other application and it can be used by the intended target.

The range of children in the early age according to Article 28 of UU Sisdiknas Number 20 year 2003 paragraph 1 is 0-6 years. Meanwhile, according to scientific study of PAUD and its implementation in some countries, PAUD is conducted since age of 0-8 years. From the explanations above and refer to this study, it can be concluded that children's age which referred in this study are children in age of 1-3 years.

The Novelty of Research Results

This study was designed on the basis of previous research, the following are previous research became a benchmark in designing this study:

1. The research of Diane L. Robins el.at. It used M-Chat method (*The Modifed Cheklist for Autism in Toddler*) is a list or checklist containing some questions to detect autism on child in age of 16-30 months. M-Chat was developed by Diane L. Robins ect. in the form of written questions in checklist.
2. The research of WHO in 1993, used the checklist contained in the ICD-10(International Classification of Diseases-10) is an autism diagnosis system established by WHO.
3. The research of DSM-IV in 1994. Besides WHO, United States Psikatri Association also compiled the outline as a guide to establish autism, called DSM-IV (Diagnostic Statistical Manual). Basically, diagnosis of autism are enforced based on ICD-10 and DSM-IV indicated the same criteria.
4. CARS (*Childhood Autism Rating Scala*),is a scale rating of childhood autism. CARS was made in the early 1970 by Eric Schopler [10], which is based on behavioral observation. The tool used scale up to 15 children evaluated based on its relationships with the people, the use of body movements, adaptation to change, listening ability as well as verbal communication.
5. *The Autisme Screening Questionere* [9], is the checklist consist of 40 scale items, which are used for children in age 4 years to evaluate their communication and social ability.
6. *The Screening Test for Autism in Two-Years Old* (STAT), is a screening autism test for age 2 years. This screening test was developed by Wendy Stone based on 3 areas of the child's ability, which is play, motor imitation, and concentration.
7. Sri Muji Rahayu [10]. Handling children with autism if handled faster, the faster the handling. And children with autism can be detected before the child reaches the age of 3 years.
8. Aji Setiawan [1]. Autistic Child Detection Expert System is made so that parents can get information quickly and accurately so that it can recognize the symptoms - symptoms of autism and able to handle it yourself without having to meet with experts directly.
9. Arie Qur'ani [12], Symptoms of autism can be detected early through interference seen in aspects of behavior, communication, and interaction from the age of 4 months.
10. Yoanita [13]. The classification system is using Naïve Bayes method by comparing the probability result for each three category (aloof, passive, active but odd). For Naïve Bayes's weakness is solved by add-one smoothing method so that the probability of Naïve Bayes to a target based on the existing symptoms.
11. Siti Nurul Khofiyah [14]. In his research produced the software Detection of autism in children. This system is able to detect as many as 5 disorders accompanied by symptoms of disorders, causes, suggestions and the value of certainty from the results of detection. The results of tests conducted directly on the expert child and user, indicating that the application is feasible and usable.
12. Edwar Budiman [15]. Autism is divided into three types of autism class mild, moderate, and severe according to the condition of people with autism. In doing detection of autism it can use linear discriminant analysis (LDA) method to get good accuracy result. Using 75 training data, the system can produce an accuracy of 88%.
13. Hendita Artha Kusuma [16]. In the Autism Identification System has the ability to identify autism for children aged less than 8 months to 5 years, which can help parents to make early diagnosis. In addition Psychiatrists can use this system to make it easier to identify autism quickly.
14. Suryaningrum [18]. Based on the results of the study it can be concluded that as many as 7 respondents (3%) know the Children Needs Special assessment and as many as 242 respondents (97%) did not know the assessment for the crew. In addition, the problems of early childhood teachers are difficult to make early detection when entering early childhood and have difficulty to communicate with parents, not understand how to handle ABK, and the difficulties of children crew enter school to the next level.
15. Gusti [19]. The results of this study is to create an application that aims to facilitate parents diagnose children with symptoms of autism.
16. Budiyanto [20]. Naïve Bayes Method is the method for this expert system. The methods willdiagnose the children with autism and classify the autism categories to be low autism,medium autism, or high autism. There are 33 autism symptoms that the systems willprocess it. After being tested, the expert systems can diagnose children with autism thesame as the expert's (psychologist) diagnose.

In the application of SDA-03 developed by researcher, researcher tried to enhance the research that has been done in previous studies, in order to give a better color by modifying and adding some items. Application of SDA-03 is basically almost same with other research, but the difference is in manual system became computerized system. In the previous product used manual system in the form of question or cheklist. SDA-03 products is product or Software created by way of answering the question "yes" or "no" that consists of 23 questions listed in the program then the conclusion will be drawn automatically whether the child contracted autism symptoms or not. This application is to detect children with symptoms of autism at the age of 1-3 years.The technical operation of SDA-03 application is

parents or teachers give answers to the questions in the application which are integrated based on observations made on daily children's behavior.

II. MATERIALS AND METHOD

This type of research in this first stage is quantitative research where the developed product would be seen its effectiveness. Software Detection system of Autism-03 uses waterfall method, which consists of: *1) analysis, 2) design, 3) cooding, 4) testing/verivication, 5) maintenance.*

This research is developmental research or research and development. Developmental resarch is research that aims to develop new products or refine existing products. The steps of this developmental research by using Borg & Gall models [3].

The technique used by purposive sampling is by determining the sample based on predetermined criteria of SLB C children with autism disorder.

After doing the analysis, so the researcher conducts the developmental model or product by doing test that have been compiled before. After the model is created then the next step is a test of the variables which already determined by researcher in order to ensure the success of the product that would be created.

Small-scale trials are conducted at SLB Pekalongan with 15 parents of children with autism children, and large-scale trials are conducted at SLB C Semarang with 52 parents. The researcher get those samples from recommendation of his friends who work in both of that schools.

After the variables tested, the variables are analyzed and validated from three experts; psychologists, occupational therapists for children with special needs (ABK) and expert of practitioners adaptive of physical education. In addition, components of the test results are also analyzed by using statistical analysis of T-test and F-test. The features of Software Detection of Autism-03, that are:1) able to detect children with autism using a questionnaire, 2) Accommodates the data results of the questionnaire, 3) parents could assess in many times

III. RESULT AND DISCUSSION

Software Detection of Autism-03 is web-based application that is used to detect children autism early. Autism is a mental disorder that is quite difficult to identify, for it is by using a web-based identification system that can help parents to identify autism in children as early as possible so that parents are not wrong in handling [5].

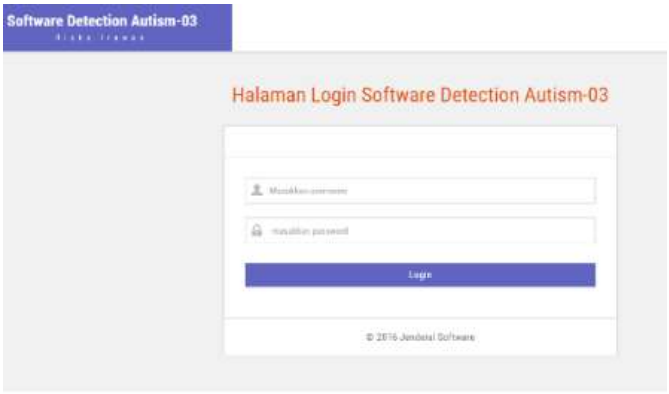

Fig 1. Front Page of*Software Detection Autism-03*

Software Detection of Autism-03 web-based and also mobile is system that is built with web-based technology and also mobile, now to be able in accessing this system, the visitors can access by using web address: http://smanbanyumas.net/pakar and on android mobile phone uses Software Detection of Autism-03 in apk format.

TABLE 1.THE USER OF SOFTWARE DETECTION AUTISM-03

No	*User*	Needs
1	Admin	- Login to system - View the questionnaire results - Input of the user data - Update the user data - Delete the user data - Search the user data - Input the category data - Update the category data - Delete the category data - Search the category data - Input the question data - Update the question data - Delete the question data - Search the question data - View the questionnaire format - Update data on system - Logout from system

2	Parent/ Teacher	- Login to system - View the questionnaire results - Conduct a questionnaire either new or reconfigured - Logout from system

The question instrument consists of 23 items, where in the autism diagnosis can be enforced if there is minimum number of symptoms of three (3) wrong answers. It mean three answers identified have autism disorder. Table 3 shows the indicators/questions of Software Detection Autism-03 application.

TABLE 2.QUESTIONS INSTRUMENT OF SOFTWARE DETECTION AUTISM-03

No	Question	Yes	No
1	Does child like to play with his friends?	v	
2	Does child like cuddled or swung?	v	
3	Does child like to climb(stairs, chair, or table)?	v	
4	Does child like cilukba game?	v	
5	Does child ever talk to the doll, become a specific figure, or talk in telephone?	v	
6	Does child ever use the forefinger when he/she wants something?	v	
7	Does child did not dropped away when given toys?	v	
8	Does child ever bring objects and shown to you?	v	
9	Does child see your eyes 1 or 2 seconds when invited to joke?	v	
10	Does child smile when you invite him/her to smile?	v	
11	Does child imitate you if you make some specific face?	v	
12	Does child give reaction if his/her name is called?	v	
13	Does child respond when you pointed a toy in a particular side of the room?	v	
14	Does child in age 2,5 years can able to walk?	v	
15	Does child look at things you look?	v	
16	Does child trying to find your attention to the activity he/she is doing?	v	
17	Does child understand to what the other said?	v	
18	Does the child look at your face (want to see your reaction) when faced with an unfamiliar situation or he/she does not understand	v	
19	Does child refuse to be hugged?		v
20	Does child can not play with peers?		v
21	Does child like stuffed toys to his/her mouth?		v
22	Does the child did not look when it is invoked (ignorant) cry and laugh for no reason?		v
23	Does the child less vivid expression?		v
	AUTISM DIAGNOSIS CAN BE ENFORCED IF ALL THE MINIMUM NUMBER OF SYMPTOMS IS 3		

IV. CONCLUSION

A. Conclusion

Based on the results above, it can be concluded that Software Detection of Autism-03 is an easy and effective media to be used by parents and teachers to detect autism children since early age of 1-3 years. It can be used in android application.

B. Suggestion

Parents should consult to a doctor, specialist or psychologist if their children are identified autism symptoms as soon as possible and should do Prevention of autism children as early as possible in order to provide positive intevention so that in the future the growth and their development could be optimized.

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Intake of Sugar-Sweetened Beverage and Metabolic Syndrome Components in Adolescents

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***Abstract*—Adolescents with metabolic syndrome have a higher risk for cardiovascular diseases and diabetes. Risk factors of metabolic syndrome include central obesity, hypertriglycerid, and hyperglycemia. High intake (>50 g/day) of sugar-sweetened beverages (SSBs) is known to be positively associated with increased waist circumference, triglyceride and fasting blood glucose levels. This study aimed to analyze the relationship between SSBs intake with waist circumference, triglyceride and fasting blood glucose levels in adolescents. This study was a cross-sectional design with fifty-nine subjects of adolescents aged 15-18 years old. They were performed by simple random sampling technique. SSBs and energy intake were assessed with Semi Quantitative Food Frequency Questionnaire, while waist circumference used a tape measure. Blood glucose levels were measured with Glucose Oxidation method, triglyceride levels using colorimetric enzymatic method (GPO-PAP). Data were analyzed by Person Product Moment and Rank Spearman correlation test. High triglyceride levels were observed in 62.7% subjects and total of 44.11% subjects had large waist circumference. Excessive intake of SSB was found in 72.9% subjects. Intake of SSBs was correlated with waist circumference (p=0.020) and triglyceride levels (p=0.044), but not fasting blood glucose levels (p=0.060). Consumption of SSBs > 50 g/day can increased waist circumference and triglyceride levels that were component of metabolic syndrome.**

Keywords— Sugar-Sweetened Beverage, Metabolic Syndrome, Adolescents

I. INTRODUCTION

Metabolic syndrome is a metabolic disorder which increase cardiovascular diseases and diabetes mellitus. The components of metabolic syndrome are central obesity, the increase of triglyceride level and fasting blood glucose, HDL level decrease and also high blood pressure [1]. The increase of metabolic syndrome prevalence on adolescents in line with the increase of obesity prevalence as one or the risk of metabolic syndrome [2]. Based on study result in Semarang city in 2015 showed that the prevalence of metabolic syndrome in obese adolescents as 68.4% [3]. The research conducted in senior high school students in 2016 showed that from 66 obese adolescents, there were 47.5% has metabolic syndrome [4].

Obesity is the main trigger of metabolic syndrome, because excess calorie intake from carbohydrate, fat, and protein more than total energy needed [5]. The excess energy will be convert into fat and stored in adipose tissue which will increase waist circumference [6]. Adolescents with central obesity has waist circumference for more than 80th percentile. Obesity can trigger the increase of triglyceride by excess fat storing. Triglyceride accumulation in hepar can cause insulin resistance which will increase fasting blood glucose [3].

Consumption SSBs increases on adolescents because it is affected by several factors, those are: advertisements broadcasted in media, peer group influences, and distribution of SSBs in accessible cafeteria or supermarket [7], [8]. Sugar-sweetened beverage is a beverage of which has been added calorie sweetener into it, such as soft drink, sport drink, fruit drink, energized drink, tea and coffee, milk, fruit juice, and isotonic beverage [9]. Based on the study of cohort conducted on adolescents showed that the consumption of SSBs for 375 ml which contain sugar approximately 37-54 g contribute energy as 150 calories which related to the increase of metabolic syndrome risk [10], [11]. The additional sugar content in SSBs contributes energy as 21.2% on adolescents which can increase obesity Excess energy in the body will be stored in a form of triglyceride in depose tissue which lead to obesity if it is occur continuously [12], [13]. The study on female adolescents aged 12-19 showed the consumption of SSBs 250g/day will lead to the increase of triglyceride as 2,3mg/dL [14]. Another study stated that the consumption of SSBs > 1 portion/ day can increase the prevalence of diabetes mellitus type 2 as 26% [15]. Based on the background the author interested to analyze the correlation of SSBs intake with waist circumference, triglyceride and fasting blood glucose on adolescents.

II. MATERIALS AND METHODS

This study used a cross sectional design with data collecting on July until August 2017. This study was

conducted on students in SMA Negeri 15 semarang. The selection of 59 subjects was performed by simple random sampling technique. Data on age, subjects identity, antropometri, sugar sweetened beverage (SSBs) intake, energy intake, waist circumference, triglyceride levels, and fasting blood glucose levels.

Waist circumference was the circle line of a waist right on navel measured through the middle of lowest interior edge with crista iliaca. The category of central obese waist circumference if the waist circumference was more than 80 cm and normal if it less than 80. Fasting blood glucose levels (GDP) are a parameter that describes the glucose concentration in the blood plasma measured in subjects who were fasting for 8-12 hours. GDP levels were measured using spectophotometry by the Glucose Oxidation (GOD) method. GDP levels are considered to be high if it is ≥100 mg / dL and normal if it is ≤100 mg / dL. Triglyceride was one of the fats in the bloodstream that come from fat intake and were formed in the liver. Triglyceride levels were measured by enzymatic colorimetric using glycerol phosphate oxidase (GPO). Triglyceride levels was considered high if it was ≥110 mg /dL and normal if it is <110 mg/dL [16].

Sugar-sweetened beverage intake was the average of sugar from packaged and non-packaged beverages. Packaged beverages are processed drinks containing additional sugars recorded on the nutritional fact label on the packaging, whereas non-packaged beverages are sugar-added drinks during brewing and are not recorded on the nutritional fact label on the packaging. Sugar was calculated from the sugar content contained on the package and added sugar during brewing. Measurement of SSBs intake was obtained by semi quantitative consumption frequency method with frequency question of consumption in a day, week, month, and year and the amount of each time consumption was recorded in household size (URT) and converted to gram. The intake of SSBs was classified as high if it contains sugar ≥50 g / day and as normal if it was<50 g / day [17]. The energy of SSBs intake was categorized to be high if it was ≥10% of total energy intake and as a normal if it was<10% of total energy intake [18]. Data of energy intake obtained by interview using Semi Quantitative Food Frequency Questionnaire (SQ-FFQ). Energy requirements were calculated based on individual needs and then the energy intake was grouped into the adequacy level based on the National Widyakarya Food and Nutrition (WNPG) 2012. The intake of ≥120% of individual needs was categorized as high, 90-119% is sufficient, and <90% is less. Data were analyzed by Person Product Moment and Rank Spearman correlation test. Data analysis using SPSS with 95% confidence degree ($\alpha = 0,05$).

III. Results and Discussions

The subjects aged 15-18 years old including 35 (60%) were female subject and 24 (40%) male subject. The results in Table 1 show that the average age of the subjects was 16.2 years old and there were subjects with z-score of body mass index for age of 4.9 SD who fall into the obesity category.

Table 1: Characteristic of Subject

Variables	Minimum	Maximum	Mean+DS
Age (years)	15	18	16,2±0,7
Height (cm)	145,0	183,0	160,2±7,4
Weight (kg)	35,9	141,0	63,2±19,1
BMI/age (SD)	-2,7	4,9	0,7±1,5
Intake of SSBs (g/day)	11,8	236,2	92,5±60,8
SSBs packaging (g/day)	4,6	198,2	62,1±46,3
SSBs non-packaging (g/day)	1,7	89,6	30,3±25,2
Energy Intake of SSBs (kcal/day)	72,4	1516,0	520,5±328,3
Energy Intake of SSBs (% Energy)	3	41,2	19,2±8,7
Energy Intake (kcal/day)	1171,9	6327,7	2707,2±1037,9
Waist circumference (cm)	56,5	114,7	79,9±12,6
Triglyceride (mg/dL)	96,0	150,0	113,9±10,3
Fasting Blood Glucose Levels (mg/dL)	70,0	98,0	81,5±7,6

The intake of sugar-sweetened beverage subjects ranged from 11.8-236.2 g/day with an average SSBs intake greater than non-packaged beverage, i.e. 62.1 g/day and 30.3 g/day. While the mean SSBs intake of 92.5 g/day, which means the consumption of SSBs in the subject tends to be high. The mean triglyceride and fasting blood glucose levels were 113.9 mg/dL and 81.5 mg/dL, respectively, high triglycerides and normal at fasting blood glucose levels.

Table 2 shows that 72,9% subjects were high intake of SSB, but subjects with sufficient energy intakes were only 28.8%, but 91.5% of subjects took energy from a high sugar-sweetened beverage (> 10% of total energy). The high intake of sugar-sweetened beverage is in line with energy intake in the subject, where found in 49.2% of subjects who have higher energy intake. The average total SSBs intake was ± 19.2% of total energy intake.

Table 2. Characteristics of *Sugar-Sweetened Beverage* and Energy Intakes

Category of SSBs and energy inatake	Sex		Total n (%)
	Male n (%)	Female n (%)	
Sugar Sweetened Beverage (g)			
Sufficient	6 (10,2)	10 (16,9)	16(27,1)
High	18 (30,5)	25 (42,4)	43(72,9)
Energy intake from SSBs (%)			
Sufficient	1 (1,7)	4 (6,8)	5 (8,5)
High	23 (39,0)	31 (52,5)	54 (91,5)
Energy intake (%)			
Less	7 (11,9)	6 (10,2)	13(22,1)
Sufficient	8 (13,5)	9 (15,3)	17(28,8)
High	9 (15,3)	20 (33,9)	29(49,2)

This result is greater than the results of a survey conducted by Centers for Disease Control and Prevention (CDC) in children and adolescents in the United States in 2005-2008, the average intake of sugar from foods and beverages by 16% of total energy intake [19]. The study conducted on adolescents aged 12-14 years old in 2014 stated that the average sugar consumption in beverages sweetened was 60.43 g (19.04% of total energy) [20]. In fact, the suggestion of 50-60% of energy needs obtained from sources of carbohydrates, both complex and simple. However, according to Tumpeng Gizi Seimbang (TGS) Indonesia, the greatest fulfillment of needs is derived from complex carbohydrate sources, such as whole grains, cereals, various

tubers and their processed products. Whereas simple carbohydrate fulfillment is limited for no more than 50 g/day or <10% of total energy intake [17] [18] [21].

Sugar-sweetened beverage consumption that tends to be high in adolescents is affected by several factors, such as advertisements that are widely broadcasted in the media, the distribution of SSBs in cafeterias or accessible supermarkets, as well as the influenced by peers. The choice of baverage and eating habits on adolescents is influenced by peer because it is considered as the solidarity of the peers [7] [8]. The most commonly consumed type of SSBs was the type of package beverage, which is tea, milk drinks, fruit drinks, and soft drinks which contribute an average of sugar 20-46 g/package as well as non-packaged beverages such as tea and various kinds of ice that has average sugar content of 22-26 g/serving or equivalent to ± 2 tbsp sugar.

Table 3 shows that 14 subjects were classified as obese based on body mass index for age, meanwhile 44.1 % subjects were abdominal obesity, 62.7% of subjects had hypertriglyceride and 44.1% subjects had central obesity. The prevalence of obesity in this study was higher than that of the study in 2016, which was 12.8% [4]. The increased of obesity, especially central obesity is closely related to the incidence of metabolic syndrome. Adolescents who fulfill two components of the metabolic syndrome include pre-metabolic syndrome, most of which already occur in the subject, including high waist circumference and high triglyceride levels. Adolescents with pre-metabolic syndrome are at greater risk for becoming metabolic syndrome than with normal adolescents [22]. Subjects classified as central obese (≥80th percentile) was 44.1%, with female subjects as (28.8%) was greater than female (15.3%).

Table 3. Nutritional status, and component of metabolic syndrome in subjects

Metabolic syndrome components	Sex		Total n (%)
	Male n (%)	Female n (%)	
Nutritional status			
Thin	-	2 (3,4)	2 (3,4)
Normal	13 (22,0)	21 (35,6)	34 (57,6)
Overweight	3 (5,1)	6 (10,2)	9 (15,3)
Obese	8 (13,5)	6 (10,2)	14 (23,7)
Waist circumference (cm)			
Normal (< persentil 80)	15 (25,4)	18 (30,5)	33 (55,9)
Abdominal obesity (≥ persentil 80)	9 (15,3)	17 (28,8)	26 (44,1)
Fasting Blood Glucose Levels (mg/dL)	24 (40,7)	35 (59,3)	59 (100)
Normal (<100 mg/dL)			
Triglyceride Levels (mg/dL)			
Normal (<110 mg/dL)	8 (13,6)	14 (23,7)	22 (37,3)
High (≥110 mg/dL)	16 (27,1)	21 (35,6)	37 (62,7)

This result is in accordance with the study of 13-15 years old adolescents in Semarang which stated that the incidence of central obesity in female is greater than male that were 52.6% and 38.6% [3]. This is because female body fat composition is greater than male, ranging from 21-35% as well as women's physical activity tend to be lower than men, so that the excess energy consumed more easily converted into fat and accumulate faster [23].

Central obesity in individuals due to body fat stores and intra-abdominal fat is closely related to metabolic abnormalities and cardiovascular disease [24]. Adipose tissue is a tissue that plays an active role in the release of free fat and pro and anti-inflammatory cytokines, so that obese individuals tend to experience cholesterol homeostasis disorders, which one of which was elevated triglyceride levels [25]. In this study there were subjects with hypertriglyceride of 62.7%. This number is higher than the research in 2016, which is 37.5% [4]. The increase of components of the metabolic syndrome, one of which is obesity in adolescence occurs due to many factors, one of which is excessive food intake and low physical activity.

The Correlation of SSBs and energy intake with Metabolic Syndrome Components

Table 4 shows that there was significant correlation between SSBs intake with waist circumference (p = 0.015) and triglyceride levels (p = 0.044), as well as energy intake (p = 0.014) with triglyceride levels on adolescents. But there was no significant correlation of SSBs intake with fasting blood glucose levels in adolescents (p = 0.06).

Table 4. Sugar-Sweetened Beverage Intake with Waist circumference, Triglyceride Levels, and Fasting Blood Glucose Levels

Variabel	Waist circumference		Triglyceride Levels		Fasting Blood Glucose Levels	
	r	*p*	r	*p*	r	*p*
Intake of *Sugar Sweetened Beverage* (SSBs) (g)	0,302	0,020[a]	0,264	0,044[a]	0,246	0,060[a]
Energy (kcal)	0,208	0,113[b]	0,318	0,014[b]	0,043	0,745[b]

[a] *Rank-Spearman* [b] *Pearson correlation*

This result same with study conducted on adolescents aged 12-16 in Taiwan who stated that SSBs intake associated with an increased component of the metabolic syndrome [14].

Sugar-sweetened beverage can increase waist circumference because the excess energy from SSBswill be stored in a form of fat inside of body and then it was stored as energy storage in diposa tissue. After that the energy intake from sugar-sweetened beverage is known as liquid form which does not give the effect of full in stomach compare to solid food, therefore will increase excess energy intake. In addition, the fructose content in Sugar-sweetened beverage does not stimulate leptin, hence people who consume high fructose will complain to be hungry faster and eat excessively which will increase the fat accumulation intra abdominal over weight [26] [27]. This is in line with the study conducted to children aged 3-11 years old in England in 2004 and adolescents 12-18 years old in Taiwan in 2014 that high intake of SSBs can increased Body mass Index (BMI) and waist circumference [14] [28]. The increase of triglyceride levels may occur due to the fructose content present in SSBs. As much as 60% of the carbohydrates used as sweeteners in SSBs are fructose that will largely be metabolized in the liver. The first working enzyme is fructokinase or ketoheksokinase (KHK-C) using adenosine tri phosphate (ATP) to phosphorylate fructose to fructose -1

phosphate. Then the fructose-1 phosphate was converted to dihydroxyacetone phosphate and glyceraldehyde 3-phosphate which is the material to form glycerol 3-phosphate and acetyl-KoA. Furthermore, acetyl-KoA was converted to acyl-KoA which binds to glycerol-3 phosphate to form triacyl glycerol or triglyceride. The cross-sectional study of adolescents in the UK in 2011 suggests that consuming high intake SSBs may increase triglyceride levels as well as the risk of cardiovascular disease [29]. A cohort study in children aged 8-15 years also mentions that the intake of SSBs was positively associated with triglyceride levels [30].

This study showed that no correlation of SSBs intake with fasting blood glucose levels in adolescents ($p > 0.05$). These results are supported by study conducted on obese adolescets showing no association between intake of sweet beverage with fasting blood glucose levels [31]. The absence of sugar-sweetened beverage intake link with fasting blood glucose levels in this study because all subjects had fasting blood glucose levels in the normal category, so it cannot give an idea of the relationship of SSBs intake with fasting blood glucose levels. This result is supported by a Brazilian study in 2013 which states that hyperglycemia in adolescents has the smallest percentage, which is 2% [32]. Moreover, fasting blood glucose indicator is more describing if it was conducted on subjects with overweight conditions, has a family history of type 2 diabetes mellitus, and have signs of insulin resistance or conditions associated with insulin resistance [33]. The normal fasting blood glucose levels in adolescents show because the body's compensating system is still good so the body can maintain normal blood glucose levels through the hormone insulin secreted by the pancreas [34]. Based on the correlation test, the intake of SSBs showed a positive correlation with fasting blood glucose, which means higher SSBs intake then fasting blood glucose level will be higher. This is in line with a cross-sectional study conducted on children and adolescents claiming that sugar intake from beverages can increase fasting blood glucose levels [11] [35]. Sugar-sweetened beverage contains more easily absorbed simple carbohydrates such as sucrose fructose corn syrup (HFCS) on a high-glycemic index diet which would then increase appetite. and weight gain associated with the development of glucose intolerance and insulin resistance [36]. In addition, the fructose used as a sweetener in SSBsalso contributes to the failure of glucose tolerance and insulin resistance through the mechanism of de novo lipogenesis (DNL). Fructose induces DNL by providing carbon atoms (glycerol 3 phosphate and acyl-KoA) converted into monoacylglycerol and diacylglycerol (DAG) which were subsequently converted to triglycerides. The accumulation of triglycerides in the liver will result in insulin resistance [37].

IV. Conclusion

Most of the subjects in this study had a high energy eating habits (49.2%), and consumed a high sugar beverage (72.9%). The average sugar intake in drinks reached 92.5 g/day (19.2% of total energy). So that found 44.1% subjects have experienced central obesity and 62.7% have hyper triglyceride which is a component of metabolic syndrome. Adolescents need to be educated regarding the limit of consuming SSBs maximum 250-350 mL/day or additional sugar to foods and beverage <50 g/day (<4 tbsp/day) and offset by physical activity for achieving an energy balance and lowering the risk of metabolic syndrome.

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The Impact of Industrial Noise Exposure on Hearing Loss and Hypertension Decline of Labour in Central Java

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***Abstract*—Noise is the danger factor that influences all environment, both industrial environment and environment in general. The effect of noise can be a disturbance sense of hearing form of deafness. For examples is the lowering percentage of hearing level and for another impact is on hypertension. This study aimed on determining the effect of age and the tenure (work period) on hearing loss and hypertension of the laborer exposed to an industrial noise. This study used observational and analytical method with cross sectional approach. The populations were the laborer exposed to the textile industrial noise in Subosukawonosraten region of Central Java. The samples were taken through quota sampling technique from 210 people. The results have shown that the laborer exposed to the noise by intensity of 80-99 dB have been found that: 1) there is an effect of age and tenure (work period) on the percentage of hearing loss, 2) there is an influence of age and tenure (work period) towards the hypertension of the laborer. It is concluded that the noise in the intensity of 80-99 dB affects the hearing loss and hypertension of laborer.**

Keywords—noise, hearing loss, hypertension, textile industrial

I. INTRODUCTION

In 2005, WHO released"Sound Hearing Program 2030", which hasa mission to reduce hearing loss disturbance in 2030 through the development of a sustainable health system. The target is to reduce hearing loss disturbance by 50% in 2015 and 90% in 2030 [1]. Furthermore, [1] states that the purpose of the development is to produce Indonesian people who are intelligent, critical, and productive; the sense of hearing is an essential part in creating a productive person. When a person has a lowering percentage in hearing level, the quality of life will decline too. Thus, the problem of hearing level is essential for both personal life, community and within countries.

A disorder as mentioned above is anauditory disorder, while non auditory disorders include disorders of communication, psychology and balance [2]. A high noise will cause cardiovascular disorders, allergies, and sore throat [3]. The finding of this study shows that a high noise can increase blood pressure. There is a difference between blood pressure in a high noise and low noise. This occurs because of stress from the effects of noise. A labour who has worked in the environment that has high noise levels sometimes will have an impact on the psychology, one of which is stress. Based on the data processing, namely noise intensity obtained 108.62 dBA on diesel unit on the 1st floor and 106.99 dBA on the 2nd floor, while the Boiler unit 1 intensity noise was 92.53 dBA and 93.99 dBA at Boiler unit 2. the perceived impact of noise experienced by workers as a result of that communication disorders, hearing/auditory and psychological disorders [4]. Besides, noise can also cause anxiety. Anxiety will have an influence on physiology (heartbeat) and will eventually raise blood pressure of someone. there was significant affect of noise to sistole blood pressure (sig.α= 0,039<0,05) and diastole blood pressure (sig.α = 0,019<0,05) [5]. Communities in the region of Central Java exposed to noise at various places are the labour in the textile industry, communities around the textile industry, as well as.

The people who live around the flow of traffic such as airports and highways. The research on the impact of noise around the highway in Yogyakarta [6], shows that there is a relation between noise intensity and the increase of diastolic blood pressure (p= 0. 019), whereas at the level of deafness occurs a significant increasing (p =0.026). The relationship between the noise with hearing impairment workers can be

seen from several factors, including: the intensity of the noise, the results of audiometric tests, age, and tenure [7], demonstrates that there is a relationship between the noise intensity and the increase of diastole blood pressure (p =0.001). This study will examine further about the magnitude of the noise impact of the labour, as well as the policy control that must be done by the government a cross the sectors.

II. MATERIALS AND METHODS

This study used analytical survey with cross sectional method, conducted in Subosukawonosraten (Surakarta, Boyolali, Sukoharjo, Karanganyar, Wonogiri, Sragen and Klaten), Central Java, Indonesia. The populations in this study werethe labour exposed to noisy industry in the region of Central Java Subosukawonosraten (7 clusters). The sample was taken by quota sampling technique. For each cluster, it took 30 people. The total number of samples = 30 x 7 = 210 people. However, this study found some invalid data as many as 190 people.The research instrument: a) Sound level meter, to measure the intensity of noiseb) Audiometer, to measure the value of the hearing level in the sense of hearing c) Tensimeter, to measure blood pressure d) Data of staffing firm, to determine the service life of the labour e) Identity Card (ID), to determine the age of the labour f) Questionnaire, to determine the research supporting data.

III. RESULT AND DISCUSSION

The characteristics ofresearch sample are described based on age and the tenure (working period) and it is shown in Figure1. The figure shows the research sample characteristics ofthe labourer (190 women).

Result of the study showed the age of labor in category <40 years old is 61% and > 40 years old is 39%. While for tge working time as showed as pic 1:

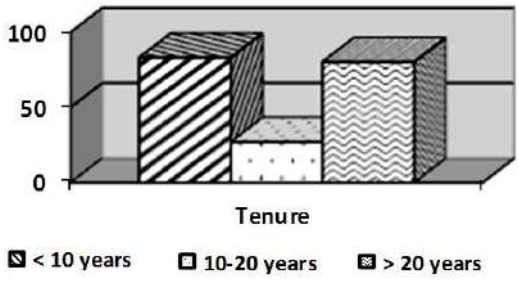

Fig. 1. The Characteristics of Research Sample (Tenure)

Based on the picture 1 showed that most of labor working less than 10 years (83%)

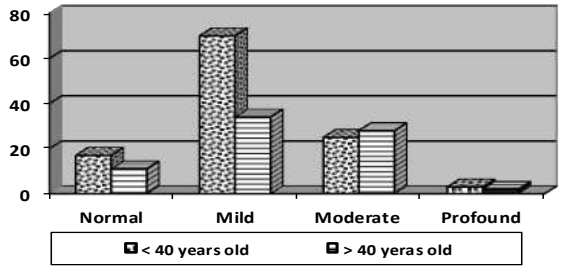

Fig. 2. The Measurements Result of Right Ear Hearing loss by Age of Labourer

The statistical test result using Chi Square Testin figure 2, shows the value of X2=5.96 at p=0.114. Thus, it can be stated the test result is not significant. It can be stated that there is no significant relation between age and the level of deafness of the righ tear.

A. *The Relationship Between Age and Hearing Loss of The Left Ear*

The figure 3 shows that the statistical test by using Chi Square Test, the value of X2=8.81 at p=0.032. Thus, it can be stated that the test result is significant, and so it can be stated that there is a significant relation between age and the level of deafness of the left ear.

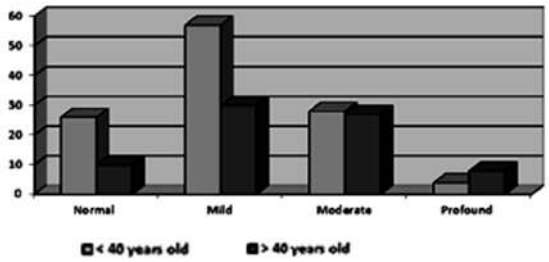

Fig. 3. The Measurements Result of Left Ear Hearingloss by Age of the Labourer.

B. *Relationship Between Tenure (Work Period) and The Right Ear Hearing Loss of The Labourer.*

In the figure 4, the statistical test using Chi Square test shows the value of X2 = 28, 63 at p = 0.000. Thus, it can be stated test result is significant, and so it can be stated that there is a significant relation between tenure work periodand the level of deafness in the right ear.

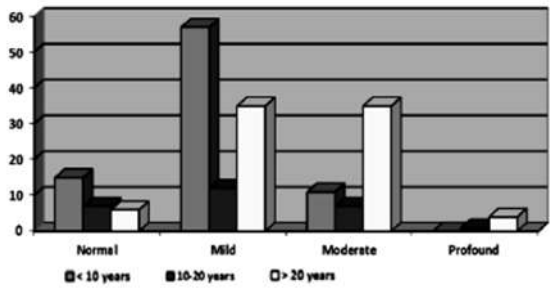

Fig. 4. The Measurements Result of the right ear hearing loss by tenure of the labourer.

C. The Relationship Between Tenure and Left Ear Hearing Loss of The Labourer.

In The Figure 5, the statistical test using Chi Square test shows the value of X2 = 38.40, p = 0.000. Thus, it that test result is significant, and so it can be stated that there is a significant relation between tenure and the level of deafness in the left ear.

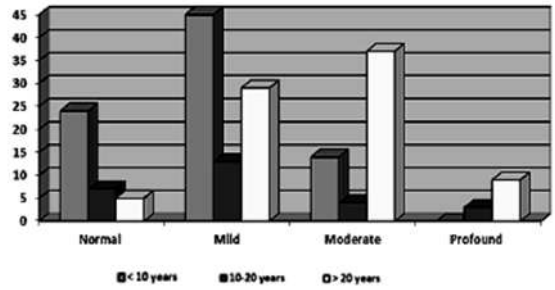

Fig. 5. The Measurement Result of left ear hearing loss by tenure of the labourer

D. The relationship between age and blood pressure of the laboureris.

The Measurement Result of blood pressure by age of the labourer that The labor in the age <40 years old is more (53,9%) than the age above 40 years old. Meanwhile the labor who has a hypotension in the age <40 years old is more (33%) than the age >40 years old and the labor who has a hypotension in the age <40 years old is more (13%) than the age >40 years old.

The statistical test result using Chi Square test shows the value of X2 = 30. 34 at p = 0, 000. Thus, it that the test result is significant, and so it can be stated that there is a significant relation between age and hypertensions.

E. The Relationship between tenure and blood pressure of the labourer is presented in the figure 8.

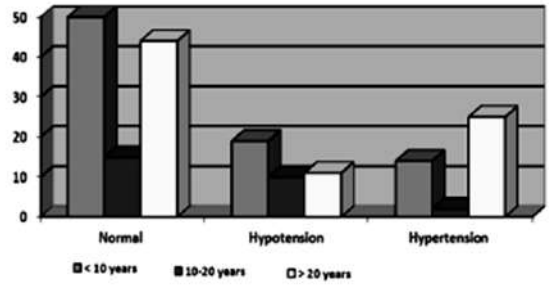

Fig. 6. The Measurement Result of blood pressure by tenure of the labourer.

The figure 6 shows that the statistical test by using Chi Square test values obtains X2 = 12, 48 at p = 0.014. Thus, it can be stated that thetest result is significant, and so it can be stated that there is a relationship between age and hypertension.

a. The relationship between age and the lowering percentage in hearing level of all labourer who are exposed to noise in a company (190 people). In table 8, it can be seen the description of age and the lowering percentage in hearing level of all labourer exposed to noise in a company (190 people).

TABLE 1. THE LOWERING PERCENTAGE IN HEARING LEVEL OF ALL LABOURER EXPOSED TO NOISE IN A COMPANY (190 PEOPLE)

No.	Variable	Average	Deviation Standard	Min	Max	R	p
1.	Age (year)	35.99	9.36	17	60		
2.	% Lowering percentage in hearing level of Right Ear	18.07	12.75	0. 00	64. 10	0.353	0.000
3.	% Lowering percentage in hearing level of Left Ear	22.31	14. 99	0. 00	71. 10	0.337	0.000
4.	% Lowering percentage in hearing level of double ears	16.83	12.31	0. 00	62.56	0.311	0.000

b. The relationship between age and the lowering percentage in hearing level of the labourer at the age of ≤ 40 years old. The description of the lowering percentage in hearing level of the labourer exposed to noise in a company at the ageof ≤ 40 years old is listed in table 2.

TABLE 2. THE LOWERING PERCENTAGE IN HEARING LEVEL OF THE LABOURER EXPOSED TO NOISE IN A COMPANY AT THE AGE OF ⩽ 40 YEARS OLD

No.	Variable	Average	Deviation Standard	Min	Max	R	p
1.	Age (year)	30.22	7.36	17	40		
2.	% Lowering percentage in hearing level of Right Ear	16.12	13.02	0. 00	63.80	0.254	0.006
3.	% Lowering percentage in hearing level of Left Ear	17.99	13.36	0, 00	69.40	0.220	0.018
4.	% Lowering percentage in hearing level of double ears	14.86	11.46	0, 00	56.88	0.246	0.008

The description of the lowering percentage of hearing level of the labour exposed to noise in the company at the age of ≥ 40 years old is presented in Table. 3.

TABLE 3. THE LOWERING PERCENTAGE OF HEARING LEVEL OF THE LABOURER EXPOSED TO NOISE IN A COMPANY AT THE AGE OF ≥ 40 YEARS OLD

No.	Variable	Average	Deviation Standard	Min	Max	R	p
1.	Age (year)	44.75	3.50	41	60		
2.	% Lowering percentage in hearing level of Right Ear	19.12	12. 85	0. 00	64. 10	-0.193	0.097
3.	% Lowering percentage in hearing level of Left Ear	22.73	15.19	0. 00	71. 60	-0.154	0.188
4.	% Lowering percentage in hearing level of double ears	17.52	12.42	0.06	57.56	-0.223	0.054

The measurement result of noise intensity in spinning mill area company is 80-99 dBA [8]. The source of noise from spinning machine. The relationship between age and hearing loss of the labourer. The complete measurement result of hearing loss is presented in Table 2. The age description of the labourer from 190 people is divided into two groups, namely a group of people at the age of less than or equal to 40 years old amounted to 115 people, and a group of people at the age of over 40 years old amounted to 75 people. Then, the measurement of hearing loss using the audiometer to 190 samples is done at a frequency of 500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz. The measurement result of hearing loss is the average of the lowest sound intensity that can still be heard by subject on the fourth frequency. Then, the measurement results are classified into [9]:

1) Normal, if the average of hearing loss is less than 25 dB.
2) Mild hearing loss, if the average of hearing loss is between 25-40 dB.
3) Moderate hearing loss, if the average of hearing loss is between 40-55 dB.
4) Profound deafness, if the average of hearing loss is between 55 to 70 dB.

A labor who has severe deafness gas a working time >20 years, meanwhile there is no severe deafness labor in the <10 years working time. This is appropriate with the study to 5 deaf labors between 35-45 years old. According to Premenaker no 25 2008, a labor in the age >40 years old the hearing ability ia decrease 0,5 dB. According to Ologe (2008) said that the age average of the lack of hearing is range in 20-50 years old [7].

The description of the lowering percentage in hearing level based on age of the labourer exposed to noise in a company will be explained below. To find out how big is the lowering percentage in hearing level by age, it has been done a test from the relationship between age and lowering percentage in hearing level. The lowering percentage in hearing level is calculated in percentage (%). The test of the relationship between age and lowering percentage in hearing level of all labourer who are exposed to noise in a company amounted to 190 people is intended to determine whether the age is also followed by the lowering percentage in hearing level or not. The second test is about the relationship of lowering percentage in hearing level of labourer at the age of underor equal to 40 years old. It is done to know whether the younger age has shown the lowering percentage in hearing level or not. Meanwhile, the third test is about the relationship between age and the lowering percentage in hearing level of the labourer at the age of over 40 years old. The test is intended to determine whether or not the age under and over 40 years old will have a difference in the severity of hearing level calculated in a percentage (%).

The relationship of age and the lowering percentage of right ear hearing level of all labourerin table 1, it can be seen that the test result between age and lowering percentage in right ear hearing level of all labourer shows the correlation value of (r) = 0. 353 and p = 0.000. Because the value of p < 0.05, the test result is significant. It can be concluded that there is a significant relationship. Because the value of r is positive, then it is stated that the more increasing age, the more increasing of lowering percentage in hearing level will be.

The relationship between age and the lowering percentage in left ear hearing level of all labourer base on the table 1 shows the test result of the relationship between age and the lowering percentage in the left hearing level of all labourer. It shows the correlation value of (r) = 0. 337 and p = 0.000. Because the value of p < 0,05, the test result is significant. Thus, it can be concluded that there is a significant relationship. Because the value of r is positive, then it is stated that the more increasing of age, the more increasing of lowering percentage in hearing level will be.

The relationship between age and the lowering percentage in double ears hearing loss of all laboureron the table 1 presents the result of the test from the relationship between age and the lowering percentage in double ears hearing level of all labour. It shows the correlation value of (r) = 0. 311 and p = 0.000. Because the value of p < 0.005, the test result is significant. It can be concluded that there is a significant relation. Because the value of r is positive, then it is stated that the more increasing of age, the more increasing of lowering percentage in hearing level will be.

To determine the relationship between age and lowering percentage in hearing level of right ear, left ear, and double ears of the labour at the age of ≤ 40 years old, it has been done a statistical test by using Pearson Product Moment Test.

In table 2, it is presented the results of the test from the relationship between age and lowering percentage in the right ear hearing level of labour at the age of ≤ 40 years old. It shows the correlation value of (r) = 0, 254 and p = 0.006. Because the value of p < 0.05, the test result is significant. So, it can be concluded that there is a significant relationship. Because the value of r is positive, it is stated that the more increasing age, the more increasing of lowering percentage in hearing level will be.The relationship of age and the lowering percentage of left ear hearing level of the labourer at the age of ≤ 40 years old. In table 2, it is presented the result of the test from the relationship between age and the lowering percentage of left ear hearing level of the labourer at the age of less than or equal to 40 years old. The table shows the correlation value of (r) = 0.220 and p = 0.018. Because p < 0.05, the test result is significant. Because the value of r is positive, it is stated that

the more increasing age, the more increasing of lowering percentage in hearing level will be.

Based on the table 2, it can be seen the test result from the relationship between age and the lowering percentage of double ears hearing level of the labourer at the age of ≤ 40 years old. The table shows the correlation value of (r) = 0, 246 and p = 0, 008. Because the value of p < 0. 05, the test result is significant. It can be concluded that there is a significant relationship. Because the value of r is positive, it is stated that the more increasing age, the more increasing of lowering percentage in hearing level will be, same wiht Dino that based on age, obtained information that the respondents aged 21-35 years is the largest user of PPE which is about 67.8% and above 46 years of age to use PPE approximately 37.2% [10].

Based on the table 3, it can be seen the test result from the relationship between age and the lowering percentage of right ear hearing level of the labourer at the age of ≥ 40 years old. It shows the correlation value (r) = -0. 193 and p = 0. 097. Because the value of p > 0. 05, the test result is not significant. It is concluded that there is no significant relation. Thus, at the age of more than 40 years old, the increasing of age is not followed by the lowering percentage in hearing level [11].

The test result from the relation between age and the lowering percentage of left ear hearing level of the labour at the age of ≥ 40 years old (tabel 3), it shows the correlation value of (r) = -0.154 and p = 0, 188. Because the value of p > 0. 05, the result is not significant. It can be concluded that there is no significant relationship. Thus, at the age of more than 40 years old, the increasing of age is not followed by the lowering percentage in hearing level.

Table 3, it can be seen the test result from the relationship between age and lowering percentage of double ears hearing level of the labourer at the age of ≥ 40 years old. The table shows a correlation value of (r) = -0.223 and p = 0. 054. Because the value of p > 0. 05, so the test result is not significant. It can be concluded that there is no significant relationsip. Thus, at the age of more than 40 years old, the increasing of age is not followed by the lowering percentage in hearing level.

IV. CONCLUSION

It is concluded that the noise in the intensity of 80- 99 dB affects the lowering percentage in hearing level and hypertension of the labour in Central Java, based on the current study seems to suggest that workers should not be exposed to more than 89 dB as this had the least systolic and diastolic blood pressures [19].

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Resistence Status of Aedes Aegypti Larvae Against Temephos in Gunungpati Subdistrict, Semarang

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***Abstract*—Dengue Hemorrhagic Fever (DHF) is a major problem in Indonesia. In 2016, Incidence Rate (IR) = 77.96/100.000; Case Fatality Rate (CFR) = 0.79%. Semarang City, the Capital of Central Java Province, is an endemic area of DHF. Gunungpati is a subdistrict that has a high incidence of DHF. Some health workers sell abate (temephos) without notifying the appropriate dosage. Long-term use of larvacide and inacurate dosage may lead to resistance. This study aimed to determine the resistance status of Aedes aegypti larvae to temephos in Gunungpati sub-district. The population study was all of Ae. aegypti larvae in Gunungpati sub-district and the sample was Ae. aegypti larvae trapped by ovitrap and reared by researcher to obtain the first generation (F1). F1 larvae would be randomly exposed to temephos, with doses according to the WHO guidelines. We counted larval death after 24 hours of exposure by larval resistance indicator. This was true experiment with randomized pretest-posttest design with control group. The results showed that Ae. aegypti larvae in Gunungpati sub-district were tolerant to temephos, because the average of larvae mortality were 81-95% in temephos exposure with WHO-recommended dose.**

***Keywords— resistance, Aedes aegypti, temephos*.**

I. INTRODUCTION

Dengue hemorrhagic fever (DHF) is still one of major health issues in Indonesia. The high incidence and distribution of this disease throughout Indonesia remain unsolved[1]. DHF outbreak often emerges in 5-10 years cycle. DHF is an infection of Dengue virus, which has four serotypes of flavivirus: DEN-1, DEN-2, DEN-3, DEN-4[2]. Those virus can be transmitted from female mosquito of *Aedes* aegypti, as the main vector, or from *Aedes albopictus*, as the secondary vector, to human[3].

One of the principal ways to control DHF is by breaking the chain of transmission and by controlling the DHF vector. Vector control has been considered more effective than simply treating the disease[4]. Larvae eradication is the strategic key of DHF vector control worldwide, because this can cut the life cycle of the mosquito[5]. The most prominent way to reduce the mosquito population in the community is by draining/tapping the water container/reservoir as well as brushing its wall, at least once a week. This treatment can prevent the larvae from growing into mosquito, therefore decreasing the population. Brushing the water reservoir wall tends to remove the eggs that stick to the wall. The eggs will drop, carried away by the draining water, and fail to hacth[6]. Insecticide use is an alternative way to diminish mosquito population. Chemical insecticide, such as larvacide, is commonly used in community to control the vector[7]. Abate or Temephos is the most common insecticide used in Indonesia. Temephos is one among a type insecticide that kill insect at larvae stage. Temephos preparation is mostly available as sand granules[8]. Temephos is pourable to any water reservoirs that are difficult to drain. The application dose of temephos is 1ppm or 1 gram for 10 litre of water[9].

For several decades, temephos was considered effective in preventing the larvae from evolving in water reservoirs. However, in the last several years, there were reports of its resistance in some countries, including Indonesia, such as in West Banjarmasin region that was in BanjarBaru, South Kalimantan. Some regions in Central Java, such as Tanjung Mas region of Semarang, Sidorejo subdisrict of Salatiga, and in Jakarta, such as Tanjung Priok and Mampang Prapatan, showed decreased sensitivity of *Aedes Aegypti* larvae toward temephos. The sensitivity tests toward temephos were conducted continuously in Dengue endemic regions[10]. The aim of the test was to determine the sensitivity status of *Ae. Aegypti* toward larvacide properties of temephos, because until present, temephos is still widely used to prevent the life cycle of *Ae. aegypti*.

There was no available data about resistance status of *Ae. aegypti* larvae in Gunungpati sub-district toward temephos 1%, even though this region is endemic for DHF, mostly in the villages. This research aimed to obtain resistance status of *Ae. aegypti* larvae toward temephos 1%. Temephos 1% (0,012 mg/l) was the WHO-recommended dose.

II. MATERIALS AND METHODS

This was an experimental study with Postest Only with Control Group Design. The sample of study was mosquito larvae of *Ae.aegypti* at instar III stage, from cultivation of first generation larvae obtained from Gunungpati sub-district, Semarang city. In this study, the subject were divided in two group: the experiment group (receive temephos intervention at several different doses) and the control group (receive no intervention). The vulnerability test was conducted according to WHO conditions, using larvae instar III as the sample. The test initially used 25 larvae per cup for each treatment. Federer formula was used. According to Federer formula, 6 concentrations would needed at least four repetitions. The treatments (concentrations) given are temephos at concentration of: 0.003 mg/l; 0.006 mg/l; 0.012 mg/l; 0.024 mg/l; 0.048 mg/l; and 0.096 mg/l with four repetitions. The larvae-temephos exposure was 24 hour. Total number of instar III needed was 700 larvae from each village.

Population in this study was first generation *Ae. aegypti* larvae (F1). Initially, the researchers trapped *Ae. aegypti* mosquito from environment while conducting survey in four villages of Gunungpati sub-district, Semarang City: village of Patemon, Sekaran, Mangunsari, dan Pakintelan. The selection of these 4 villages was based on the high annual incidence of DHF in these areas.

The *Ae. aegypti* larvae was collected using ovitrap. The placement of ovitrap was in several houses randomly. Then, we brought the trapped larvae to the laboratory for breeding. After they transformed into mosquitoes, they were placed in a special cage and were fed with blood and sugar water until they laid eggs. The eggs hatched first generation (F1) larvae. After turning into instar 3 larvae, we randomly selected them as sample.

Primary data collection was conducted by counting the number of the dead *Ae. aegypti* larvae in intervention group or control group. According to WHO, resistance status of *Ae. aegypti* larvae was determined by the percentage dead larvae in 0.012 mg/l of temephos. The category of resistance status of *Ae. aegypti* toward temephos is as follow[4]:

1. Vulnerable/sensitive, if the larvae death was 98-100%.
2. Tolerant, if the larvae death was 80-97%.
3. Resistant, if the larvae death was < 80%.

We use Anova to statistically test the difference between percentage of death of *Ae. aegypti* larvae in different temephos concentrations.

III. RESULTS AND DISCUSSION

This study described the region characteristic based on score of House Index (HI), Container Index (CI), Breteau Index (BI), and Angka Bebas Jentik (ABJ/Free Larvae Number). The number of exmined houses were 100 per villages.

According to Table 1, Sekaran village had the highest HI value (34%) while Mangunsari village had the lowest HI value (16%). Sekaran village also had the highest CI value (30.2%) while Mangunsari villlage had the lowest (14.8%). The higher the value of HI and CI in the region, the higher the risk of DH transmission in the region[11]. Our data also showed that the vector existence in Gunungpati sub-district was fairly high. According Ministry of Health of Republic of Indonesia), ABJ lower than 95% would increase the probability of dengue virus transmission.

Our findings also showed that Gunungpati sub-district had regional high risk criteria for dengue transmission, because the average HI value in its 4 villages was 23.5%, and the limit specified by government to reduce dengue incidence was HI > 5%[12]. HI value was one of most regular indicator to monitor the mosquitoes infestation level[13].

The CI value described the number of larvae-positive container, compared with all containers in the region. Hence, the CI value could describe the percentage of larvae positive container[14]. We obtained an average CI value of 20.75% in the 4 sample villages in Gunungpati sub-district of Semarang. Many rent houses or rooms for college students that was separated from the main house/building contributed for many larvae positive containers. The low awareness from the residents (college students) on draining water reservoirs regularly and on cleaning potential leftover bottles/glass that held water contributed for larvae positive containers.

TABLE 1. CHARACTERISTIC OF THE RESEARCH SITE

Measurements	Value
Sekaran Village	
Number of (+) larvae houses	34
Numer of (+) larvae container	41
Number of container examined	136
HI	34%
CI	30.2%
BI	41%
ABJ	66%
Patemon Village	
Number of (+) larvae houses	21
Number of (+) larvae container	21
Number of container examined	113
HI	21%
CI	18.6%
BI	21%
ABJ	79%
Pakintelan Village	
Number of (+) larvae houses	23
Number of (+) larvae container	25
Number of container examined	129
HI	23%
CI	19.4%
BI	25%
ABJ	77%
Mangunsari *Village*	
Number of houses (+) larvae	16
Numer of container (+) larvae	19
Number of the examined container	128
HI	16%
CI	14.8%
BI	19%
ABJ	84%

They assumed that draining the water reservoirs was not a personal, collective responsibility. Therefore, they only relied on the other mates to do the job. This situation led the irregular draining of water reservoirs because only willing resident who do it. Mainly, mounting college tasks also limit their awareness because of lack time to clean the environment and to monitor mosquito larvae.

For the temephos usage, we did not directly observe whether the temephos application in Gunungpati was regularly or not. However, data from the interview showed that the community awareness was higher when DHF case was found in their area. It triggered them to use temephos to prevent the spread of the disease. Therefore, there was an irregular use of temephos in Gunungpati community. Based on interview, a staff of Puskesmas (Community health center) stated that Puskesmas staffs distributed free temephos for every family every time the DHF emerged in the region, or when there was request from the community. However, citizen revealed that beside the Puskesmas staffs/cadres, there were other people claiming as health worker and selling temephos.

TABLE II. PERCENTAGE OF LARVAE DEATH DIFFERENCE IN SEVERAL TEMEPHOS CONCENTRATIONS

Temephos Concentration(mg/l)	**Average *Ae. aegypti* Larvae Death**	
	Number	*Percentage*
Sekaran village		
0.003	14.5	58
0.006	18.75	75
0.012	20.25	81
0.024	24	96
0.048	24.5	98
0.096	25	100
Control	0	0
Patemon village		
0.003	16.25	65
0.006	19.25	77
0.012	21.25	85
0.024	23.25	96
0.048	25	100
0.096	25	100
Control	1	4
Pakintelan village		
0.003	17.5	70
0.006	19.5	78
0.012	23.75	95
0.024	25	100
0.048	25	100
0.096	25	100
Control	0	0
Mangunsari village		
0.003	17	68
0.006	19.5	78
0.012	23.25	93
0.024	24.5	98
0.048	25	100
0.096	25	100
Control	0	0

During the study, we set the room temperature from initial intervention until the last intervention to 26-27^{0}C. Sudarto theory that declared that to reach optimum growth, the *Ae. aegypti* larvae needed optimum environment temperature between 25-30^{0}C. We could see this optimum growth in the control group where the percentage of larvae death was <5%.

The larva death was only due to exposure to temephos concentration, because the environment was well controlled. We measured the room humidity using hygrometer, and it measured about 64- 66% from the beginning until the end of study. This condition fulfilled the examination standard for room humidity. The appropriate humidity promoted the life support of the mosquitoes from the eggs, larvae, pupas, until adults were 60% - 80%. Because the room temperature and humidity was favorable for the larvae lives, the larvae deaths should be due to non-environmental factor.

The percentage of larvae death at WHO-recommended dose of 0.012 mg/l indicated that there had not been reduced vulnerability status (resistant) toward the larvacide used (temephos 1% or Abate 1SG) in *Ae.aegypti* larvae in Gunungpati. However, because the average of the larvae death exposed with temephos 0.012mg/l was 88.5%, the larvae was considered tolerant. According to WHO criteria, larvae of *Ae. aegypti* reached the tolerant status when the percentage of death was 80-97%. In this study, in Sekaran village, the percentage of larvae death at WHO-recommended dose showed only 81%, Patemon village 85%, Pakintelan village 95%, and Mangunsari village 93%. The use of temephos as one of larvacide compound was still applicable in larvae control in Gunungpati sub-district. However, due to the early tolerant status, larvacide rotation should be conducted in order to prevent the resistance. This result was unexpected considering temephos had been used for more than 20 years in Semarang City.

The tolerant status toward temephos in Gunungpati might be caused by the uncoordinated or unregulated use of this agent. Community that obtained temephos might have little knowledge in using it properly due to limited socialization. It is used also lacked monitoring and information on its appropriate and safe use of temephos. The acts of citizens to use the agent also affected the usage. Citizens lacking the knowledge on its roper use and its basic chemical properties increased the risk of resistance. Moreover, there were the Abate 1 SG distribution from some people claiming as health workers, leading to no valid record and monitoring from Puskesmas.

Larvacide used for larvae vector control in Gunungpati was Abate that contained active material of temephos 1% by pouring the agent granules in potential or difficult to drain water reservoirs.

The resistance status in Gunungpati sub-district was different from the other regions in Indonesia. North Banjarmasin and Banjarbaru of South Kalimantan, as well as some Regencies/Cities like South Kalimantan, Central Java, and Jakarta had susceptible status. The research of resistance status of *Ae. aegypti* larvae toward temephos tested by Bisset et al. in Cuba by studying *Ae.aegypti* larvae isolated from 15 locations di Havana City, resulted that all samples were resistant. Larvae of *Ae. aegypti* in endemic

area in West Jakarta showed a tolerant and even resistant status to temephos[14].

From the resistance test, we found that there was percentage of larvae death of < 5% in the control group, especially in the larvae isolated from Patemon village. The death percentage in the control group (no temephos exposure) at the 24th hour was 4%, therefore the correction with Abbot's formula for control group was unnecessary.

Local health workers could consider preparing alternative larvacide to prevent temephos resistance in the area. In Gunungpati, the society had been trying several methods to control DHF disease. Among them are environmental management such as eradication of mosquito breeding ground (PSN) through the 3M Plus Program and sanitation management, although, there was still lack awareness from those who lived in boarding house.

Indication of resistance status to temephos was one of the method to regularly evaluate this insecticide effectiveness, so resistance could be detected and prevented[15, 16]. There was an awareness regarding cross resistance between *Ae. aegypti* and temephos. It was possibly due to in managing DHF case in rainy season and the eradication of adult mosquitoes used fogging agent that also could promote resistance[17, 18]. The resistance of *Ae. aegypti* to temephos could also occur simultaneously with resistance to adulticida malathion or piretroid, complicating the vector control strategy[19].

Citizens in the village of Sekaran, Patemon, Pakintelan, and Mangunsari received free temephos from Puskesmas through PKK (Empowerment of Family Welfare) cadres in each region, particularly, during the rainy season when DHF incidence rise. But, there were also those who never received temephos from the cadres because of limited stocks of temephos. Beside, some of them bought temephos in the drugstore or from people that claiming as health workers.

IV. CONCLUSION

Larvae of *Ae. aegypti* in Gunungpati sub-district, Semarang City, was tolerant toward temephos. The usage of temephos is still applicable in Gunungpati sub-district, Semarang city, but the rotation of larvacides is necessary to prevent further resistance.

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The Effect of Red Guava Juice to MDA (Malondealdehyde) Levels on The Athletes in The Garuda Bintang Football School Getting Sub-Maximal Physical Activity

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***Abstract*—The purpose of this study was to determine effect of red guava juice to changes in MDA levels in the blood of atheletes after getting physical activity sub-maximum, difference effect between a high pulse and low pulse rate on the results of MDA levels, effect of red guava juice 100 grams and 150 grams of the MDA levels in the blood, understand the interaction between red guava juice and pulse on the results of MDA. The study used an experimental design. The study population is athelete in Garuda Bintang Football School amount 63 people. Sample study of 16 people who were taken using purposive sampling technique. The sample consisted of 8 players who get physical activity sub-maximum (pulse) high and 8 players getting physical activity sub-maximum (pulse) is low. The instrument used to retrieve the data are: (1) physical activity such as running 2400 meters (2) measurement of pulse rate and (3) test MDA (Malondialdehyde). Data collection techniques to test and measurement Data analysis techniques used ANOVA.**

Keywords— red guava juice, sub-maximal pulse, MDA (malondialdehyde).

I. INTRODUCTION

Physical activity is an activity developed with the hope of living can provide added value in the form of improved quality, prosperity and human dignity. Physical activity can provide an impact on various aspects of life such as psychology, social, economic, cultural, political and biological function. Against the biological function of physical activity is a modulator with a broad spectrum of influence and can occur at various levels of functionality.

Regular physical exercise if done as part of a healthy lifestyle would be a lot beneficial for health and may affect/reduce the risk of cardiovascular disease, osteoporosis and diseases other degenerative. In this case one of the mechanisms that come into play a role is decreased fatty tissue, lipid profile, hormonal changes and improving the function of the mitochondria. Physical exercise can also increases the function of muscles, maintaining muscle mass and improve the cardiovascular system of adaptation this disclosed serum antioxidant stress injury and cell aftersevere physicaal exercise [8].

Heavy physical activity carried out with the aim of them to improve the well-being, health, and dignity of human life. Examples of heavy physical activities such as anaerobic exercise such as swimming and run a short distance. In certain circumstances, heavy physical activity can give negative influences that is impeding or disturbing the physiological processes in the body.

Physical exercise can also cause or trigger an imbalance between the production of free radicals with antioxidants, which are known as oxidative stress, during maximum physical exercise, consumption of oxygen in the body can be increased up to 20 times. While the consumption of oxygen by muscle fibers is estimated to increase up to 100 fold. Increased consumption of oxygen this led to an increased production of free radicals that can cause cell damage. Oxidative stress is a State where the production of free radicals exceeds the cellular antioxidant defense system, so that damage cell membranes of muscle cells, including brain cells and the liver.

Malondialdehyde (MDA) according to [24] is one of the compounds are products of a reaction is the concentration of lipids that are used as marker (marker) occurrence of oxidative stress. On the State of oxidative stress, an increase in serum MDA levels significantly. When the State of oxidative stress MDA levels resolved, again declining. Free radicals are atoms or molecules have electron pair on their outer orbital and can stand on its own [9]. Most free radicals react rapidly with other atoms to fill the orbitals that are not paired, so that free radicals normally stand alone in just a short period of time before it merges with other atoms.

One of the indicators used to determine oxidative stress in humans is the levels of MDA (Malondialdehyde) which is

a result of the concentration of lipids in the body due to free radicals [9]. Antioxidants are distinguished into two groups namely

Antioxidant enzymatic and non-enzymatic. Antioxidant enzymatic antioxidant also known as deterrent, consisting of superoksid dismutase, catalase, and glutathione peroxidase. Antioxidant enzymatic antioxidant also known as non-breaking the chain. A chain-breaking antioxidant consisting of the vitamin C, vitamin E, and beta carotene [8].

One of the antioxidants that are able to ward off free radicals is ascorbic acid or known as vitamin C. Vitamin C is an antioxidant non enzimanatis of micronutrients that is soluble in water. Vitamin C acts as redaktor for different free radicals. It also minimizes the occurrence of damage to cells and tissues caused by oxidative stress. Antioxidant vitamins proven to react against free radicals and reduces the ability to perform microscopic damage.

Askrobat Acid is the first line of Defense of antioxidants in plasma, and also effectively protects Low-Density Lipoproteins (LDL) against oxidative stress". Vitamin C is also believed capable of overcoming fatigue caused by physical load that occurs when working or while moving. During exercise or activity with a pretty heavy workload the excretion of vitamin C increases through urine and sweat. So we can say needs vitamin C increase on sportsman [2].

Vitamin C is an important vitamin that is soluble in water. These vitamins are often consumed by people. Up to now, the function of vitamin C which is known as the immune system enhancer, collagen formation, suppression of aging and as a flu remedy. The community know that this vitamin is also useful for people who often work. Vitamin C is a water-soluble antioxidant and is present in the cytosol and liquid ekstrasel. Although in very small amounts, vitamin C can protect proteins, lipids, carbohydrates, and nucleic acids from the damage caused by the process of the formation of prooksidan produced by normal metabolism.

Vitamin C can prevent damage to the network by reducing the production of oxidants. Yet to be explained that vitamin C plays directly in the process of recovery of the tissue or indirectly play a role in that process. A great many kinds of foods that contain vitamin C, whether natural or synthesis in the form of vitamin supplements or foods and drinks containing vitamins. Because the needs of sportsmen and because of easy it is the concentration of vitamin C is lost in natural foods. Then to meet the needs of the vitamin C needs to be given additional and natural vitamin C.

Red guava fruit contains a lot of vitamin C, 4 times as much vitamin C is in the content of citrus fruits. According to [14]. Red guava fruit contains Vitamin C as 887 mg in 100 g/red guava. Guajava (*Psidium guajava. L*) containing compounds, β-carotene vitamiC, vitamin E, which has a bitter taste and potency antioxidants.

II. MATERIALS AND METHODS

TABLE 1. 2X2 EKSPERIMENT FACTORIAL DESIGN

The pulse sub-maximum (B)	**Red Guava Juice**	
	100 gram (A_1)	***150 gram (A_2)***
High (B_1)	A_1B_1	A_2B_1
Low (B_2)	A_1B_2	A_2B_2

Description:
A1 = guava Juice 100 gram
A2 = guava Juice 150 gram
B1 = high pulse rate
B2 = low pulse rate
A1B1 = groups given 100 red guava juice grams on samples that get physical exercise sub-maximal results with a high pulse rate
A2B1 = group given red guava juice 150 grams on samples that get physical exercise sub-maximal results with a high pulse rate
A1B2 = group given red guava juice 100 g in samples that get physical exercise sub-maximal results with low pulse rate
A2B2 = group given red guava juice 150 grams on samples that get physical exercise sub-maximal results with a low pulse rate.

The research using experimental methods in a 2x2 eksperiment factorial design. Sampling technique is the purposive technic be based on age the atheletes with sampling and retrieved samples as many as 16 people out of a total population of 63 people. Technique of data analysis used the test of anava two lines with the program SPSS 20.0 and 5% significance level, followed by the Tukey test.

This research uses experimental methods with a 2x2 eksperiment factorial design. Two variables are manipulated simultaneously to investigate the influence of each extent against variable bound and influences caused by the interaction between some variable.

III. RESULTS AND DISCUSSION

A. Comparison of influence between the awarding of the red guava juice against the levels of MDA on Garuda Bintang football school athlete.

To test the hypothesis that states the difference between the influence the awarding of the red guava juice against the levels of MDA Garuda Bintang football school athlete, used variansi analysis of two way obtained the following results:

Based on the results of the analysis the influence of the difference between the giving of red guava juice against the levels of MDA (Malondialdehyde) on Garuda Bintang football school athlete acquired F value count of 40.334 and F table of 4,747 and with p value or level the significance of 0.000, because the value of Fcount (40,334) > F table (4,747) as well as the significance level of 0.000 < 0.05. alternative hypothesis (Ha) which means that read "there is have a difference between influence awarding of red guava juice beans against the levels of MDA (*Malondialdehyde*) on athlete Garuda Bintang Football School "received. And null hypothesis (Ho) which reads "there is heve not difference between influence awarding of red guava juice against the levels of MDA (*Malondialdehyde)* on athlete

Garuda Bintang Football School " was rejected and because there is a difference then followed by Tukey test.

TABLE II. ANALYSIS VARIANCE OF INFLUENCE BETWEEN THE GRANTING OF RED GUAVA JUICE AGAINST THE LEVELS OF MDA ON GARUDA BINTANG FOOTBALL SCHOOL ATHLETE

Source Of Variation	**Add Red Guava Juice**	**Total**
dk	1	12
JK	25.5	7.6
JKT	25.5	0.6
Fc	40.334	
Ft	4.747	
Sig	0.00	
Exp	Signifikan	

TABLE III. THE RESULTS OF THE AVERAGE LEVELS OF MDA (MALONDIALDEHYDE) ON ATHELETE GARUDA BINTANG FOOTBALL SCHOOL BY ADMINISTERING RED GUAVA JUICE 100 G AND 150 G

Dependent Variabel : Result of MDA Test			
Administering red guava juice		***100 gram***	***150 gram***
Mean		13.548	11.025
Std.Error		.281	.281
95% Confidence Interval	***Lower Bound***	12.936	10.413
	Upper Bound	14.159	11.637

The average result of the levels of MDA (Malondialdehyde) on athlete Garuda Bintang Football School by administering red guava juice can be seen in the table III.

Based on the table are obtained that the results of the average levels of MDA (Malondialdehyde) on athletes Garuda Bintang Football Scholl by administering red guava juice 100 g obtained average results 13,548 whereas on average yield levels of MDA (Malondialdehyde) athletes on Garuda Bintang Football Scholl by administering red guava juice 150 grams obtained average results of 11,025 so that the difference between the average results of the levels of MDA (Malondialdehyde) between the granting of red guava juice 100 g and 150 g of 2.523.

B. The comparison between the influences of the get physical activity sub-maximal (pulse) high and low test results against the levels of MDA on Garuda Bintang Football School athlete

To test the hypothesis that states the difference between the influence of the get physical activity sub-maximal (pulse) test against high and low levels of MDA (Malondialdehyde) on the athletes in the school's football Garuda Bintang used analysis variansi Two Way obtained the following results.

TABLE IV. ANALYSIS VARIANCE OF INFLUENCE BETWEEN THE GET PHYSICAL ACTIVITY SUB-MAXIMAL (PULSE) HIGH AND LOW TEST RESULTS AGAINST THE LEVELS OF MDA (MALONDIALDEHYDE)

Source Of Variation	**Get physical activity sub-maximal (pulse)**	**Total**
dk	1	12
JK	3.080	7.572
JKT	3.080	0.361
Fc	4.881	
Ft	4.747	
Sig	0.047	
Exp	Signifikan	

TABLE V. THE RESULTS OF THE AVERAGE LEVELS OF MDA (MALONDIALDEHYDE) ON THE ATHLETES IN SCHOOL FOOTBALL GARUDA BINTANG GET PHYSICAL ACTIVITY SUB-MAXIMAL (PULSE) HIGH AND LOW

Physical activity sub-maximal		**High**	**Low**
Mean		12.725	11.847
Std.Error		.281	.281
95% Confidence Interval	***Lower Bound***	12.113	11.236
	Upper Bound	13.337	12.459

Based on the results of an analysis of the difference between the influence of influence get physical activity sub-maximal (pulse) high and low test results against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football retrieved the value of the Fc of Ft and 4,881 of 4,747 and with p value or significance level of 0.047 F value, because F count (4,881) > F table (4,747) as well as the level of significance of 0.047 0.05. Ha meaning < which reads "there's a difference between influence the get physical activity sub-maximal (pulse) high and low test results against the levels of MDA (Malondialdehyde) on the athletes in Garuda Bintang school's football "received. And Ho which reads "there is no difference between who gets influence physical activity sub-maximal (pulse) high and low test results against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football " was rejected.

Because there is a difference then followed by Tukey test. The average result of the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football get physical activity sub-maximal (pulse) high and low can be seen in the table V.

Based on the table results obtained average levels of MDA (Malondialdehyde) on the athletes in school football Garuda Bintang get physical activity sub-maximal (pulse) high earned an average of 12,725 results while the average results the levels of MDA (Malondialdehyde) on the athletes in school football Garuda Bintang get physical activity sub-maximal (pulse rate) lower average results obtained of 11,847 so that the difference between the average results of the levels of MDA (Malondialdehyde) between the get physical activity sub-maximal (pulse) the highs and lows of 0.878

C. The interaction between the granting of red guava juice against the levels of MDA (Malondialdehyde) on the

athletes in school football Garuda Bintang get physical activity sub-maximal (pulse)

To test the hypothesis that the third namely interaction used variansi analysis of Two Way. The results of the calculation analysis of the difference between the giving of red guava juice against the levels of MDA (Malondialdehyde) on on the athletes in school football Garuda Bintang get physical activity sub-maximal (pulse) obtained the table v.

Based on the results of the analysis of the interaction between the granting of guava juice red against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse) obtained the value of 4.8 Fcount and Ftabel of 4.7 as well as with the p value or significance level of 0.048, because the value of Fcount (4.8) > F table (4.7) as well as the level of significance of 0.05 meaning 0.048 < Ha which reads "There is interaction between the awarding of the red guava juice against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse) "received. And Ho which reads "There is no interaction between the awarding of the red guava juice against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse)" was rejected.

The average yield of the average levels of MDA (Malondialdehyde) between the granting of red guava juice and getting physical activity sub-maximal (pulse) can be seen in the table vi.

TABLE VI. SUMMARY TWO FACTOR OF ANOVA

I	dk	JK	JKT	Fc	Ft	Sig	Exp
A	1	3.1	3.1	4.9	4.7	0.05	Sig
B	1	25.5	25.5	40.3	4.7	0.000	Sig
C	1	3.1	3.1	4.8	4.7	0.048	Sig
D	12	7.6					
E	15	39.2	0.6				
F	16	2454.3					

* Description:
I= Source Of Variation
A= Physical Activity Sub Maximal
B= Administering Red Guava Juice
C=Interaction (physical activity sub-maximal x administering guava juice red)
D= Interracial
E= Error
F = Total

TABLE VII. THE RESULTS OF THE AVERAGE LEVELS OF MDA (MALONDIALDEHYDE) BETWEEN THE GRANTING OF RED GUAVA JUICE AND GETTING PHYSICAL ACTIVITY SUB-MAXIMAL (PULSE).

Physical activity sub-maximal		**High**		**Low**	
Administering red guava juice		100 g	150 g	100 g	150 g
Mean		13.55	11.90	13.54	10.15
Std.Error		.397	.397	.397	.397
95% Confidence Interval	***Lower Bound***	12.68	11.03	12.68	9.28
	Upper Bound	14.41	12.76	14.41	11.01

Based on the tables retrieved the results test average MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) high by administering red guava juice 100 grams of retrieved results average 13,550, while the average test results of MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) high by administering red guava juice 150 grams of 11,900.

Based on the tables retrieved the results test average MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) by administering red guava juice 100 g obtained results average 13,545, while the average test results of MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) by administering red guava juice 150 grams of 10,150.

Based on research this is in line with the statement according to Reference [23] moderate exercise is a healthy practice. However, exhaustive exercise generates free radicals. This can be evidenced by increases in lipid peroxidation, glutathione oxidation, and oxidative protein damage. It is well known that activity of cytosolic enzymes in blood plasma is increased after exhaustive exercise. This may be taken as a sign of damage to muscle cells. The degree of oxidative stress and of muscle damage does not depend on the absolute intensity of exercise but on the degree of exhaustion of the person who performs exercise. Training partially prevents free radical-formation in exhaustive exercise. Treatment with antioxidants such as vitamins C or E protects in part against free radical-mediated damage in exercise. Xanthine oxidase is involved in free-radical formation in exercise in humans and inhibition of this enzyme with allopurinol decreases oxidative stress and muscle damage associated with exhaustive exercise. Knowledge of the mechanism of free-radical formation in exercise is important because it will be useful to prevent oxidative stress and damage associated with exhaustive physical activity.

IV CONCLUSION

There is a difference between influence awarding of red guava juice against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang football school, difference between who gets influence physical activity sub-maximal (pulse) high and low test results against the levels

of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football and there is an interaction between the awarding of the red guava juice against the levels of MDA (Malondialdehyde) the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse). On samples that get physical activity sub-maximal (pulse rate) is low better given red guava juice 150 grams compared to samples that get physical activity sub-maximal (pulse).

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Effectiveness of Red Guava Juice in Increasing Erythrocyte Index for Prevention of Anemia in Adolescents

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***Abstract*—The aim of study is to determine the effect of red guava juice on the erythrocyte index profile of adolescent. Method of research is pre experimental with one group pretest postest design. 30 students at AAK 17 August 1945 Semarang were selected by purposive sampling technique. Guava juice are given 3 cc/kg/day for 7 days. Erythrocyte index were measured at before and after treatment. There was a significant differences between pre test and post test. Moreover consumption of red guava juice is more effective in increasing erythrocyte index. Red Guava juice can be a supplementary to prevent occurence of anemia in adolescents.**

Keywords—red guava, erythrocyte index, anemia, adolescent

I. INTRODUCTION

Anemia is one of the nutritional problems still occurring in Indonesia, mainly caused by iron deficiency. Iron deficiency anemia has a great influence on adolescence and premenopausal women in developing countries and poor countries. The prevalence of adolescent anemia is 27% in developing countries and 6% in developed countries. The prevalence of iron anemia without the addition of reported dietary diets is 40% in preschool children, 30% in teens and women of childbearing age, and 38% in pregnant women. This shows an increase in physiological needs during a specific life phase and depends on sex, and the rapid growth phase in adolescence is a critical period [1, 3].

Adolescence is a growth and development period of physically, mentally and activities so that the needs of foods containing nutrients become larger. Young women have a higher risk of anemia due to increased iron demand due to growth and menstrual cycle. The amount of iron loss during a menstrual cycle of approximately 0.56 mg per day is accompanied by a basal loss of 0.8 mg / day so that the total amount of iron lost is 1.36 mg per day [4, 5].

The diagnosis of iron deficiency anemia can be done by examining the erythrocyte index. The erythrocyte index examination consisted of 3 parameters are Mean Corpuscular Value (MCV), Mean Corpuscular Hemoglobin (MCH), and Mean Corpuscular Hemoglobin Concertration (MCHC). A person with anemia will experience a decrease in MCH and MCHC levels, but the MCHC start decrease if the anemia has been long periode or severe. The degree of change in erythrocyte index level is related to the stage and duration of anemia.

During this time most people with anemia get iron intake through consumption of Fe tablets. However, many refuse to consume Fe tablet because of side effects are nausea,vomit and blackish-colored stool. Therefore needed another effort, one of them by consumption of red guava fruit (Psidium Guajava L) [6, 7]. Red guava fruit contains iron, vitamin C, amino acids (tryptophan, lysine), calcium, phosphorus, sulfur, vitamin A, and vitamin B1 [8]. Vitamin C will increase the absorption of non heme iron up to four times or 2% -20%. Red guava also contain antioxidant compounds are flavonoids and carotenoids such as beta carotene, lycopene, beta cryptoxanthin and polyphenols [9, 10]. Flavonoids help in preventing the adverse effects of free radicals. The erythrocyte membrane is one of the cell membranes susceptible to free radical attack. When free radicals attack the erythrocyte membrane, the fluidity of the cell membrane will be disrupted and cause lysis and even cell death, causing a decrease in the amount of erythrocytes and hemoglobin levels [11]. As an antioxidant, βcarotene works to capture free radicals, especially peroxyl radicals and hydroxyl and β-carotene works synergistically with vitamins C and E [12].

Features fruit guava having various types of antioxidant and potent antioxidant activity is great, researchers are interested to examine the effect of red guava juice against erytrocyte index on adolescent.

II. MATERIALS AND METHOD

Method of research is pre experimental research with Pre and Post Design. This research was conducted at Medical Laboratory of Akademi Analis Kesehatan 17 August 1945 Semarang. Population are students at 3 grades at Akademi Analis Kesehatan 17 August 1945 Semarang. Sampling was taken in a total 30 respondents with sampling technique by purposive sampling , and criteria used as a sample respondents are girls students, not having menstruation as long as research, not being taking additional vitamins or supplement,not having chronic illnes, diets on balance nutrition. All the participants provided informed consent.

A. Making Red Guava Juice

The initial stage is done by collecting raw guava materials. Then the red guava fruit peeled, cut and separated with the seed of the fruit. Red guava juice is made by taking the essence of the flesh without seed is clean and fresh, then put in a blender without the addition of water or any other material

B. Treatment

Each respondent was given 100% guava juice with volume 3 ml / kg BW consumed 1 times / day for 7 days.

C. Measurement of Hemoglobin

Measurement of Hemoglobin content using Cyanmethemoglobin method using Drabkin's solution. The first tube contains 5 ml of drabkin solution, a second tube containing 5 ml of drabkin solution and 20 µl of EDTA blood. Incubate at room temperature for ± 5 minutes. Then read using Clinicon 4010 Photometer with C / F program, 546 nm length and 36.77 factor.

D. Measurement of Hematocrit

Measurement of Hematocrit content using Mikromhematokrit method. Blood is inserted into a 3/4 hematocrit tube of the tube. Closes with putty. Centrifuge for 5 minutes with a speed of 16,000 rpm. The reading uses a hematocrit device.

E. Measurement of Eritrocytes

Sucking up EDTA blood until the line is 0.5. Dilute it with Hayem solution until line 101. Homogenize by turning the erythrocyte eyedropper pipette for 15-30 seconds (if not checked immediately put it horizontally). Dripped on the booth count Improved Neubauer and counted on 25 small squares.

F. Measurements of Index Eritrocytes

Mean Corpuscular Value (MCV)

$$MCV = \frac{Hematokrit}{Eritrosit} \times 10\ (fl)$$

Normal Values : 82 - 92 fl

Mean Corpuscular Hemoglobin (MCH)

$$MCH = \frac{Hemoglobin}{Eritrosit} \times 10\ (pg)$$

Normal Values : 27 - 31 pg

Mean Corpuscular Hemoglobin Consentration (MCHC)

$$MCHC = \frac{Hemoglobin}{Hematokrit} \times 100\ (\%)$$

Normal Values : 32 – 37 %

Data were analyzed by statistical test using computerized. Distribution data are normal so that the parametric statistic test was tested by Paired t-test. Data that is not normally distributed is tested by the Wilcoxon test. 95% confidence level or α = 0.05.

III. RESULTS AND DISCUSSION

Measurements conducted before and 7 days after guava juice juice red. Table 1 shows the average of MCV before the consumption of red guava juice was 84.83fl and after the consumption of red guava juice was 85.65 fl with an increase of 0.97%. The average MCH before the consumption of red guava juice was 28.37 pg and after consumption of red guava juice was 29.81 with an increase of 5.07%. The average of MCHC before the consumption of red guava juice was 33.44% and after consumption of red guava juice was 34.73% with an increase of 3.99%.

TABLE 1. MEAN OF ERYTHROCYTE INDEX

Variable	Pre Test	Post Test
MCV (fl)	84,83	85,65
MCH (pg)	28,37	29,81
MCHC (%)	33,44	34,73

Statistical Analysis results in the table. 2 obtained P = 0,000 (P <0.05) showned that the erythrocyte index after consumption of red guava juice increased significantly compared with before the consumption of red guava juice.

TABLE 2. STATISTICAL ANALYSIS OF ERYTHROCYTE INDEX

	Normality Test	Statistical Analysis
	Sig.	Sig.
MCV pretest	0,005	0,000 (Wilcoxon)
MCV posttest	0,011	
MCH pretest	0,534	0,000 (Paired T-Test)
MCH posttest	0,765	
MCHC pretest	0,967	0,000 (Paired T-Test)
MCHC posttest	0,240	

This research proves that red guava juice has the potential to increase the value of erythrocyte index. The value of erythrocyte index after consuming guava juice increased compared to before consuming guava juice. This is due to the content in red guava fruit such as iron, vitamin C, amino acids (tryptophan, lysine), calcium, phosphorus, sulfur, vitamin A and vitamin B1 [8]. Red guava contains vitamin C two to four times higher than oranges so it can help the absorption of iron [6, 7]. In addition, vitamin C will also help increase the absorption of non heme iron by up to fourfold [13]. Red guava fruit also contains of amino acids, where amino acids and vitamin C will help the process of reduction of the ferrite form (Fe +++) to fero (Fe ++) so that iron is easily

absorbed. Vitamin C will also help remove iron from transferrin in the plasma in order to join into ferritin tissue.

The dietary needs of young women in the day for protein is 48-62 g, 19-26 mg of iron, vitamin B6 1.25 mg and vitamin C 60 mg. Fe is an essential ingredient in the formation of hemoglobin. Healthy human body contains ± 3.5 g Fe are almost entirely in the form of complex bonds with proteins. Approximately 70% Fe in the body is functional and 30% Fe rest is nonessential. Fe functional/essential is present in ± 66% of hemoglobin, myoglobin 3%, an enzyme that serves to transfer electrons (sitokromoksidase, succinyl dehydrogenase, xanthine oxidase) as much as 0.5% and 0.1% transferrin. Iron non-essential there as a backup in the form of ferritin and hemosiderin as much as 25% and in the parenchymal tissue of approximately 5%. parenchymal tissue of approximately 5%. Iron that has been absorbed in the form of ferrous ions will be converted into a ferry in the mucosal cells which will then be entered into with intermediaries plasma transferrin, ferritin will then be converted into and stored in the intestinal mucosa. vitamin B6 along with the enzyme Aminolevulenat change Succinyl-CoA synthase and glycine into aminolevulenat acid (ALA). Furthermore, ALA will be condensed by ALA dehydratase enzyme to form two molecules of water and one molecule of porphobilinogen. This porphobilinogen be synthesized to be protoporphyrin III. The involvement of iron in hemoglobin synthesis process is in the final stages of heme formation, where the merger of ferrous iron into protoporphyrin III catalyzed by the enzyme ferroketalase [14].

Any increase in frequency of vitamin C consumption once (100 grams of red guava) will increase the hemoglobin level by 0.06 g / dl. This is in line with other researchers' claims that vitamin C increases the absorption of iron non heme by four times more than those who do not consume vitamin C. So it has a positive relationship where there is a higher tendency of iron consumption higher Hb level (each addition of 1mg of iron consumption of Hb added 0.0365 g / dL). Vitamin C can increase the acidity so it can help the absorption of iron in the stomach. This vitamin C can increase iron absorption by 30%. In red guava fruit contains compounds that can increase hemoglobin levels in the blood, among others: iron, vitamin C, vitamin A, copper and phosphorus [15].

Red guava also contains antioxidants such as flavonoid compounds, a combination of saponins with oleanolic acid, guaijavarin, and quercetin [16]. The activity of these antioxidant compounds can be affected by the level of maturity, part of fruit, and the varity of guava. Mature red guava has higher antioxidant activity compared to perfectly immature fruit. In addition, fruit flesh with seeds have higher antioxidant activity than fruitless fruits. Antioxidant compounds in red guava also affect the erythrocytes, one of which is flavonoids. Flavonoids are compounds of phytochemicals that are divided into several classes such as flavones, flavonols, flavanones, and isoflavones. Flavonoids help in preventing the adverse effects of free radicals. Flavonoid compounds react directly with free radicals, where unpaired electrons in free radicals are captured by flavonoids without producing other free radicals as a result of the reaction. The erythrocyte membrane is one of the cell membranes susceptible to free radical attack. If free radicals attack the erythrocyte membrane, the fluidity of the cell membrane will be disrupted which can cause lysis and even cell death so that there will be changes in the amount of erythrocytes and hemoglobin levels. This results in a decrease in the number of erythrocytes. Therefore, by consuming red guava juice containing flavonoids can affect the increase in the number of erythrocytes and hemoglobin [11, 17].

Guava juice with sufficient doses can improve iron reserves in the body. Improvement of iron reserves will increase the formation of Hemoglobin levels, but it can also be through the transport of iron by blood transferrin to be brought to the bone marrow and other body parts which then iron will be used to form hemoglobin in the spinal cord. Bone marrow also requires precursors such as iron, vitamin C, vitamin B12, cobalt and hormones for the formation of red blood cells and hemoglobin so as to increase the amount of erythrocytes and hematocrit levels. Therefore, with red guava juice is expected to improve the erythrocyte index and reduce the incidence of anemia, especially iron deficiency anemia in adolescent women.

IV. CONCLUSION

The consumption of red guava juice can improve the erythrocyte index an prevent anemia in adolescent girls.

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Reliability of Nutriatlet Application as Dietary Assessment Method for Athlete

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***Abstract*—Nutrition intake assessment needed as an early detection of athletes' nutrition problems. Therefore, it was required the modification of conventional consumption survey method to obtain nutrition intake data fast and reliable. The objective of study was to test suitability of consumption survey with "Nutriatlet" application and 24-h recalls. Consecutive 7-day consumption survey has conducted to 59 martial arts athletes. 24-h recall done by nutritionist, while Food record with "Nutriatlet" done by athlete themself. Conformity test of 2 methods done with kapa and Bland Altman. Kappa value was 0.92 (p<0.0001) showed Nutriatlet application reliable as a survey instrument of consumption.**

Keywords—"nutriatlet", dietary assessment, athlete

I. INTRODUCTION

The success of an athlete in reaching sports achievement is supported by many factors. Nutrition is one of the important factors in reaching sports achievement. Physical exercise programs and sports techniques will not be optimal without the support of nutritional intake that suitable the needs of athletes. The nutritional need for athletes include adequate intake of both macronutrients and micronutrients. Adequate nutrient intake provide sufficient energy supply for athletes during training and competition. Similarly, the intake of micronutrients is needed by the body in the process of metabolism. Therefore, it is very important to include nutritional factors as part of an athlete coaching program[1].

The importance of nutrition in supporting sports achievement, so the assessment of nutritional intake is an important activity that must be done. Assessment of the athlete's nutritional intake is an attempt to early detection of possible nutritional problems in athletes[2]. Early detection effort is an important part of a surveillance of nutritional problems in athletes. Surveillance is a continuous series of data collection activities, followed by processing and analyzing data, dissemination of results, and provision of feedback for the development of athletes nutrition program[3]. In Indonesia, nutrition surveillance in athletes is generally not well done. In some sports training center institutions conducted by government there is no athlete nutrition surveillance activity. The absence of nutritional surveillance cause early undetectable nutritional problems.

The lack of early detection nutritional problems in athletes raises the data of athletes with less nutrition and more nutrition. The preliminary study on sports athletes in Central Education Association of Sport Training Student Central Java Province showed 8% of athletes have less nutrition (BMI <18.5 kg / m). The study also revealed that the average energy consumption level of athletes only reached 74% of the recommended energy demand.

Under nutrition problem data and the lack energy intake mentioned above, clarify the need for early detection of nutritional problems in athletes. There are many sports training institutions in Indonesia are unable to assess nutritional intake due to limited fund, time and energy of surveyors [4]. Individual consumption surveys with standard methods, 24-hour recall require trained surveyors. On the other hand the estimated food record method also requires athletes who have nutritional literacy[5]. Therefore, an alternative method of consumption survey is required to overcome these limitations.

Because of assessment need of nutritional intake that is capable for athletes in the Central Education Association of Sport Training Student of Central Java Province, so researcher has developed a method of assessment of nutritional intake based on android called "Nutriatlet". The "Nutriatlet" application adopts and modifies the estimated food record method. The objective of this study was to examine the suitability of nutritional intake assessment method between "Nutriatlet" application with 24-h recalls method.

II. MATERIALS AND METHODS

A. Research Design

This research is part of a development study to develop a nutritional application called "Nutriatlet". The development research procedure is done with 9 steps: (1) preliminary study. (2) research planning. (3) early product development. (4) limited field test. (5) revision of limited field test results. (6) more extensive field tests. (7) revision of field test results. (8) feasibility test (9) revision of feasibility test result.

The application reliability assessment of "Nutriatlet" as a method of assessment of nutritional intake of athletes is one of the results of step 3, namely product development.

Software Development

This "Nutriatlet" is a software based on smart phones android. This application has 7 menu, include 1) personal data of athlete, 2) calculation of energy requirement, 3) meal planning, 4) nutritional assessment, 5) nutrition assessment with anthropometry, 6) data report, and 7) export data.

One menu in the Nutriatlet application, namely nutritional assessment is used as an instrument for the assessment of nutritional status by consumption survey. The nutritional assessment menu in this instrument is a modification of the estimated food consumption survey method. Modifications include 3 things: 1) food items 2) the size of food consumed, 3) how to input data, 4) analysis of the results of recording food.

B. Study Participant

After the development of Nutriatlet application product got validation from expert, then trial to the application of nutriatlet. This trial is intended to measure the application properness from user side. Total of 30 martial arts athletes at Sport Student Training Central of Yogyakarta Province are involved to test and fill in the User Experience Questionnaire. To measure the reliability of Nutriatlet application as an assessment method of nutritional intake of athletes conducted a survey of consumption to 59 sports athletes in Central Education Association of Sport Training Student martial arts Central Java Province

C. Dietary Assessment

A food consumption survey using a 24-hour recall method done by nutritionists for 7 consecutive days by recording the type and amount of food consumed by athletes over the past 24 hours. With this method, respondents were asked to tell what was eaten and drunk during the past 24 hours (yesterday). Food and beverage intake data are recorded from the time during the interview backwards up to 24 hours in advance. After the interview is completed, 24-hour recall data is converted from household size (URT) to weight size (gram). The process of estimating into the gram size the interviewer uses various tools such as household size samples (plates, cups, spoons and so on) or food models[6].After the list of consumed foods obtained, energy intake analysis was conducted using Indonesian Food Composition Table. Further energy intake data is compared with the total energy needs of individuals, so that the data obtained energy consumption level of each athlete.

Consumption surveys are also done by each athlete using the Nutriatlet application. During the same 7 days, each athlete also recorded their own food and beverage intake. With the Nutriatlet application each athlete notes all food consumed for 24 hours into the "nutritional assessment" menu. Through the menu athletes can fill the food consumed in units of exchangers or weight in grams that will automatically be converted in the form of energy. Furthermore, automatically the results of recording intake of food and beverages are analyzed so that it can be presented total data intake of calories and also the level of energy consumption.

D. Statistical Analysis

The user feasibility test results data are analyzed descriptively. Consumption survey results were analyzed both univariate and bivariate. Reliability analysis of Nutriatlet application was performed using Bland Altman test.

III. RESULTS AND DISCUSSION

The nutriatlet application has been tested to 30 martial arts athletes at the Sport Student Training Central of Yogyakarta Province using the User Experiences Questionnaire (UEQ) in Table 1 below. This instrument aims to measure and evaluate the feasibility of the product. This questionnaire has 6 scales with a total of 26 elements. User Experience Questionnaire consists of a pair of opposite attributes that can present a product. The circles between the attributes represent the gradations between opposing attributes.

The measurement scale used in the UEQ includes 6 aspects: attractiveness, efficiency, perspicuity, dependability, stimulation, and novelty[7].

The figure 1 are the results of user feasibility trial: From these results the average value of the impression is 1.751, the value between -0.8 and 0.8 indicates a normal evaluation of the appropriate scale. The impression value > 0.8 is a positive evaluation and the value < -0.8 is a negative evaluation. From the 6 UEQ scores showing > 0.8, this indicates that the Nutriatlet application tends to have a positive impression value approaching to 3) [8].

From Figure 1, the results of the perceptions showed that the attractiveness, dependability, and novelty aspects were categorized as excellent, while the efficiency, and stimulation aspects were good. The scale of perspicuity was categorized above average. This indicates that the results of this application product was feasible to use.

A. Respondent Characteristic

Table 2 showed the characteristics of athletes involved in the study. Most of the respondents were male (55.9%). Based on the sport, the athletes involved in the research spread the same relative to 7 sports, include wrestling, wushu, karate, taekwondo, boxing, silat, and judo. Total 20.3% of respondents were boxing and silat athletes. According to the body mass index, 30.6% of respondents had a normal body

mass index, but there were 3.4% of respondents with a very thin body mass index.

The distribution of data from 59 athletes involved in the study by sex for weight, height, BMI, and energy needs variables is seen in the boxplots at figure 2

TABLE I. USER EXPERIENCE QUESTIONNAIRES

	1	2	3	4	5	6	7		
difficult	○	○	○	○	○	○	○	Fun	1
Can't be understood	○	○	○	○	○	○	○	Can be understood	2
creative	○	○	○	○	○	○	○	Monotonous	3
Easy to learn	○	○	○	○	○	○	○	Difficult to lear	4
useful	○	○	○	○	○	○	○	Less useful	5
boring	○	○	○	○	○	○	○	Fun	6
Not intresting	○	○	○	○	○	○	○	Intresting	7
Can't be predicted	○	○	○	○	○	○	○	Can predicted	8
fast	○	○	○	○	○	○	○	Slow	9
inventive	○	○	○	○	○	○	○	conventional	10
blocked	○	○	○	○	○	○	○	Support	11
good	○	○	○	○	○	○	○	Bad	12
complicated	○	○	○	○	○	○	○	Simple	13
dislike	○	○	○	○	○	○	○	Happy	14
usual	○	○	○	○	○	○	○	Lead	15
uncofortable	○	○	○	○	○	○	○	comfortable	16
safe	○	○	○	○	○	○	○	Not safe	17
motivate	○	○	○	○	○	○	○	Not motivate	18
Fulfill expectation	○	○	○	○	○	○	○	Not fulfil expectation	19
Not efficient	○	○	○	○	○	○	○	Efficient	20
clear	○	○	○	○	○	○	○	Confusing	21
Not practical	○	○	○	○	○	○	○	Practical	22
organized	○	○	○	○	○	○	○	Messy	23
atractive	○	○	○	○	○	○	○	Not atractive	24
User friendly	○	○	○	○	○	○	○	User unfriendly	25
conservative	○	○	○	○	○	○	○	Inovative	26

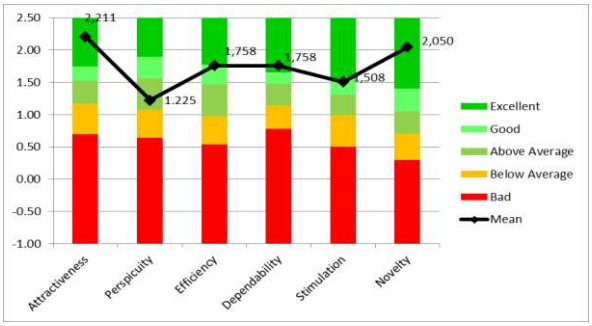


Fig. 1. Result of Perceptional Assessment and Impression Scale Average

Based on the boxplot at figure 2, the distribution of weight and height data according to sex was normally distributed, whereas BMI and energy needs were not normally distributed, due to outliers. The mean (Standard Deviation) weight, height, Body Mass Index, and energy needs of male and female athletes were 62.18 (8.52) and 54.41 (6.85), 167.37 (6.26) and 158.75 (6.58), 21.67 (2.59) and 21.08 (2.24), and 5025.91 (1151) and 3783.85 (1437).

Figures 3 and 4 showed the distribution of energy intake (KiloCalories) and energy consumption level (%) of athletes by sex. The mean (Standard Deviation) energy intake measured by food record in Nutriatlet in male and female athletes was 3464.3 (717.4) and 2694.5 (905,4), while the measured food recall was 3472 , 2 (722,8) and 2694,2 (919,3). In the energy consumption level parameters, the mean (Standard Deviation) measured by food record in Nutriatlet in male and female athletes were 69.49 (5.13) and 72.56 (1.73), while those measured by food recall was 69.61 (5.04) and 72.39 (1.31).

TABLE II. CHARACTERISTIC OF RESPONDENTS BY SEX, SPORT, AND BMI CATEGORY

Variable	Total	Percentage
Sex		
- Male	33	55,9
- Female	26	44,1
Sports		
- Wrestling	8	13,6
- Wushu	6	10,2
- Karate	6	10,2
- Taekwondo	9	15,3
- Boxing	12	20,3
- Silat	12	20,3
- Judo	6	10,2
BMI Category		
- Severely Underweight	2	3,4
- Underweight	3	5,1
- Normal	36	61,0
- Overweight	9	15,3
- Obesity	9	15,3

B. Analysis of Reliability of Nutriatlet Applications

The Bland Altman graph is a scatter diagram between the measurement averages (x axis) and the difference (y-axis). Most of energy consumption level data were spread between the 2 upper red lines at the value of 1,295 (mean difference + 1.96 x Standard Deviation average difference) and bottom at -1.292 (average difference - 1.96 x Standard Deviation average difference). There is only 1 data outside the red line. Blue line is the average difference of energy consumption level data as measured by food record in Nutriatlet and food recall by nutritionist, is in value 0.002. Bland Altman plot is presented in figure 5.

Based on the result of one sample t test, the mean difference of 2 methods of measuring daily energy intake was 0.002 (-0.17 till 0.17). The value of p was 0.98 which showed that statistically the mean of energy consumption level difference is not different from 0.

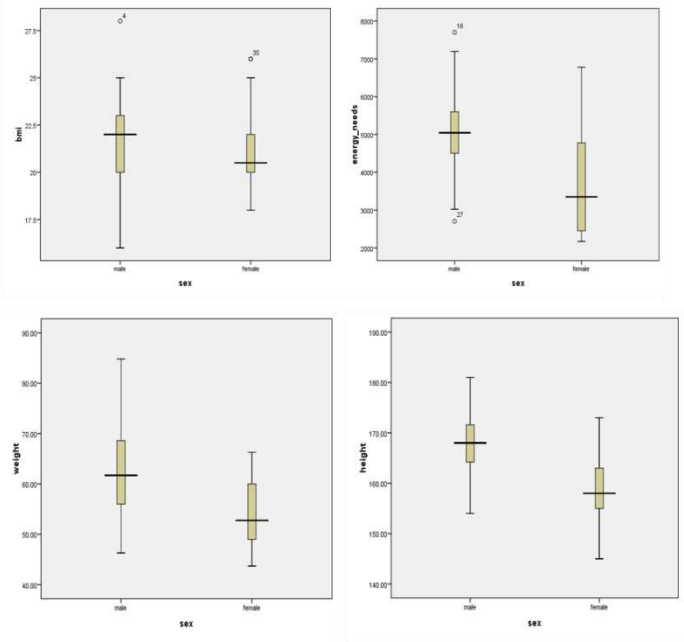


Fig. 2. Data distribution of body weight (kilogram), height (centimeters), BMI (kilogram per square meter), and energy demand (calories) of athlete by sex

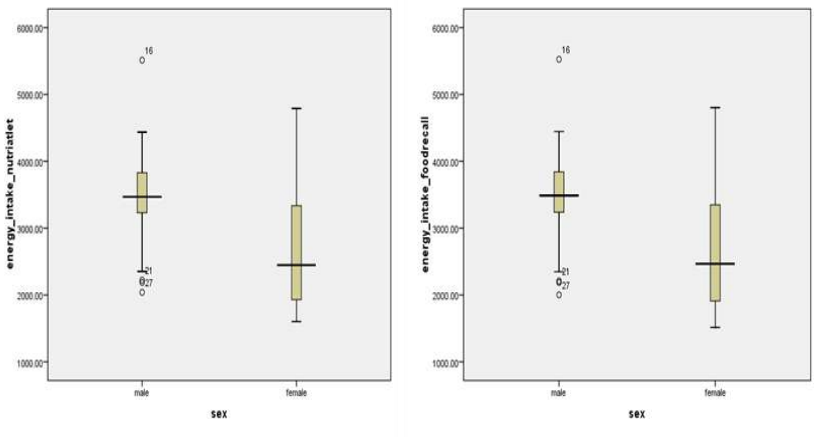


Fig. 3. Distribution of energy intake (KiloCalories) of athletes that measured by food record in Nutriatlet and food recall 24 hours by nutritionist according to sex

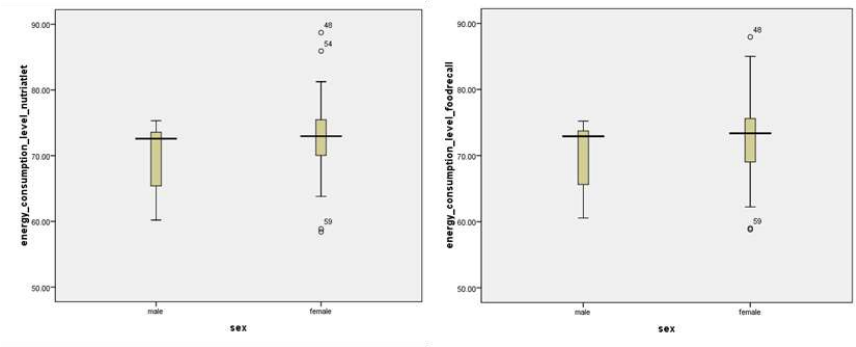
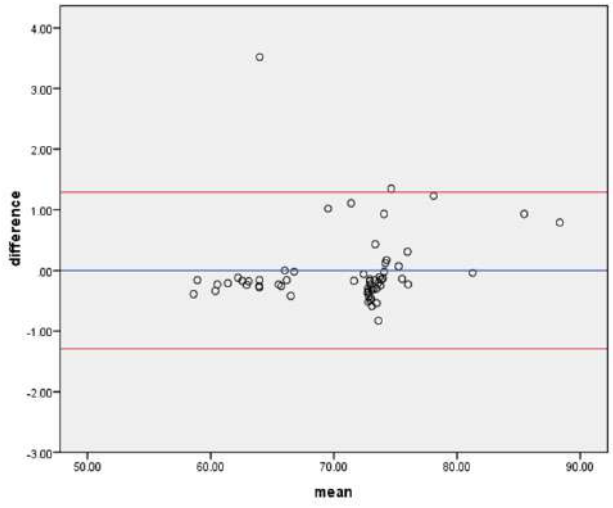


Fig. 4. Distribution of energy consumption level (%) of athlete that measured by food record in Nutriatlet and food recall 24 hours by nutritionist according to



sex

Fig. 5. Bland Altman Plot of reliability energy consumption level measured by food record in Nutriatlet and recall 24 hours by nutritionist

TABLE III. CROSSTABS ENERGY CONSUMPTION LEVELS MEASURED WITH FOOD RECORD IN NUTRIATLET WITH 24-HOUR FOOD RECALL BY NUTRITIONIST

			Energy consumption level dengan foodrecall		Total	Kappa	p-value
			≥ 70%	***< 70%***			
Energy consumption level dengan Nutriatlet	≥ 70%	Total	38	1	39	0,92	<0,0001
		% from total	64,4	1,7	66,1		
	< 70%	total	1	19	20		
		% from total	1,7	32,2	33,9		
Total	Total		39	20	59		
	% from total		66,1	33,9	100		

Table 3 showed the suitability of Kappa energy consumption levels that measured by the food record in Nutriatlet with a 24-hour food recall by nutritionists. A total of 96.6% measurements result similar outcome (concordant cells). Meanwhile, as many as 3.4% of the measurements gave different results (discordant cells). The Kappa value between the two measurements was 0.92 (p <0.0001). Thus, it can be concluded that the energy consumption level measured by the application of Nutriatlet has a very good suitability with food recall by nutritionists.

The results of the analysis on the UEQ test (User Analysis Questionnaire) showed the average value of impressions was 1.751. The value > 0.8 indicated that the Nutriatlet application tends to have a positive impression (value approaching 3)[7].It also showed that the application of Nutriatlet was feasible to be used in terms of attractiveness, efficiency, perspicuity, dependability, stimulation, and novelty.

In accordance with Kirkpatrick's study, the used of an application for nutrient consumption surveys should consider the convenience aspects of its use[9]. Compared with conventional consumption survey methods, in Nutriatlet applications there is an analysis of energy intake and nutrients. In the application of Nutriatlet has the availability of database of food and energy content. The foodstuff database also includes household size conversion.(plates, bowls, spoons, glasses) into units of weight (grams). The app is designed to be able to assess food by serving portion sizes into units of weight (grams) to make it easier for users to fill up independently without the help of a nutritionist.

The Nutriatlet application as an instrument survey for nutrient consumption was expected to overcome the problem of limited fund and surveyor on surveys using conventional methods. Research from Freisling and Aziz states that the use of a new alternative method needs to be tested reliability first. If the method is reliable against the standard method that has been used, then the method can be recommended its use[5], [10].

The result of Kappa and Bland Altman conformity test showed that there is a suitability between dietary assessment by applying Nutriatlet and recall 24 hours. The result of one sample t test with p value obtained was 0.98, and Kappa value of 0.92 (p <0.0001) showed that nutriatlet application could be a reliable alternative dietary assessment.

IV. CONCLUSION

Based on Kappa and Bland Altman conformity test results it can be concluded that there is a suitability of nutritional intake assessment method between Nutriatlet application with 24-h recalls method. The existence of such suitability means that the application of Nutriatlet is a reliable method for assessment of nutritional intake of athletes.

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Optimizing Growth of Toddler Children Through Nutrition Counseling

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***Abstract*— In Bandung district, toddler with status less body weight as much as 10355 toddlers (3.72%) and who experienced very less weight (< 2.5 kg) is as much as 810 toddlers (0,25%). Therefore, need for nutrition counseling. Research is done by qualitative approach using Q short method. The aim research is to know the type of nutrition education needed by integrated service post (commonly called Posyandu) managers in Bandung district. Q-short results followed up with counseling on 81 posyandu managers, is a representative of posyandu managers from 31 sub districts. The result of need assessment showed that nutritional counseling needed were knowledge of toddler growth (28,39%), processed milk substitute feed (26,54%) and disciplined pregnant mother and toddler came to Posyandu (22.22%). The result of the research shows that there is an increase of post nutrition nutrition knowledge which is average result of pretest value is 43,57 whereas average result of posttest is 76,28 so that there is increase of knowledge equal to 32,71%. Skill required by posyandu manager that is processing mother's milk substitute food namely liquid food, soft food and cookies of beans supplemented by rice bran as source of vitamin B1, while to discipline the presence of toddlers and pregnant women is made "Control Card" so that more orderly come to Posyandu in order to support policy ' Healthy Village ".**

Keywords*— *method of Q short, posyandu manager, breastmilk substitute, control card, peanut cookies

I. INTRODUCTION

The growth of the child begins in the womb, since the baby therefore the government policy through integrated service post (commonly called Posyandu) program, monitor the development of pregnant mother up to 5 years old baby child, in order to improve nutritional status, monitor growth and monitor health. Posyandu is managed by Family Welfare Development (PKK) mothers whose meetings are conducted once a month in Posyandu posts, with a minimum agenda of weight weighing, height measurement, arm circumference, pregnant women examination, and if there are government programs such as vaccination performed simultaneously with the monitoring. Family Welfare Development, abbreviated PKK, is a community organization that empowers women to participate in the development of Indonesia. As resource persons, sometimes posyandu managers bring Midwives or Doctors from the nearest Public Health Centers (Puskesmas).

Protein is a nutrient that is needed in the growth of toddlers, chemically, the type of protein is divided into essential and non-essential protein and animal and vegetable protein. Protein deficiency results in underfive nutritional status, less intake of daily needs to make children less susceptible to nutrition. In the year 2017 in Bandung District, the number of toddlers is 278,173 under five years old, with status less body weight as much as 10,355 toddlers, or 3,72% and who experience very less weight is as much as 810 toddlers or 0,25% (source of Bandung District Health Office, 2017). Toddlers with weight less nutritionally prone, prone to disease, and if the toddler lacks protein then can experience marasmus and khuarshiorkor, the long-term impact is the quality of human resources to be low. Nutrients and growth factors regulate brain development during fetaland early postnatal life.

Micronutrient malnutrition remains one of the largest nutritional problems worldwide, affecting people in both developed and developing countries. Children are particularly vulnerable to micronutrient deficiency owing to their high nutrient requirements for growth and susceptibility to infectious diseases such as diarrhoea andrespiratory infections, which can inhibit nutrient absorptionas well as decrease appetite. The nutrient density of the diet given to young children is often insufficient to meet their nutrient requirements, and increasing the diversity of foods provided to young children, particularly meat,poultry, fish, eggs, fruits and vegetables, is recommended to improve micronutrient intakes [1].

Therefore, health, nutritional status of children under five must be monitored through Posyandu. To facilitate the posyandu manager then made KMS (Card Towards Healthy) which form is a graph sheet which is the intersection between body weight and height consisting of three parts, namely the curve under the red color means malnutrition status, then the yellow color means to get ready begin to experience growth and green color means very healthy toddler. This kind of health monitoring is very simple and easy for Posyandu managers.

For toddlers the main consumption is protein as a builder, forming new cells or replacing damaged cells. Adequate nutrition is necessary from the beginning, with the formationof the neural plate and neural tube affected bynutrients such as folic acid, copper, and vitamin A. Seven weeks after conception, cell division begins within the neural tube, creating nerve cells (neurons) and glial cells (cells that support neurons). After a neuron is created, it migrates to its place in the brain, where it then grow saxons and dendrites projecting out from its cell body. These branching projections make connections with other cells, called synapses, through which nerve signals travel from one cell to another [2].

Children under 5 years fail to reach their potential in cognitive development because of poverty, poor health and

nutrition, and deficient care [4]. The discrepancy between their current developmental levels and what they would have achieved in a more nurturing environment with adequate stimulation and nutrition indicates the degree of loss of potential [3].

Based on the results of the nutrition program activities in 2016, it can be seen from the coverage of monthly growth monitoring result at posyandu that is the scope of community participation to bring the toddlers to come and be weighed in posyandu (D / S coverage) has not reached the target of 81,7% (target 2016 equal to 87 %),while the data of nutrition status of balita is very thin (malnutrition) year 2016 equal to 0,039% (as many as 107 children) when compared to year 2015 there is decrease equal to 0,003% as well as toddler stunting year 2016 equal to 6,80% decrease 2,09%.Most of the malnutrition cases are malnourished due to the pattern of care and lack of knowledge and skill of mother toddler on how to feed her child.It is certainly necessary to deliver information to mothers who have a toddler about healthy food for their children (Source Bandung District Health Office, 2017). From this problem it is necessary to think about appropriate nutrition counseling given to the posyandu managers in order to decrease the number of children under five who suffer from malnutrition and nutrient prone.

II. MATERIAL AND METHOD

The research was conducted by qualitative approach using Q-short method. The aim of this research is to know the type of nutritional counseling needed by Posyandu managers in Bandung district, by first inviting each district to be represented by 3 Posyandu managers. Bandung regency consists of 31 sub districts, with a total attendance is 81 people. The results of the analysis using the Q-short method, followed by counseling on Posyandu managers. The instruments used were questionnaires, pre test and post test .

III. RESULTS AND DISCUSSION

A. Needs Analysis Process

Needs analysis activities conducted at the District Health Office of Bandung, by first inviting each district to be represented by 3 Posyandu managers. Bandung regency consists of 31 sub districts, with a total attendance is 81 people. The needs analysis activities are assisted by health department staff, with the following stages:

1. Requirements Analysis Phase

Participants were given a 10X10 Cm paper size to write down the perceived problems during Posyandu management. The results are collected and analyzed there are 6 main problems that is 1) discipline pregnant mother and toddler come to Posyandu, 2) knowledge about preparing menu for toddler, 3) processing food for toddler as substitute of milk, 4) build healthy village, 5) knowledge about growth toddlers and 6) knowledge of cultivation of plants to meet family needs.

2. Stage method Q short

Conducted by giving the marbles to each participant as much as 2 points, then selected 3 main problems that are very important to be followed by the way that is on the table placed 6 glasses as a symbol of 6 problems. Each participant is given the opportunity to put the marbles into the glass problem according to the perceived problems, then selected 3 glasses of the most problem marbles. The results of Q short indicate important issues that are followed up, namely knowledge of the growth of 46 children (28.39%), milk substitute feeding of 43 marbles (26.54%) and discipline pregnant women and toddlers coming to Posyandu with 36 marbles (22 , 22%).

3. Preparation of the Follow-up Action Plan

Following the participatory extension phase, after obtaining the needs analysis, the preparation of Follow-Up Action Plan (RTL) is needed to carry out the activities to solve the problems faced by the Posyandu managers. The results of the agreed follow-up plan are:

a) Develop education and training schedule as follows:
   - August 2018 Tuesday the second week of training, growth of toddlers
   - September 2018 on Tuesday of the second week, Demonstration of milk substitute food processing
   - October 2018 on Tuesday the second week, training discipline pregnant women and toddlers come to Posyandu.

b) Speaker needs done by bringing in sources
c) Financial needs are done by donating each sub-district after the calculation of the cost requirements of the three activities.
d) Each delegate of each sub-district prepares a draft report and is willing to disseminate to each village all the results of this activity.

The results of the preparation of the follow-up plan is a series of activities undertaken to answer the main problems faced by the posyandu managers in Bandung regency.

B. Increased Knowledge of Growth of Toddlers

The activity of knowledge improvement of toddlers growth is the main problem faced by the posyandu management. This happens because the question often arises from the mothers about how to make their children healthy, so that their children are smart, so that their children are active and so on, so for this activity a day training invites competent resource persons to discuss the growth of toddlers with the following materials:

1) Toddler brain development : Brain development is complex and ongoing throughout childhood and adolescence, with a time course that varies depending on the outcome considered. Parts of the neural tube are developed just 5 weeks after conception, and development of the cortex is evident by midgestation [4]. The weight of the brain is related to body weight, big people have bigger brains than small people. The task of the brain controls the most complex body functions, the brain is one of the first organs to grow before birth. Three weeks after the fertilization of the egg, the neural tube begins to form, with the nerve ends expanding and emerging three lumps. The first lump becomes the cerebrum, the place of

intelligence and the senses, and the thalamus, the center of the relay of messages. The second lump will become the midbrain, which is a collection of nerve fibers that serve as a bridge to connect various parts of the brain. The third lump grows into a cerebellum, which controls muscle movements, pons (bridges), connecting nerves to different parts of the brain, and the medulla oblongata (controlling marrow) that controls its own functions of respiration, blood circulation, and digestion. According to Gandhel C. and Simons C [5], brain development is very rapid in toddlers, ie at age 1 year the weight rose to 700 grams, at age 2 years to 900 grams, at age 3 years to 1100 grams, at the age of 4 years became 1200 grams, at the age of 5 years to 1250 grams and after a human adult brain weight between 1300-1400 grams, because the growth of the brain in infancy is very important to optimize.

Optimizing the growth of toddler's brain can be done by fulfilling protein requirement every day in amount and type needed that is at age 0-6 month as much as 10 gram and when aged 4-6 years protein requirement a day is 110 gram. Complete protein is an animal protein, contains both essential and non essential amino acids and has a high biological value, therefore it is recommended that children more often be fed with animal protein dishes. Breast feeding until the age of 2 years is one of the fulfillment of protein needs for the body of a toddler, brain defects due to lack of protein during toddlers can not be fixed.

Cognitive development is influenced by many factors, includ- ing nutrition. There is an increasing body of literature that suggests a connection between improved nutrition and optimal brain function. Nutrients provide building blocks that play a criti- cal role in cell proliferation, DNA synthesis, neurotransmitter and hormone metabolism, and are important constituents of enzyme systems in the brain Brain development is faster in the early years of life com- pared to the rest of the body Since rapid brain growth occurs during the first 2 years of life (and by the age of 2 the brain reaches 80% of its adult weight), this period of life may be particularly sensitive to deficiencies in diet [6].

2) The development of toddlers body : Knowledge of the development of toddlers is needed by the posyandu managers, because they often get the question, when the baby is born healthy, it turns out in its development so autistic, so hyperactive, experiencing undesirable abnormalities. According to Gandhel C. and Simons C [5], at the age of 20 days the baby begins to stare at bright light or color, at the age of 1 month the baby starts to say "ah, oh" and smile, at the age of 2 months the baby starts staring at his own hands and sucking fingers, at the age of 3 months the baby can hold and shake the toy, at the age of 4 months then the baby moves his head staring at others. At the age of 5 months, the baby begins to lift his head, stuck his arms, at the age of 6 months then the baby can sit, at 7 months of age the baby can crawl, at 8-9 months old baby can grasping spoon, food, at the age of 10-11 months the baby can stand, walk while holding on to the object and the age of 12 months the baby can walk.The development of infant weight at birth, weight between 2.7-3 kg, at the age of 1 year weight 7.5 years, at the age of 1-3 years weigh 13.4 kg and when aged 4-6 years weighs 20.2 Kg. To optimize the movement and weight of toddlers, the food sources of energy substances, source of builders and sources of regulating substances are needed in the appropriate quantities and types.

The government's policy of consuming 4 healthy 5 perfect is in order to optimize optimum growth. As expected, cognitive, language, and behavioral concerns are more likely to be identified as the infant develops into toddlerhood, when there are greater expectations of the child and more-complex and more frequent interactions with the outside world than duringthe early months. Therefore, although we controlled for the age of the children at the time of examination,caregivers of toddlers were more likely to report that the children were at developmental risk than were caregivers of younger infants. In addition, birth weight, health,and gender are factors that were found in many other studies to influence development, particularly for children living in poverty, depending on the developmental outcome measured. Consistent with the work of others,children in this sample who had low birth weights,had been previously hospitalized, and were male were more likely to be at developmental risk than were children who had normal birth weights, had not been hospitalized,and were female. Caregivers who were notborn in the United States and caregivers who were employed were less likely to report that their children wereat developmental risk than were caregivers in the contrasting groups.During the first 3 years of life, when brain growth israpid,In a time of limited resources, providing nutritional and developmental interventions to young children and their families is aproactive step that might decrease the need for later,more-extensive interventions for developmentally orbehaviorally impaired children of school age [7].

C. Food Processing Training of Breast Milk Substitute (MPASI)

Breast Milk (ASI) is the perfect food for babies, according to Bayu [8], Gold standard of children's intake is at 0-6 months of age only breastfed, age 6 months starting MPASI with 30% MPASI balance, ASI 70%, age 7 -8 months of nutritional fulfillment with the balance MPASI 40% breast milk 60%, age 9-12 months balance 50% breastfeeding and 50% MPASI, at age 12-24 month balance 70% MPASI and 30% milk, and more 24 month 100% . At this time, on the market many sold in the form of ready-to-eat food, but the content of food additive can affect the growth of physical and brain development of the baby, therefore need training MPASI training is natural.

The result of the observation to the participants shows that they are not yet know and skilled in processing the MPASI. Therefore, the training is a demonstration of 3 types of MPASI namely the processing of filtered food, soft foods and processing of peanut cookies [9]. Processing of liquid food according Nataliningsih [10], raw material filtered food that is 250 ml fresh milk, cornstarch 20 grams, ati chicken 1 seed, half egg grains. Raw food raw material that is 50 grams of rice, ati chopped 1 seed, grated carrots 25 grams, 25 grams of chopped tomatoes. Processing of nuts cookies with red bean flour raw materials: green beans: peanut tolo: rice bran at a ratio of 30:

30: 30: 10.Cow's milk is not recommended during the first 12 months of life.10,11 However, fortifiedcow's milk is an important dietary componentof a toddler's diet because of its high quality protein, calcium, and vitamins Aand D. Calcium is involved in bone growth,tooth development, and muscle contraction,and it may play a role in the regulation ofblood pressure and body fat. One study showed thatchildren who consumed milk with the noontime mealwere the only group to meet or exceed 100 percent of thedaily Dietary Reference Intake for calcium (i.e., 500 to 800 mg). Two or three servings of milk or dairy productsper day are recommended to meet these requirements.14 Some toddlers are poorly weaned from a nall-milk diet and consume more than the recommended number of servings; this "milk diet" is high in fat andtotal calories and inadequate in iron [11].

According to WHO, exclusive breast-feeding is generally adequate for the first 6 mo of life . Thereafter, mother's milkalone cannot be expected to provide all the micronutrientsneeded for the growing infant. Nutrients that have been identified as potentially ''problematic'' for breast-fed infants after6 mo of age are iron, zinc, vitamin A, and vitamin B-6. VitaminB-6 concentration in milk is influenced by the maternal diet, so ifthe mother's diet is adequate, the milk concentrations are likelyto be adequate.Iron and zinc are critical for immune function, neurocognitivedevelopment, and postnatal growth. As noted above, milk concentrationsof these micronutrients are relatively resistant to the maternal diet. Hence, the breast-fed infant is particularly dependenton complementary foods containing iron and zinc after6 mo of age. Without consistent intake of these micronutrients from complementary foods or other sources, the infant maydevelop physiologic manifestations of micronutrient deficiency [12].

D. Training on Increasing Motivation of Pregnant Women and Toddlers come to Posyandu

The result of the agreement during the training on increasing the motivation of pregnant mother and toddler to come to Posyandu is by making "Control Card" which contains the attendance table to the next posyandu, as well as the information that need to be recorded in the card, next as the note below given additional if not attending to posyandu then as punishment is visited home and fined, the money for cash of posyandu. This agreement needs to be expected that initially compulsory trials will become a habit, if posyandu advanced which is indicated by high attendance level of pregnant mother and toddler this can support government policy that is "Healthy Village".

Low attendance motivation is caused by several things, including mothers who leave for work, feel the baby is healthy so do not need to be examined, less concerned with the presence of posyandu. Therefore, the increased attendance motivation to posyandu needs to be improved to support government programs to improve the public health index through programmable vaccination movement, so that the community is free from endemic diseases such as smallpox, diphtheria, polio, hepatitis and so on.

The discrepancy between their current developmental levels and what they would have achievedin a more nurturing environment with adequate stimulation and nutrition indicates the degree of loss ofpotential. In later childhood these children will subsequently have poor levels of cognition and education,both of which are linked to later earnings. Furthermore,improved parental education, particularly of mothers, isrelated to reduced fertility,2,3 and improved child survival health, nutrition, cognition, and education [3].

Nutrient deficiency and experiential input from the environment may have independent additive effects on brain development. In this case, in anat-risk population, one would expect children with bothrisk factors (nutrient deficiency and low stimulation) to perform at low levels, children with one risk factor(nutrient deficiency or low stimulation) to perform ataverage levels, and children with neither risk factor (sufficientnutrition and high stimulation) to perform athigh levels in cognitive, motor, and socioemotional development. Insupport of this hypothesis, several studies have shown that nutritional supplementation and psychosocial stimulation together result in greater improvements inchild development than either intervention alone.49,50 In these studies, psychosocial stimulation consisted of periodichome visits during which community workers facilitated play sessions with mothers and children. The community workers conducted activities such as demonstrating play with homemade toys, emphasizing the quality of the verbal interactions between mothers and children, and teaching concepts such as color, shape,size, and number [2].

E. Analysis of Knowledge Improvement and Skills of Training Participants

Increased post-training knowledge is measured through pre test and post test.Pre test is given before the training activity of improvement of child's growth knowledge, by means of each participant is given questionnaires to be filled in accordance with known basic knowledge, questionnaire consists of 30 questions are 10 questions about brain growth, 10 questions about baby's body growth and the last 10 questions about the MPASI . The average result of pre test value is 43,57 while average post test result is 76,28 so there is increase of knowledge equal to 32,71%. Increased knowledge is not as large as targeted, this is because the academic atmosphere is less supportive. Too many participants, should be divided into 2 or 3 classes to be more comfortable and concentrated, while during the demo processing of filtered foods, soft foods and peanuts cookies, the participants are very enthusiastic shown, many serious participants pay attention, record and ask the resource person.

F. Maintaining the Integrity of the Specifications

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IV. CONCLUSIONS

Based on the results and discussion can be concluded:1) Need assessment with Q short method is very practical to determine the problems of trainees, 2) Generated 3 main problem for posyandu manager that is knowledge of toddler growth, food processing of MPASI and discipline pregnant mother and toddler to come to posyandu, 3). There is an increase of knowledge and skill of the posyandu manager by 32,71% so that it can be used to answer the problem in management of posyandu. The suggestion is posyandu management is the spearhead of communitydevelopment, continuous knowledge and skill improvement is very important so that the development of pregnant and toddler problems can be handled temporarily, waiting for the handling from resource persons that is Doctor or local midwife.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

The Major Factor of Hypertension, Study Case at Posbindu Cipayung, East Jakarta

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***Abstract*— The objective study to explains the relationship between physical activity, family history, age, obesity and stress with hypertension. The research method is a quantitative study with cross-sectional study design. The population in this study are Posbindu visitors who are aged> 15 years in Cipayung District, East Jakarta. The sample taken proportionally from the number of visitors Posbindu (n=210 person). Data analysis was done by univariate, bivariate (chi square) and multivariate with multiple logistic regression. The variable influence of hypertension were a family history, age, physical activity, obesity and stress. The dominant factor of hypertension was physical activity with OR=4,5 (95% CI: 2,14-9,28). In this study there are confounding variable: consumption of salt/sodium, gender and smoking. The conclusion that people with less physical activity are at higher risk of developing hypertension than people with moderate physical activity.**

Keywords—family history, hypertension, obesity, physical activity and stres.

I. INTRODUCTION

Non Communicable Diseases (PTM) is the main cause of death globally in developed and developing countries. WHO data show that the 57 million deaths occurring in the world in 2008, 36 million or nearly two thirds were caused by Non-communicable diseases. PTM also kills the population at younger age. The proportion of causes of PTM death in people younger than 70 years old, cardiovascular disease is the biggest cause (39%) [1]. The proportion of mortality due to PTM include heart and blood vessel disease such as Hypertension and Diabetes Mellitus [2].

Hypertension is a condition the blood pressure in blood vessels increases chronically. This can happen because the heart works harder to pump blood to get of oxygen and nutrients the body. Today's hypertensive disease is a big and serious problem, because the prevalence of hypertension is high and tends to increase[2].

Based on data from Riskesdas (2013) [2], hypertension prevalence in Indonesia is 25,8% with hypertension diagnosis coverage by health manpower reach 36,8%, or in other words most of hypertension in society has not been diagnosed reach 63,2. While the case of Hypertension in DKI Jakarta Province has a high prevalence of 20.0% [2]. The PTM surveillance system in East Jakarta classifies new cases of hypertension by 2016 amounting to 52.288 cases. The highest new cases of hypertension during 2016 are located at Cipayung District Health Center 9.264 with total visit number 23.499 cases [3].

Hypertension risk factors consist of 1) Risk factors that can not be changed or modified: age, familyhistory, and gender. 2) Risk factors that can be changed or modified: smoking habit, obesity, lackof physical activity, alcohol and excess salt consumption [4].

Based on the recapitulation of integrated coaching center (Pos Pembinaan Terpadu, Posbindu) PTM results in East Jakarta Sub-Dept. Of Health in 2016, some of the most prevalent risk factors are central obesity withmeasurement of abdominal circumference (> 80 cm for women, and> 90 cm for men) with prevalence of 26.78%, followed by obesity (BMI≥25) with prevalence of 21.59%, less physical activity with prevalence 10, 64%, less eating vegetables/ fruits 10.14%, stress 3% and smoking at 1.79%. This suggests that risk factors for non-infectious diseases, especially hypertension is quite high [3].

The aim of the study was to explain the relation of age, family history, smoking, obesity, physical activity, stress, alcohol, and excessive salt intake with hypertension.

II. MATERIALS AND METHODS

This research is a quantitative study with cross sectional design. The dependent variable is hypertension. The independent variables are obesity, physical activity, stress, salt consumption, smoking, age, family history, gender.

The number of sample is 210 people from 10 Posbindu in District Cipayung. Inclusion criteria are 15 year olds, visiting Posbindu and willing to be respondents. Exclusion criteria are: in the condition of pregnant, consumption of hypertension medication, suffer stroke, heart disease. Sampling by accidental sampling.

The primary data were collected by interview for variable age, family history, smoking, physical activity, stress with Stress Reporting Questionaire (SRQ), and excessive salt consumption by Food Frequency Questionaire (FFQ). Obesity

is measured by body mass index (measuring body height and weight). Hypertension variables were measured using a digital tensimeter performed three times the measurement.

Data analysis using Chi-Square test. Then multivariate analysis by multiple logistic regression. All independent variables that become candidates are incorporated into multivariate analysis (P<0.25).

III. RESULTS AND DISCUSSION

The research was conducted in ten Posbindu Sub district of Cipayung spread in 8 villages. From the result of bivariate analysis and continued with multivariate analysis showed that from eight variables studied were found independent variable related to hypertension occurrence is obesity (IMT), less of physical activity, age ≥ 40 years, family history of hypertension and stress.

Table 1 shows that the number of respondents who suffer from hypertension is 144 (68.6%) more than the respondents who are not hypertension (normal) is 66 (31,4%). There is one independent variable homogeneous: age <40 at 13.3% (porportion<15%). Furthermore, there is a proportion of obesity (IMT ≥ 25) of 57.1%, lack of physical activity by 54.3%, stress 58.6%, excessive salt / sodium intake 73.3%, proportion of smoking 34.3%, age≥40 years of 86.7%, there is a history family hypertension of 43.3% and 36.2% for male.

TABLE I. DISTRIBUTION OF FREQUENCY OF RESPONDENTS BY BLOOD PRESSURE, OBESITY, PHYSICAL ACTIVITY, SALT CONSUMPTION, SMOKING, AGE, FAMILY HISTORY, GENDER

Variable		n (%)
Blood Pressure	Hypertension	144 (68,6)
	Not Hypertension	66 (31,4)
Obesity(BMI>25)	Obesity	120 (57,1)
	Not Obesity	90 (42,9)
Physical Activity	Less	(54,3)
	Moderate	96(45,7)
Stress	Stress	123 (58,6)
	Not Stress	87 (41,4)
Salt Consumption	Excessive	154 (73,3)
	Not excessive	56 (26,7)
Smoking	Smoke	72(34,3)
	Not Smoke	138(65,7)
Ages	≥40 Years	182(86,7)
	<40 Years	28(13,3)
Family History	There are Family History	91(43,3)
	There are not family history	119 (56,7)
Gender	Male	(36,2)
	Female	134(63,8)

Bivariate analysis using Chi Square (table 2) showed that gender did not have a significant relation with the incidence of hypertension (p>0.05). Male and female have the same risk for hypertension.

TABLE II. THE RELATIONSHIP BETWEEN OBESITY, PHYSICAL ACTIVITY, STRESS, SALT CONSUMPTION, SMOKING HABITS, AGE, FAMILY HISTORY, GENDER WITH HYPERTENSION

Variable		Hypertension	Not Hypertension	OR (95% CI)	p
Obesity(BMI>25)	Obesity	96 (66,7)	24 (36,4)	3,5 (1,91-6,44)	0,00
	Not Obesity	48 (33,3)	42 (63,6)		
Physical Activity	Less	90 (62,5)	24 (36,4)	2,92 (1,59-5,34)	0,00
	Moderate	54 (37,5)	42 (63,6)		
Stress	Stress	95 (66)	28 (42,4)	2,63 (1,45-4,78)	0,001
	Not Stress	49 (34)	38 (57,6)		
Salt Consumption	Excessive	114 (79,2)	40 (60,6)	2,47 (1,31-4,47)	0,005
	Not excessive	30 (20,8)	26 (39,4)		
Smoking	Smoke	57 (39,6)	15 (22,7)	2,23 (1,42-4,33)	0,017
	Not Smoke	87 (60,4)	51 (77,3)		
Ages	≥40 Years	131 (91)	51 (77,3)	2,96 (1,32-6,66)	0,007
	<40 Years	13 (9)	15 (22,7)		
Family History	There are Family History	74 (51,4)	17 (25,8)	3,41 (1,61-5,79)	0,001
	There are not family history	70 (48,6)	49 (74,2)		
Gender	Male	56 (38,9)	20 (30,3)	1,46 (0,79-2,73)	0,229
	Female	88 (61,1)	46 (69,7)		

Obese respondents (BMI> 25) had a risk of 3.5 times more hypertension than non-obese. Less of physical activity is at risk 3 times affected by hypertension compared with moderate physical activity. Stress risks triggering hypertension 2.6 times compared with no stress. Consumption of excess salt risk 2.5 times trigger hypertension. Smoking risks 2.2 times more hypertension than non-smokers. People aged over 40 years are at risk 3 times affected by hypertension. Respondents who had a family history of hypertension would have 3.4 times greater risk of hypertension than those without family history of hypertension (Table 2).

TABLE III. BIVARIAT SELECTION

Variable	P Value	Information
Obesity	0,000	Candidate
Physical Activity	0,000	
Stress	0,001	
Salt Consumption	0,005	
Smoking	0,007	
Ages	0,017	
Family History	0,001	
Gender	0,229	

TABLE IV. MULTIVARIATE ANALYSIS (FIRST MODELS) THE RELATES FACTORS WITH HYPERTENSION

Variable	P Value	Exp (B)	95% CI FOR EXP (B)	
			Lower	Upper
Obesity	0,004	2,936	1,419	6,072
Physical Activity	0,001	3,506	1,620	7,588
Stress	0,017	2,400	1,166	4,939
Salt Consumption	0,142	1,809	0,820	3,993
Smoking	0,009	3,846	1,470	10,517
Ages	0,061	2,773	0,956	8,044
Family History	0,001	3,784	1,772	8,080
Gender	0,120	0,453	0,167	1,230

TABLE V. LAST MODELS

Variable	P Value	Exp (B)	95% CI FOR EXP (B)	
			Lower	Upper
Obesity	0,004	2,870	1,399	5,889
Physical Activity	0,000	4,456	2,140	9,281
Ages	0,016	3,192	1,239	8,227
Family History	0,001	3,681	1,744	7,771
Stress	0,037	2,108	1,046	4,247

Based on the results of multivariate analysis with multiple logistic regression, the variables significantly related with hypertension were obesity, physical activity, age, family history and stress (Table 5). Variables that have a cause relationwith hypertension in Posbindu District Cipayung are as follows:1) Obesity people risk 2.9 times (95% OR OR 1,399-5,889) suffer from hypertension compared to people who are not obese. 2) People with less physical activity were at risk 4.5 times (95% CI OR 2,140-9,281) suffered from hypertension compared to people with moderate physical activity. 3) People aged ≥ 40 years are at risk 3.2 times (95% OR 1,239- 8,227) have hypertension compared with people <40 years old. 4) People with family history of hypertension is the greater risk of 3.7 times (95% CI 1,744 - 7,771) have hypertension compared with people who do not have a family history of hypetension. 5) People who are more at risk of stress 2.1 times (95% CI OR 1, 046 - 4,247). 6) The counfonding variables are 1) Excessive salt / sodium consumption to obesity variable 2) gender to stress, age, and family history, and 3) Smoking habit to physical activity, stress, and age.

Obesity is related with hypertension [5, 6, 7, 8].Obesity will trigger the occurrence of hypertension because if a person's body weight increases then the volume of blood also increases so the burden of the heart to pump blood also increases [9]. Fat accumulation due to obesity raises plaque that will clog the blood flow so that blood pressure increases [4, 10].

Less physical activity can risk of high blood pressure [11, 12]. This can increase the risk of becoming obese. People with less physical activity tend to have a faster heart beat and heart muscle should work harder on every contraction and often. The heart must pump bigger and urgent arteries so that blood pressure will increase.

Increased age may increase the risk of hypertension [7, 13, 14].The addition of age is caused by the thick of the arterial wall by accumulation of connective tissue. At that time it's also decrease in elasticity and densibilitas vessels, so that the aorta becomes stiff. A rigid aorta causes blood-constricted areas during cardiac constriction to be limited, resulting in increased systolic blood pressure without the increase in diastolic blood pressure [15].

People who have hypertension offspring are congenital to suffer from hypertension, the more likely adults are suffering from greater hypertension [7, 16, 17].When viewed from the side plausibility (+) in theory a person suffering from hypertension, has a genetic factor of his family and at risk of suffering from hypertension. This is related to elevated intracellular sodium levels and low ratio between potassium to sodium Individuals with elderly people with hypertension [4].. If both parents suffer from hypertension, then about 45% down to his children.

Stress associated of hypertension [6, 18, 19, 20]. This is due to hypertension related to sympathetic nervous activity, in conditions stress will increase and affect the blood flow, thus causing the heart to pump blood faster, and it can lead to increased blood pressure [18]. According to the Framingham study, women aged 45-64 years have a number of stress-triggering factors such as tense circumstances, domestic problems, economic stress, daily stress, job mobility, anxiety and buried anger. All of these are associated with increased blood pressure and clinical manifestations of cardiovascular disease. In addition, emotional pressure and activation of the nerve causing increased blood pressure due to vascular arteriolar vascular arterioles post glomerulus resulting in sodium retention with the consequent increase in plasma volume and extra fluid volume of cells affecting the occurrence of hypertension [21]. Individuals living in urban areas with higher levels of stress have a higher risk of hypertension than individuals living in rural areas [19].

IV. CONCLUSION

The proportion of hypertensive patients who visited Posbindu in Cipayung Puskesmas area in June 2017 was 68,6%. Variables that have a causal relationwith hypertension in Posbindu District Cipayungis as follows: obese, less physical activity, age≥ 40 years, have a family history of hypertension, stress. Counfonding variables are excessive salt / sodium consumption, gender, and smoking.

It is suggested that health officers from Cipayung Community Health Center conduct socialization of CERDIK behavior (Regular health check including blood pressure check, Awareness of cigarette smoke, Diligent physical activity, healthy and balanced diet, adequate rest and manage stress) for the community.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

Maternity Plus Class Model in Improving Efforts of Planning of Labor and Preventing of Pregnancy Complications at Risk in Rural Communities

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***Abstract*—The development of "Maternity Plus Class" become a model of innovation in revitalizing the role of maternity class programs for family education in planning of labor and preventing of pregnancy at risk complications (P4K). This research was conducted in 4 villages in Singorojo Kendal sub-district. The design of this research is quasi experiment with non-equivalent control group design with pretest and posttest. Data analysis using mix method. The results showed that there was significant differences between P4K efforts before the implementation of maternity class model. While in the control group did not show any significant difference.**

Keywords—maternity class, pregnancy, childbirth, complications

I. INTRODUCTION

Deaths during pregnancy until 42 days postpartum is still a national problem. The MDG targets in reducing maternal mortality to 102/100,000 live births have not been achieved. Romero et al (2007), stated that developing countries have accounted for 99% of total maternal deaths.

Kendal district is one of the areas that experienced problems of maternal mortality to date. In the last 3 years, there has been a significant increase in cases. In 2015 there were 23 cases, in 2016 occurred 19 cases, and increased significantly in 2017 that were 25 cases. This fact put Kendal as the eighth largest number of Maternal Mortality Rate in Central Java. Causes of maternal death cases are bleeding, hypertension and anemia (Hb <10g/dl).

Research by Aeni mentioned the factors that affecting maternal mortality are pregnancy complication, labor complication, and history of maternal disease [1, 2]. The history of the disease affect to the maternal death. The history of maternal disease can increase the maternal mortality.

These factors become risk factors for pregnancy. Pregnant women with those conditions categorized as pregnancy at high risk. Increased in maternal mortality was the impact of high number of pregnancy at high risk.

One of the areas in Kendal district which until now in pregnancy prone category is Public Health Center (Puskesmas) of Singorojo area. In the last 3 years, pregnancy at high risk cases in Public Health Center (Puskesmas) of Singorojo have increased. In 2015, it estimated 34.48% of cases of pregnancy at high risk, in 2016 increased to 56.30%, and in 2017 reached to 55.28% (Public Health Center (Puskesmas) Singorojo, 2018).

These facts showed that more than half of the pregnancy occurs in these areas is pregnancies at high risk. This condition will have serious impact on the pregnant women such as abortion, bleeding, pregnancy poisoning, convulsions, reduced fetus movement, premature labor, developmental and growth disorders of pregnancy, early rupture of amnion membranes and complications during labor, even the most severe impact which is maternal death.

The geographical condition of the Singorojo sub-district which far from the refferal health care center of pregnancy with complications is the cause of the increase in maternal mortality, especially during labor. People in the Singorojo subdistrict must travel 33 kilometers to refer the pregnancy at risk and complicated labor cases (complications with obstetrics) to the hospital. This fact has an impact on the delay in reaching the birthplace, and the delay in obtaining emergency assistance experienced by pregnant women at high risk.

There are still pregnant women in the "4 too" category that are too old during labor, too young, too many children and also too close in range from previous pregnancy in Singorojo area is also the cause of pregnancy at high risk. Within the last year, in the area of Public Health Center (Puskesmas) of Singorojo are still found 92 cases of early labor (under the age of 18 years). This condition is very risky for the occurrence of labor complications and is not a few which cause maternal mortality, because at that age, anatomically and physiologically, the reproductive organs of the maternal are not perfectly prepared for pregnancy or labor.

Labor planning in pregnant women at high risk is very necessary to be done as an effort to prevent complications and emergency labor. Labor planning is an activity that should be done by pregnant women and their families to plan for safe labor and all forms of preparation for labor. A pregnancy complication is an obstetric emergency that can cause death in both mother and baby. The inhibiting factors must be identified and minimized in order to resolve the problem. Otherwise, the factors that support, strengthen and all potential must be a power in solving the problem.

Previous study by researchers, is known that 72% of pregnant women did not know the exact steps in planning a safe labor. In addition, they also have not made any preparations for the labor. Pregnancy and labor are still regarded as natural processes experienced by a woman.

Education about planning of labor and preventing of pregnancy complications at risk is essential to be implemented in rural communities. All this time, education only done by midwives when providing Antenatal Care services. Community empowerment, especially pregnant women and their families is very important to be intensified, one of its strategy is to develop "Maternity Plus Class". This model is not only involves pregnant women, but also involves the husband and their family to become participants of the maternity class. In addition, this model uses the innovations of methods and media that are more attractive to the pregnant women and husband or their families.

Maternity class is a media of learning together directly face to face in the group about health for pregnant women. Expected goals after the pregnant women followed the maternity class are to improve knowledge, change attitudes and behavior of pregnant women to understand about pregnancy, pregnancy care, labor, postnatal care, family planning, newborn care, myths, infectious diseases and childbirth certificates.

This study aims to analyze the effect of the application of "Maternity Plus Class" model to the improvement of knowledge, attitude and effort of planning of labor and preventing of pregnancy complications at risk in rural area.

II. MATERIALS AND METHODS

A. Research Design and Research Subjects

The research design used was quasi experiment with non-equivalent control group design with pretest and posttest. In this design, there were two subject groups where one gets treated and one group as a control group. Both groups were given pre test and post test.

Research subjects in both groups were firstly given pretest. After that, each group run the program for 3 months (in cohort), then conducted a final test (post test) to find out how much influence the application of model "Maternity Plus Class" to the increased of knowledge, attitude and effort of planning of labor and prevention of complications pregnancy at risk in pregnant women in rural area.

The population of this study were pregnant women in 4 villages located in the Singorojo subdistrict in Kendal which had the highest number of pregnancy at high risk cases. Samples were determined purposively with the following conditions: the gestational age of the study subjects at the start of the study was 4 to 12 weeks (Trimester I), domiciled in the study area, and could read and write. Based on these conditions obtained the sample of 133 pregnant women. The sample is then divided into 2 groups namely the experimental group and the control group.

B. Instruments and Data Collection Techniques

The instrument used in this study was a questionnaire to collect data on knowledge, attitudes of pregnant women and their families and observation sheets, and documentation studies related to crosscheck of the effort of childbirth planning and prevention pregnancy at risk complications conducted by pregnant women in rural communities.

C. Ethical Considerations

This research has fulfilled the ethical feasibility by Health Research Ethics Committee of Universitas Negeri Semarang.

D. Data Analysis

The research data were analyzed to determine the effect of the application of the "Maternity Plus Class" model to the increased of knowledge, attitudes and efforts of planning of labor and prevention of pregnancy at risk complications for pregnant women in rural areas by Mc Nemar test or alternately.

III. RESULTS AND DISCUSSION

The Table (1) shows that the determinants of pregnancy at risk include: age factor, number of parity, range to previous pregnancy, history of miscarriage, history of caesar surgery and history of ecslampsia / pre ecslampsia. The study data showed 44.44% were pregnant at less than 20 years old and over 35 years old, 25% of mothers had a history of pregnancy of more than 4 times, 8.33% had a gestational range less than 2 years from the previous pregnancy, 5.92% had miscarriage and 16% of pregnant women had caesar surgery.

The Table (2) shows that after the implementation of the Model of Maternity Plus Class for three months, there was significant increase in knowledge related to pregnancy at risk, and planning of labor and prevention of complications (P4K) program. Before joined the Maternity Plus Class program, 46 pregnant women (66.67%) still had poor knowledge about pregnancies at high risk and did not know the planning of labor and prevention of complications (P4K) program completely. There were still many who do not know the risk factors for pregnancy at high risk that can be seen from too young or old pregnancies, previous pregnancy history such as miscarriage,

caesarean birth, breech fetal location, the range of pregnancy is too close, and the history of disease suffered.

This fact changed significantly after joining the Maternity Plus Class program, the number of pregnant women whose knowledge is still in the less category reduced to 19 people (27.53%). This shows that there was significant increase of knowledge between before and after the program of Maternity Plus Class (p value 0,00001).

TABLE I. CHARACTERISTICS OF RESEARCH SAMPLES AND DETERMINANT OF PREGNANCY AT RISK

Characteristic	f	%
Age		
< 20 years	18	13,33
20-35 years	75	55,56
> 35 years	42	31,11
Educational Level		
Ungraduate from primary school	3	2,22
Primary School/ equivalent	9	6,67
Middle School/ equivalent	81	59,68
High School/ equivalent	34	25,18
Higher Education	8	6,25
Occupational Status		
Working	65	48,00
Not working (Housewife)	70	52,00
Height		
≤ 145 cm	0	0,00
> 145 cm	135	100,00
Amount of Parity		
< 4 times	101	75,0
≥ 4 times	34	25,0
Range with Previous Pregnancy		
< 2 years	11	8,33
≥ 2 years	124	91,67
Miscarriage		
Ever	8	5,92
Never	127	94,08
Caesar Surgery		
Ever	22	16,00
Never	113	84,00
History Eclampsia / Pre ecslampsia		
Ever	0	0,00
Never	135	100,00

The model of Maternity Plus Class was also significantly able to change pregnant women's attitudes toward planning of labor and prevention of complications (P4K) program. It was indicated by p value 0,00001). Before joined the Maternity Plus Class program, 37 pregnant women (53.62%) still had an unfavorable attitude related to P4K efforts. They still thought that pregnancy is a natural process faced by every woman of childbearing age, so there is no need for intensive efforts in the planning of labor and prevention of complications (P4K).

In addition, this model also has significantly improved P4K efforts. This is indicated before the program of Maternity Plus Class, 33 pregnant women have not implemented the P4K program completely. This is indicated by the evidence of many pregnant women who do not know their blood type, not prepare and raise health funds.

TABLE II. INFLUENCE OF IMPLEMENTATION OF MATERNITY PLUS CLASS MODEL ON INCREASING KNOWLEDGE, ATTITUDES AND EFFORTS OF PLANNING OF LABOR AND PREVENTION OF PREGNANCY AT RISK COMPLICATIONS

		Knowledge of Pregnancy at Risk and P4K **(After)**			*p value*
		Not good	Good	Total	
Intervention Group					
Knowledge of Pregnancy at Risk and P4K **(Before)**	Not good	18	28	46	0,00001
	Good	1	22	23	
	Total	19	50	69	
Control Group					
Knowledge of Pregnancy at Risk and P4K **(Before)**	Not good	28	4	32	0,687
	Good	2	30	32	
	Total	30	34	64	
		Attitudes towards P4K **(After)**			*p value*
		Not good	Good	Total	
Intervention Group					
Attitudes towards P4K **(Before)**	Not good	16	21	37	0,00009
	Good	0	32	32	
	Total	16	53	69	
Control Group					
Attitudes towards P4K **(Before)**	Not good	21	1	22	0,219
	Good	5	37	42	
	Total	26	38	64	
		P4K Efforts that Have been Done **(After)**			*p value*
		Not good	Good	Total	
Intervention Group					
P4K Efforts that Have been Done **(Before)**	Not good	22	11	33	0,001
	Good	0	36	36	
	Total	22	47	69	
Control Group					
P4K Efforts that Have been Done **(Before)**	Not good	21	3	24	0,727
	Good	5	35	40	
	Total	26	38	64	

Other facts occurred in the control group, the group in which the Maternity Plus Class is run by the current mechanism applied in those areas, the knowledge, attitudes and efforts of P4K have not shown any significant change or improvement.

After joining the maternity class, pregnant women and their families could make behavioral changes and more aware of the importance of pregnancy examination to health services. So that the output achieved in the form of ANC visit, and pregnant women will later apply Program of planning of labor and prevention of complications (P4K) well. Research by Azeem, stated that there is a significant increase in knowledge on pregnant women who take the maternity class intensively [3].

Azwar's other research, attitude formation can occur because of education / training beside the personal experience, influence, culture, mass media, and emotional person [4]. Furthermore, maternal knowledge is very important to always be improved through the maternity class model to reduce risk factors for maternal death and perinatal death. Maternal knowledge is also associated with perinatal mortality (Ummul Mahmudah, et al, 2011).

Maternity class affect maternal knowledge and attitude (Elsa Budi Sihsilya R, et al, 2016). Maternity class can change the attitude of the community in the selection of labor assisted by medical personnel. The change of attitude in the selection of labor is encouraged by the better knowledge and motivation also the role of the good health personnes (Rochayah, 2012).

Models of Maternity Plus Class could also improve the ability of pregnant women and their husbands or families in the identification of pregnancies at risk and practices in risk prevention and possible pregnancy complications. This proved that the other outputs that are the strength of the Maternity Class program are the maternity class implemented: 1) the knowledge of maternity class participants is increased, 2) the better attitudes of pregnant women, 3) the better practice of risk prevention and maternal complications pregnancy, 4) Maternity class participants become more intensive to visit Antenatal Care (Fibriana and Azinar, 2016).

IV. CONCLUSIONS

The results showed there were significant differences between effort planning of labor and prevention of complications in experiment group (p value 0,00002). Maternal knowledge and attitudes toward pregnancy at risk influenced antenatal care practice (p value 0,006). The level of pregnancy at risk affected behavior in planning of labor and prevention of complications (p value 0,00001). While in the control group did not show any significant difference.

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The Influence of Asmaul Husna Dhikr to Psychological Wellbeing of Employees

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***Abstract*—The form of violence change based on age, workplace bullying is a serious problem that happen until now days, it includes physical bullying, verbal bullying, psychological bullying, and social bullying. Workplace bullying behaviors are pervasive in some healthcare organizations leading to difficult work environment. Then dhikr becomes one of the solutions of spiritual activity with the various problems that exist. This study is aimed at finding the influence of Asmaul Husna dhikr towards Psychological Wellbeing of the employees.This study involved 43 employees of the afternoon shift in Production division in PT Kharisma Export Yogyakarta as research subjects and intervention of Asmaul Husna dhikr. This study used quantitative research design and Psychological Wellbeing Scale as research instrument. The pretest and posttest data were then analyzed through the Wilcoxon test using SPSS 16. Based on t Test, it showed that significance value was 0.001, because value 0.001 was smaller than 0.05, it could be concluded that "Ha was accepted" which meant that there was difference of psychological wellbeing of employees before and after Asmaul Husna dhikr. Thus, it could be concluded that "there was influence of Asmaul Husna dhikr on psychological wellbeing of employees."**

Keywords—Asmaul Husna, dhikr, psychological wellbeing, employees

I. INTRODUCTION

Work is a fundamental aspect of life [10]. During last 25 years technological development has accelerated the globalization process which has caused dramatic changes within and cross organization. Business performance is varying, complex, global and is changing faster than ever before [12].

Work when organized and managed in certain ways, can produce various positive individual and societal benefits [10]. Wellbeing in the workplace has increasingly become a common topic in mainstream organizational research [22]. Kaplan et.al [10] show that employee wellbeing has a broader impact such as on the school performance of children of working parents.

In fact, the form of violence change based on age, workplace bullying is a serious problem that happen until nowadays, it includes physical bullying, verbal bullying, psychological bullying, and social bullying [9].

Workplace bullying behaviors are pervasive in some healthcare organizations leading to a difficult work environment [4].

Hidayati and Rahayuningsih [9] add that bullying is an aggressive behavior that happened on purpose to make physical discomfort or psychological discomfort to other, the position of worker that usually inferior has made factory workers become a potential object of workplace bullying.

The employees' turnover is basically influenced by many factors, including bullying at workplace and interpersonal conflict [18]. He adds that workplace bullying can be in the form of hiding information related to the jobs, the lack of freedom in telling employees' argument, the and the spread of gossip among the employees in the organization. It then creates interpersonal conflict which leads to employees' turnover. From his study, it showed that workplace bullying has a positive influence to the employees' turnover, and interpersonal conflict has a positive influence to employees' turnover [18].

It is realized that the unfriendly working climate creates someone to be bored and feeling worried. When it happens, many of them will look for spiritual activity as the solution, for instance, by performing *dhikr*. By all problems existed, *dhikr* presents as one way to accommodate the pressure mentioned above, therefore, one will get the balance between his or her thought and the real world. In addition, *dhikr* is also one of the mechanisms that can new energy (librari.walisongo.ac.id/digilib, 2017).

Then the new energy will eventually bring the individual to a psychological wellbeing, in which the individual is able to accept himself as the way he is, create a friendly relationship with others, possess independence in encountering social pressure, control external environment and possess goals in his life, and realize his potential over and over [6].

Psychological wellbeing is an individual's ability to optimize his psychological function featured by accepting his condition, developing his individual growth, building a positive relationship with others, having self-independence, having life goals, and controlling environment [14].

According to Ryff [6] Psychological wellbeing is an individual's ability to accept his own condition as what he is (*self-acceptance*),create relation with others (*positive relation with others*), have autonomy in encountering social pressure (*autonomy*), control external environment (*environmental mastery*), have life goals (*purpose in life*), and be able to realize his potential continually (*personal growth*).

Psychological wellbeing is defined as a positive evaluation about someone's life associated by obtaining a pleasure feeling [17].

In the other hands, Hauser, Springer, and Pudrovska [8] explain that psychological wellbeing is also defined as an individual's psychological wellbeing focusing on self-realization, personal expressiveness, and self-actualization.

Ryff & Keyes [23] state that there is a difference of psychological wellbeing level based on age. The different age consists of three stages of adult development including younger, middle-aged adult, and later adulthood. The individuals in middle-aged adult can show higher psychological wellbeing than those in the younger and later adulthood stage related to some dimension of psychological wellbeing [16].

Based on the employees 'problems existed at the workplace mentioned previously, it is important to follow up in study field to reveal about the influence of *Asmaul Husna dhikr* to psychological wellbeing of the employees. However, the important roles of psychological wellbeing of individual's life at the workplace will influence his performance.

II. MATERIALS AND METHOD

A. Objective Of Study

This study is aimed at knowing the influence of *Asmaul Husna dhikr* towards psychological wellbeing of the employees and to provide alternative solutions in how making psychological wellbeing to the employees in a very basic way through *Asmaul Husna dhikr*.

In addition, it is expected that this study is able to provide contribution to the growth of psychological knowledge particularly in Occupational and Health Psychology.

B. Research Time And Setting

This study was conducted in PT Kharisma Export Yogyakarta. The research process was done in 14th June 2017 to 8th July 2017, started by getting research license from the director of PT Kharisma Export Yogyakarta which is located in Jalan Paris KM 3 Bantul Special District of Yogyakarta. Then in 15th June 2017, the direction told the researcher about the certain time to conduct the research from 16th June 2017 to 8th July 2017. There were 43 employees of Production division that were getting permission as research subjects.

C. Data Collecting Method

Data collecting method is the researcher's method in obtaining data that are researched. It is purposed to reveal the fact about the variables researched [2].

The quality of the data is based on the quality of the instrument or the measurement. Thus, before the instrument was used, it was conducted try out of Psychological Wellbeing Scale through Google form.

The researcher then conducted validity and reliability test of the instrument. The validity test was conducted to know how far the scales use able to produce the accurate data in line with the purpose of measurement [3]. The instrument of measurement is called high valid when it runs as the function of measurement or provide the result of measurement which is appropriate with the purpose of conducting measurement [3].

The Psychological Wellbeing refers to the type of content validity and internal validity. Content validity is to show how far the items in the test include the overall scope of subject measured [3]. Content validity is to measure instrument by using rational analysis or by professional judgment that is how far the items included in the instrument appropriate with the attitude measured [3]. Meanwhile, internal validity is by using comparison criteria obtained from the instrument; by correlating the value of each item with total score [2].

The researcher then conducted reliability test which means as the constancy of measuring instrument to measure the same which means that when there are several times in measuring the same subject group, the results of those measurements are relatively the same; as long as the aspect of the subject measured has no change then the measurement can be reliable [3].

The high or low of measuring instrument is stated by the number called reliability coefficient. The value of reliability coefficient is in the range of 0.00 to 1.00 which means that the higher the reliability coefficient is obtained, the better reliability coefficient showed. Therefore, the reliability coefficient that is close to 1.00 means that there is a consistency of perfect measurement [3].

In this research, the reliability coefficient of Psychological wellbeing scales used Alpha Cronbach correlation in SPSS 16.0 for Windows.

Reliability test for Psychological wellbeing scale used item validity by the help of SPSS 16.0 for Windows by correlating each value of each item with total score. Based on the test, it was obtained 37 items from 45 items as valid.

The next research procedure was collecting data started by taking administration procedure that is asking for getting research license to PT Kharisma Export Yogyakarta. The researcher conducted observation and interview with production division.

Before performing an intervention, the employees were asked to fill Psychological Wellbeing scale assisted by the researcher. Then, it was performed intervention as *Asmaul Husna dhikr* led by spiritual company (ustadz).

Asmaul Husna dhikr is defined as the best names of Allah SWT [20].

At the time of intervention, each employee was given guide book of *Asmaul Husna dhikr* written by KH. Amdjad al Hafidz. The dhikr was performed together led by ustadz. After getting intervention for two weeks, the employees were asked to fill psychological wellbeing scale once more to be measured the wellbeing level after performing *Asmaul Husna dhikr*.

D. Data Analyzing Method

The research subjects were the employees of PT Kharisma Export Yogyakarta, and most of them were living in Bantul area with the age range was between 22 to 47 years old.

On 16th June 2017 at 06.30 pm, the employees of Production division in the afternoon shift were firstly given

briefing related to the research conducted. They were asked to fill Psychological Well Being scale as pretest before performing *Asmaul Husna dhikr*.

On the next day, on 17th June 2017 to 8th July 2017, at 06.30 pm it was done *Asmaul Husna dhikr* headed by Spiritual Company (*Ustadz*) routinely for 30 minutes (until 07.00pm).

On 8th July 2017, the employees of Production division in afternoon shift were asked to fill Psychological Well Being for the second time as posttest.

Based on the result of pretest and posttest, the normality test showed that the distribution was not normal. Therefore, the researcher process the final data by using non-parametric statistical test Wilcoxon Signed-Rank Test, when the samples are dependent, as they would be in a before-and-after test using the same subject, the Wilcoxon signed-rank test can be used in place of the t test for dependent samples. Again, test does not require the condition of normality [5] by using SPSS 16.0 program for Windows.

III. RESULT AND DISCUSSION

The research conducted was purposed to obtain the real data. The data were then analyzed statistically to test research hypothesis. The first procedure, it was conducted normality test for pretest data. Since the data was not in normal distribution, the researcher then used Wilcoxon test to find out the difference before and after *Asmaul Husna dhikr* intervention. The result of Wilcoxon test can be seen in the following table.

TABLE 1: RESULT OF *PRETEST* AND*POSTTEST* OF THE EMPLOYEES BY USING WILCOXON TEST

Score Data	N	Means	Sum
Pretest (in positive score)	16	9.22	147.50
Posttest (in negative score)	1	5.50	5.50
Similarity of *Pretest* and *Posttest*	26		
Sum	43		

Based on the table of statistics result through Wilcoxon test by using SPSS 16, the Negative Ranks between the result of pretest and posttest of the employees' psychological wellbeing before and after *Asmaul Husna dhikr* was 1 in the N value 5.50 for Mean Ranks and Sum Ranks. The value 1 showed that there was improvement from the score of Pretest to Posttest.

Positive Ranks between the result of pretest and posttest of the employees' psychological wellbeing scale after *Asmaul Husna dhikr* showed 16 positive data (N) from 43. It meant that there were 16 employees who got improvement of psychological wellbeing from the result of pretest to posttest. Mean Ranks was 9.22, while positive ranks or Sum Ranks was 147.50.

In addition, Ties was the similarity of the score of Pretest and Posttest. The Ties was 26 which could be concluded that there were the similar scores between those in Pretest and Posttest as many as 26 employees.

It was then conducted t test from the data of pretest and posttest. The result of t test can be seen in the following table.

TABLE 2. RESULT OF T TEST

T test	Pre test Post test
Z Value	-3.443[a]
Significance Value	0.001

Based on the statistical test output above, it was known Asymp.Sig. (2-tailed) was 0,001. Because the value 0,001 was smaller than 0, 05, it could be concluded that "Ha was accepted". It meant that there was difference before and after performing Asmaul Husna dhikr.

The similar research about wellbeing was done by Maulidina and Nurtjahjanti [14] who found that there was significant negative relationship between discomforts at workplace toward psychological wellbeing of the outsourcing employees in Sultan Agung Hospital, Semarang.

Khasanah [11] conducted experimental research with Asmaul Husna dhikr intervention to children in orphanage Darussalam, Mrenggan, Demak. She found that there was difference of anxiety level in the National Exam before and after getting Asmaul Husna dhikr intervention.

In addition, Latief and Ratnaningsih [13] stated their research finding that there was a positive relationship between Leader Member Exchange and psychological wellbeing of inpatient ward nurses in RSUD Cideres Majalengka.

Still about employees' wellbeing, Simarmata [21] explained two findings. First,result of correlation analysis showed that there was a positive relationship between job satisfaction and employee wellbeing. Second, the job satisfaction and wellbeing of the employees were average.

Aruan and Fakhri [1] found in their research that the physical work environment and the non-physical work environment had the most positive and significant influence to the employees satisfaction.

Nugraheni [15] showed that in her research finding, there is a significant positive relationship between psychological wellbeing and social support on an honorary teacher area.

Sari [19] showed that there is a significant negative relationship between psychological wellbeing with a dual role conflict.

Wardani and Sawitri [25] found that there was a positive and significant relationship between career calling and psychological wellbeing of the staff in the jail.

Tanujaya [24] found that there was rather lower positive relationship between working satisfaction and psychological wellbeing.

According to Edward and Richard [7] they stated that Self Determination theory (SDT) has been applied in varied culture and in many domains, and research is reviewed that has related autonomous and controlled motivation to education, parenting, work, health care, sport, and close relationship.

One limitation of this study was a small sample size. Although researcher achieved adequate power for the quantitative analyses, the findings are not representative of how all employees would feel and get wellbeing by *dhikr* intervention. The limitation time of intervention also had impact in the result of this research. In this study, researcher also depended on self-reports of the subjects of study, potentially creating response bias.

IV. CONCLUSION

There is no employee who does not have problem at workplace. By all problems existed, it demands an employee to find the best solution, one of them is by performing a positive spiritual activity that is Asmaul Husna *dhikr*. Dhikr presents as one way to accommodate the pressure mentioned above, therefore one will get the balance between the thought and the real world. In addition, *dhikr* is also one of the mechanisms that can add new energy. Then, the new energy will eventually bring the individual to a psychological wellbeing level. It then leads an individual to have self-acceptance, autonomy in encountering social pressure, external environment mastery, purpose in life and be able to realize his own potential continually.

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***Abstract*— Description in this research is the use of Muscle strength, Explosive power, Cardio endurance, Flexibility and Coordination as a measure of athlete biomotor ability at male athletes. Measurement their Biomotor ability held at the Faculty of Sport Science of Jakarta State University. The research findings the Biomotor Ability Profile of Indonesian Male Rugby Athletes for Asian Games 2018 are; Good muscle strength 9 (50%), Average muscle strength 7 (38.8%), Less muscle strength 2 (11.2%); Good explosive power 16 (89%), Average explosive power 1 (5.5%), Less explosive power 1 (5.5%); Good cardio endurance 0 (0%), Average cardio endurance 0 (0%), Less cardio endurance 18 (100%); Good flexibility 1 (5.5%), Average flexibility 14 (77.8%), Less flexibility 3 (16.7%); and Good coordination 9 (50%), Average coordination 5 (27.7%), Less coordination 4 (22.3%). The conclusion of this study are; Muscle strength, explosive power, flexibility and coordination at Indonesian Male Rugby Athletes for Asian Games 2018 are good meanwhile their cardio endurance are less.**

Keywords*— *Biomotor ability; muscle strength, explosive power, cardio endurance, flexibility, coordination and rugby athletes

I. INTRODUCTION

Most sport activities can be classified as having a pre dominant biomotor ability. Every sport activity has dominant biomotor ability. However, contemporary research suggests that sport activities can be affected by several biomotor abilities. It can be clearly seen by the fact that muscular strength appears to influence both running speed and endurance at rugby athlete. Leg strength and power appear to be significantly related to sprint speed, with the strongest and most powerful at rugby athletes being able to run fastly. In fact, rugby athlete performance is dominated by combinations of strength, speed, endurance, flexibility and balancing. The objective of this research is to obtain information the Biomotor Ability Profile of Indonesian Male Rugby Athletes for Asian Games 2018.

II. MATERIAL AND METHOD

A. Biomotor Ability

Biomotor ability are critical factors in deter¬mining success in a wide variety of sports. For example, muscular strength and power are generally acknowledged as being important in all team sports and sports that are dominated by speed, not exception rugby team sport. Bompa coined 8 biomotor abilities. (Speed, Strength, Endurance, Coordination, Balance, Power, Flexibility and Agility). 8 biomotor ability would be the GOLD Standard for that ability. This means the best human being we have seen at this ability

Muscle Strength. Strength can be defined as the maximal force or torque (rotational force) a muscle or muscle group can generate. Strength is better defined as the ability of the neuromuscular system to produce force against an external resistance. Contemporary literature suggests that high levels of muscular strength are significantly related to sport performance. For example, muscular strength has been related to sprint performance at rugby playing. Therefore, the appropriate application of resistance training can alter the neuromuscular system in a way that improves the athlete's capacity to produce force and improves sports performance.

The maximal strength that an athlete can exhibit depends on seven key concepts: (a) the number of motor units involved (recruitment), (b) the motor unit firing rate (rate coding), (c) the amount of motor unit synchronization, (d) the use of the stretch shortening cycle, (e) the degree of neuromuscular inhibition, (f) the muscle fiber type, and (g) the degree of muscle hypertrophy.

The terms strength is widely used to describe some important abilities that contribute to maximal human efforts in sport and other physical activities. Unfortunately, there is often little consistency in the way the terms are used. Though it is widely accepted that strength is the ability to exert force, there is considerable disagreement as to how strength should be measured. The weight that a person can lift is probably the oldest quantitative measure of strength. Technological developments have popularized the use of isometric strength testing and, more recently, isokinetic strength testing.The coach and athlete must understand how the development of strength can affect performance. The coach and athlete need to understand the principles associated with resistance training to effectively use resistance training to enhance performance. Measurement muscle strength used grip, pull/push, leg and back.

Explosive Power is precisely defined as the rate of doing work, where work is the product of the force exerted on an object and the distance the object moves in the direction in which the force is exerted. Quantitatively, work and power are defined as:

- Work = Force x Distance

- Power = Work/Time

Power can also be defined as

- Power = Force x Velocity

So power is the product of the force exerted on an object and the velocity of the object in the direction in which the force is exerted. Or simply put, power describes force with respect to time. Biomotor abilities strength and speed combine to create power. An athletes can be strong and able to move a heavy load but not necessarily powerful where an athletes would move the load rapidly. Movements such as vertical jumps, standing broad jumps, different types of tossing, passing or throwing with medicine balls (measuring the distance thrown or jumped) can all be used to test power

The rate of force development is at the maximum for any type of muscle action is explosive power. In activities requiring high acceleration and output, explosive power training is necessary for maximum development. Some examples of these activities would include soccer, hurdling and football. This type of training is effective in enhancing athletic performance.

The general exerciser doesn't usually need to include explosive power training in a regular workout. Cardiovascular and strength training in a slow, steady manner will give adequate results. In contrast, Athletic movements need to be performed at high speeds. The muscles have to be developed and trained outside of the sport in order to do this. The types of exercises used in explosive power training are determined by the type of sport that is being trained for. For example, for a rugby player trying to improve his jump shot would have a training program that would include weighted vertical jumps.

Explosive power exercises should be taught and supervised by fitness professionals to reduce the risk of injury. They should also be done in conjunction with a regular workout program to ensure that the athlete is balanced in all exercise areas

To develop explosive power need to do two things. First, build speed and strength. An athletes must raise absolute strength. A shot putter must become stronger and at the same time, faster. The majority of this training is combining max effort exercises to increase the strength potential of the muscles, while training with light weights will lead to improving speed.

To improve explosive power, the movement must change from eccentric to a concentric action. One popular method is the Plyometrics method. For this, depth jumps are in order. This calls for the athlete to fall from a distance and upon landing, immediately jump upward in under 0.2 seconds. This is reversible muscular action or the stretch-shortening cycle. It is used in most sports skills due to muscle and tendon elasticity. The athlete must use the correct movement velocities.

Cardio Endurance can be classified several ways. For example, aerobic endurance, sometimes called low-intensity exercise endurance, allows a person to perform activities continually for a long duration, whereas anaerobic endurance, or high-intensity exercise endurance, provides the ability to repetitively perform bouts of high-intensity exercise. Although most sports rely on some form of endurance, the type of endurance developed (high or low intensity) can significantly affect performance outcomes. Therefore, the coach and athlete must consider the type of endurance that the athlete needs for the sport and how the appropriate endurance will be targeted within the training plan. The coach and athlete must also consider the athlete's physiological responses to the methods for developing endurance. Once the type of endurance and the physiological responses are understood, the coach can develop a training plan to enhance sport-specific endurance.

The concept of endurance differs distinctly between various sporting activities and thus can be defined in several different ways. For example, the type of endurance that an marathon runner athletes needs provides the ability to continuously perform at a specific power output or velocity for a long duration of time. Conversely, a rugby player needs to repetitively perform periods of high-velocity movements for several time with periods of recovery. Although some form of endurance affects both athletes' performance, the development of endurance in these athletes will be distinctly different. If the wrong type of endurance training is implemented, the athlete might develop endurance characteristics that do not meet the needs of the sport, and thus performance capacity can be reduced. To understand the correct application of endurance training, the coach and athlete must differentiate between the two major types of endurance reported in the contemporary literature: low-intensity exercise endurance (LIEE) and high-intensity exercise endurance (HIEE).

Activities that are predominated by aerobic energy supply tend to exhibit lower peak powers and thus can be classified as being of lower intensities. These activities require the athlete to perform continually, at a low intensity, for a substantial duration. Thus, this type of endurance is often termed LIEE or aerobic endurance.

Sports that rely on anaerobic metabolism usually require high power outputs or the repetitive performance of high-velocity movements. Because anaerobic activities require higher power outputs than those seen in aerobic activities, anaerobic activities can be classified as being of high intensity. Therefore, the ability to sustain and repeat high-intensity exercise bouts is considered to be HIEE. The development of HIEE does not impair strength and power-generating capacity, as typically occurs when LIEE is developed.

Flexibility can be defined as the range of motion about a body joint. It refers to the state of the muscle's length, which restricts or allows freedom of joint movement. Flexibility is essential for optimum joint and muscle function. There are many excellent books on assessing muscle length and tension as well as joint function. Typical devices for measuring flexibility include manual and electric goniometers, which measure joint angle, and the sit-and-reach box, which is used to evaluate the combined flexibility of the lower back and hips. Flexibility measurements are more reliable when standardized warm-up and static stretching pre¬cede the flexibility assessment. During a flexibility test, the athlete should move slowly into the fully stretched position and hold this position. Ballistic stretching, characterized by bouncing to increase

range of motion, should be prohibited during warm-¬up and cannot be allowed during any flexibility testing.

Flexibility refers to the range of movement in a joint or series of joints, and length in muscles that cross the joints to induce a bending movement or motion. Flexibility varies between individuals, particularly in terms of differences in muscle length of multi-joint muscles. Flexibility in some joints can be increased to a certain degree by exercise, with stretching a common exercise component to maintain or improve flexibility. Quality of performance is enhanced by improving and maintaining a good range of motion in the joints. Overall flexibility should be developed with specific joint range of motion needs in mind as the individual joints vary from one to another. Loss of flexibility can be a predisposing factor for physical issues such as pain syndromes or balance disorders.

Many factors are taken into account when establishing personal flexibility: joint structure, ligaments, tendons, muscles, skin, tissue injury, fat (or adipose) tissue, body temperature, activity level, age and sex all influence an individual's range of motion about a joint. Individual body flexibility level is measured and calculated by performing a sit and reach test, where the result is defined as personal flexibility score.

Coordination is a complex ability and correlates closely with strength, flexibility, speed and endurance. If an athletes have poor ability in any of these areas, this can limit their development of coordination. When improving coordination, their should emphasize developing a large variety of skills and progressively increase exercise complexity. Variety is important in exercise selection and equipment used. For example, it is beneficial in the development of coordination to have perform activities and skills with their non-dominant limbs.

To assess coordination, agility and balance, complex multi direction movements are useful. Using unilateral movements and balance tests are also helpful to determine the athletes' abilities in these areas. Take care to look at how quickly or slowly they perform the various movements, remembering that the physiological basis of coordination relies heavily on the coordination of the various processes of the central nervous system.

B. Rugby

Rugby union like with many other team sports is a sport of intermittent activities of both high intensity and low intensity periods, with many gait changes performed during game phase. The ability to identify and understand the specific demands placed upon sports performers during match play and training situations has long since been recognized as a crucial factor in developing appropriate training and recovery program which may elicit improved performance. Important aspects for successful performance within rugby union match play include strength, power, speed and both aerobic and anaerobic capacity, with increases in size and strength amongst players noted to correlate with on field performance.

Increased commercial interest in rugby union since it became professional in 1995 has led to players receiving better analysis and management of training to optimize performance in matches, resulting in the game reported to becoming faster, containing more phases and involving bigger, faster and more physical players. A typical professional rugby season in the northern hemisphere contains over 30 games and involves blunt force trauma and high running volumes in training and matches

Rugby is a contact sport played over two 40-minute halves where high levels of force are both generated and absorbed upon impact. Teams are made of fifteen members, and players are divided into forwards and backs. The stereotype, with limited truth, is that forwards tend to be immobile and thrive on physicality. Their primary role is to secure possession of the ball. That's not to say, however, that attack is strictly off limits. In a game analysis conducted by the International Rugby Board, forwards completed an average 42% of passes at the 2011 Rugby World Cup. This shows that forwards are integral to an effective attack.

Conversely, if athletes have speed, power, and skill, they are often placed as backs. As rugby becomes increasingly dynamic, however, every player will need to be comfortable with the ball in hand and with making active defensive tackles.

Performance programs in rugby should center on the game's physiological, psychological, and logistical demands. While a periodized training plan might look perfect, rugby is far from perfect regarding movement. Set plays happen at high speed, and defensive players must decide how to best tackle the oncoming attackers. Predictable drills certainly have a part to play in practice, but it's important to progress toward more random drills.

Technical and tactical development have a direct relationship with the physical abilities also call biomotor abilities, the rugby player need to develop. These abilities include strength, speed, cardio endurance and coordination. The purpose of this paper is to present the profile of physiological Bio motor ability of Rugby athletes. In addition, it will critique my initial theories about the importance of the energy systems to this sport as well as ASEP's model. These critiques will be based on the findings of five peer-reviewed journal articles found using the SPORT Discus database. Due to the limited amount of resources and the absence of a Rugby specific model in the text, I also referred to Rugby since it is similar in many areas.

III. Result And Discussion

Biomotor Ability Profile of Indonesian Male Rugby Athletes

TABLE. I. DATA OF MUSCLE STRENGTH

Muscle Strength	Number	Percentage
Good	9	50 %
Average	7	38.8 %
Less	2	11.2 %
Total	**18**	**100%**

Identify applicable funding agency here. If none, delete this text box.

TABLE. II. DATA OF EXPLOSIVE POWER

Explosive Power	Number	Percentage
Good	16	89 %
Average	1	5.5 %
Less	1	5.5 %
Total	**18**	**100%**

TABLE III. DATA OF CARDIO ENDURANCE

Cardio Endurance	Number	Percentage
Good	0	0
Average	0	0
Less	18	100%
Total	**18**	**100%**

TABLE IV. DATA OF FLEXIBILITY

Flexibility	Number	Percentage
Good	1	5.5%
Average	14	77.8%
Less	3	16.7%
Total	**18**	**100%**

TABLE V. DATA OF COORDINATION

Coordination	Number	Percentage
Good	9	50%
Average	5	27.7%
Less	4	22.3 %
Total	**18**	**100%**

A. Discussion

As sport participation becomes more competitive, the rugby athlete are required to have good biomotor abilities. Good biomotor abilities will support athletes achievement. From the data of muscle strength, data of explosive power, data of flexibility and data of coordination (table 1, 2, 4 and 5) showed are good results, contrarily data of cardio endurance (table 3) showed are less. This may due to the aerobic training method given have poor; involve the intensity and duration of the training.

Cardio endurance training is any activity that involves the large muscles of the body (especially the legs) or rhythmic and continuous in nature (as opposed to stop-and-start) so that challenges heart and lungs to work harder. Activities like walking, jogging, running, cycling, swimming, aerobics, rowing, stair climbing, hiking, cross country skiing and many types of dancing are "pure" aerobic activities. Sports such as soccer, basketball, squash and tennis may also improve cardio endurance. However, cardio endurance training could improve performance in the sports include rugby. Athletes typically use three training methods to improve cardio endurance that is: 1). slow to moderate-intensity distance training, 2). moderate to high-intensity interval training, 3). high-intensity continuous training.

Mix high-impact activities like jogging or step aerobics with weight-supported activities like rowing and cycling can improve cardio endurance. The more muscles involved in the activity, the greater aerobic challenge. For example, cross country training have shown the highest aerobic capacity of all athletes. They vigorously use arms, legs and trunk muscles during training. One of the most important changes taking place during cardio endurance training is that working muscles become more efficient at taking in and using oxygen. If the athletes are getting ready for a rugby competition, the majority of preparation should involve running, using the muscles and motions are required. Running itself provides the best "sport-specific" conditioning for a rugby competition.

Tudor. O. Bompa has said that aerobic training intensity is 72 to 87% from maximal heart rate and duration of aerobic training is 30 minutes to 90 minutes and 3 times a week to guarantee increased aerobic capacity in about 8 to 12 weeks. Athletes utilizing high- intensity continuous training to increase their lactate threshold should exercise for 25 to 50 minutes depending upon their level of fitness. Interval training to improve aerobic power should involve low or high-intensity intervals of at least 60 to 90 seconds duration, with 1 to 2 minutes recovery in between

intervals. The coach could design the number and length of both training and rest intervals. Do not increase the time or distance by more than 10 to 20% each week. For example, if the athletes begin exercising for 10 minutes each session, only add 1to 2 minutes each week for the first couple months. It's smarter to go a little slow in the beginning. Even if the athletes feel could progress more quickly, the muscles and joints take longer to adapt to the stress of training than the heart and lungs.

Warm-up makes athlete workout feel smoother, prevents injuries, and helps the body move efficiently from a low to high metabolic state. Perform the activity will be doing for aerobic conditioning at a much lower level for about 5 to 10 minutes, or longer. Gradually increase the intensity of training until in target training range. The athletes can also include some flexibility training as part of warm-up. After warm-up a bit, stretch the muscles that will use during the activity.

Cool-down is a gradual reduction in the intensity of training. This helps bring blood that has been sent to the working muscles back into normal circulation. If athletes are jogging, gradually decrease pace and then walk for 5 to 10 minutes at the end of session. If athletes are cycling, reduce the pedaling speed or bike resistance during the last 5 to 10 minutes of training. The end of a workout is a great time to stretch to improve overall flexibility, because muscle

temperature and blood flow are high. Strengthening training may also be done at this time.

IV. CONCLUSION

From the above tables shows that muscle strength, explosive power, flexibility and coordination of male of Indonesia rugby athletes for Asian Games 2018 are good, meanwhile their cardio endurance are less.

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The Development Model of Training Techniques Shot Put O'Brien Style Based Biomechanical Studies

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***Abstract*— The purpose of this study is to know what students do, including basic techniques, glide, final stage, task, and repulsion performance. The research method used is Research and Development approach. Samples used in this study are students of vocational high School Kalijambe grade X TKR. Therefore, it is necessary to develop a learning media in accordance with O'Brien's style based on biomechanical studies. The draft model is ready to be reviewed by a multimedia expert and O'Brien style expert to get product validity. Based on the results of the final score calculation of the final test, it indicates a larger factor for the model provided by the exercise developed by the researcher. The use of style-based learning biomechanics on the O'Brien learning style can be effectively used.**

Keywords— shot-put, o'brien style, biomechanic.

I. INTRODUCTION

The trend of using social media becomes a must for adolescents to follow it, so it is not surprising with the number of television programs and the proliferation of television stations make the children more enjoy to sit in front of the television and play mobile phones. The existence of the changes above is an important signal to look for alternative solutions. From such conditions, finally educational practitioners think hard to formulate a new paradigm in education. Implementation of full day school is one alternative to overcome various problems of education, both in achievement and in terms of morals or morals. By attending full day school, parents can prevent and neutralize the likelihood of children's activities plundering on negative activities. One of the reasons parents choose and put their children into full day school is in terms of student education (Bahruddin, 2010: 230**)**

Physical education is part of education as a whole. According to Aip Syarifudin, et al "Physical education is a process through physical activity, designed and arranged systematically to stimulate growth and development, improve the ability and skills of the body, intelligence and character formation, and value and positive for every citizen to achieve educational goals" [13].

The purpose of physical education is the education of the child as a whole, to develop the individual child optimally which includes physical, mental, moral, social, aesthetic, emotional, intellectual and health changes [7] . The Physical Education is a process of education that utilizes physical activity and is planned systematically aimed at increasing individuals organically, neuromuscularly, perceptually, cognitively, socially and emotionally.

Schools other than as formal educational institutions, can also serve as a place of development and sports coaching. Evidenced by the inclusion of athletic sports into the school curriculum, from elementary school to vocational high School provide a positive impact in the world of education, in the development of athletic sports into a popular sport in Indonesia, especially on the throwing numbers, Indonesian athlete Eki Febri Ekawati won medals gold SEA Games 2017 at Bukit Jalil Stadium, Kuala Lumpur, Malaysia, from a shot put with O'Brien style with 15.39 meters repulsion performance. This extraordinary achievement of course requires hard training. Learn about the O'Brien style starting force from the ground level. At this stage, as a core exercise students learn basic engineering movements. Basic motion exercises or basic techniques of the O'Brien style, students must understand movement techniques properly and correctly so that students must really understand the basic techniques and concepts. Mastery of good basic techniques will provide an optimum blast effect. To be able to master good basic engineering skills requires regular and thorough training. Exercise can be done at school according to the curriculum applied in school. Given the limitations of school hours and the considerable curriculum content of the lesson, the exercises can be done on self-development activities outside the learning hours. In addition, training can also be done at home or at other places at any time and every opportunity. Because this basic technique training technique, the o'brien style requires accuracy in both techniques and trajectories, there needs to be guidance, direction and monitoring from teachers, instructors or trainers. The problem that then arises is, first the limitations of face to face does not allow teachers to monitor continuously the development of students' abilities, the second is the absence of practical learning media for the competence of the shot hit. The concept of learning that is currently being developed is active, initiative, creative, effective and fun learning. Of course this requires that the concept developed can foster student involvement. So without realizing directly by the students turns out students have been involved in a deep and deep in the learning process.

Many factors that affect student learning outcomes, one of which is a problem in learning activities. The causes of learning problems can be sourced from internal and external factors such as student motivation and enthusiasm of learning materials. While external factors include the family and the surrounding environment that can be teachers, environment, materials, media and methods used by teachers. Lack of student participation in following the lesson will reduce the success rate of students in learning. Therefore it is necessary to take action that is able to involve the active role of students in following the learning to achieve the learning objectives, the development of model of basic technique skills exercise based on O'Brien biomechanics study is expected to be one alternative to improve student achievement and learning outcomes. In addition, there is an increase in the number of students who participate in the learning both in the classroom and in extracurricular activities held in schools as well as groups of athletic associations outside school.

II. METHOD

This research method using Research and Development approach. While the selected research development model is an educational research and development model developed by Borg and Gall. Educational research and development (R & D) is a process used to develop and validate educational production [4]. In that sense, the series of steps of research and development is carried out cyclically, and at every a step that will pass or do always refer to the results of previous steps until eventually obtained an educational products

As described in the previous discussion of research model development Borg and Gall covers ten steps as follows: 1). Preliminary Study, 2). Planning research, 3). The development of the initial product, 4). The field trials early (limited), 5). Revision field test results is limited, 6). field test broader, 7). Revision field test results, 8). test the feasibility , 9). Revised results of due diligence, 10) dissemination and socialization of the final product.The design of skills model based on biomechanical study involves several elements of the developer of personnel who served as the designer of content / material, vidio takers, images and computer programming experts. The expert sources involved in designing and manufacturing this research product are product designers, O'Brien style experts, vidio takers, images, image editors, vidio editors, script makers, and computer programming experts. The production of the product remains in the control of the researcher as the principal product designer so that the expert resource involved only acts as a technical and consultant.

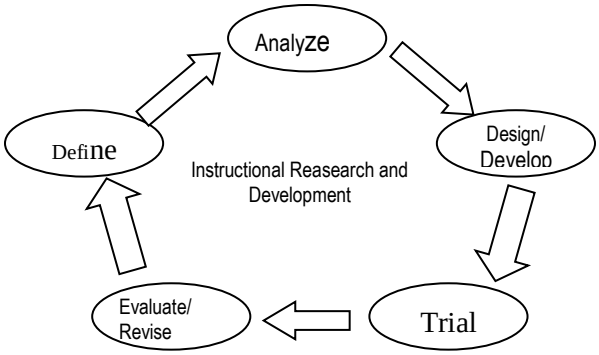

Fig. 1. Model Development Cycle Borg and Gall(1989:782)

Qualitative analysis relies on observations by the coach or the motion analyst either directly or through video recording. This corresponds to the nature of qualitative research in which researchers (trainers, analyst) is the main instrument. Although it emphasizes the role of analysts of motion, approach Qualitative analysis still uses tools in the form of software to analyze motion. The difference, in qualitative analysis the focus is the pattern, not the quantification of the data. If analysis quantitative methods are generally performed by researchers, qualitative analysis is more appropriate for teachers, trainers, physiotherapist, and artistic sports jury [3]. Video taking is captured using the 8x 5.0 -40.0 mm canon ixus zoom lens which is positioned at the diagonal level of the platform at a distance of 3 m from the movement of the shot-put Obrien style, and analyzed its biomechanics using kinovea software and softwere skysoft.

III. RESULT AND DISCUSSION

A. Result

Preliminary stage in this research is the analysis of the need to identify the problem, in this study needs analysis done using the facilities through the online questionnaire distributed via facebook account. There were 40 respondents who responded with 97.4% of whom were teachers / lecturers PE. The following detailed data questionnaire count results.

Expert evaluation used in this study used 3 experts with different background of ability, that is 1 multimedia expert, 1 expert of O'Brien and 1 expert in both field that is multimedia and shot put.

With quantitative data quantity assessment or expert test with a score of 78.24, then based on the criteria of eligibility level according to Arikunto (2009: 44) can be interpreted that the product design development model of basic technique skills training Rejects O'Brien based biomechanics review can be tested at a later stage [1].Comparative mastery of the basic technique of start-up O'Brien style force based on the difference in final test score minus the initial test in the experimental group and the control group. Test the normality of population frequency distribution.Before doing the data analysis need to be tested the distribution of kenormlalannya. Test the normality of data in this study using Lilliefors method. The Lilliefors test is used when the sample size (n) is less than 30 [14]. Suppose a random sample with

observations: x1, x2, ...xn. Will be tested whether the sample comes from a normal distributed population or not.

The model product of basic technique training techniques of O'Brien's integrated bullet-wielding force in the learning media based on the O'Brien-style O'Brien-style biomechanical study developed by the researcher can improve the basic technique skill of start-up style at O'Brien level at SMK Negeri 1 Kalijambe effectively.

TABLE 3.1. Conclusions Quantitative Data Evaluation Expert

No	Basic Technique	Experiment Group	Control Group
1	Prefix	22,0 %	5,0 %
2	Glide	24,0 %	19,0 %
3	Final stage	17,0 %	6,0 %
4	Repulsive	25,0 %	17,0 %
5	Move up	18,0 %	6,0 %
6	Repulsive Achievement	16,0 %	2.0 %

TABLE 3.2. Comparison of Basic Technique Capability Improvement Basic O'Brien style shot put at the Experiment Group and Control Group

No.	Evaluation Aspects	Skor	Skor Maks	Results %
1	Multimedia Experts	30	40	75,00
2	Practitioner Expert O'Brien style	23	30	76,67
3	Expert Multimedia and shot put	53	65	83,07
Jumlah		106	135	78,24

Fig. 2. Model of Basic Technique Skills Training Shot-Put Obrien Style Based Biomechanics Review

B. Discussion

Biomechanics as a new term / word popular in the 1960s. The history of biomechanics itself is part of the history of kinesiology (the science of human motion) which began to be used in the late 19th century. The book, titled Scientific Principles of Coaching by John Bunn published in 1955, is the first text to emphasize the mechanical aspects of sports movement. In the previous period, the discussion of sports movement more emphasized aspects of anatomy. The next development, in 1967, was held the first international biomechanics seminar in Zurich, Switzerland. A year later the Journal of Biomechanics for the first time was published. Several papers in it raised the topic of sports biomechanics. From an institutional standpoint, the American Society of Biomechanics was born in 1977 and in the early 1980s the International Society of Biomechanics was established [10]. The factors that influence intrinsic motivation are, Needs A person performs activities due to the presence of both biological and psychological needs factors, Hopeancy A person is motivated by success the hope of success is self-gratification, success and self-esteem increases and moves a person towards the achievement of goals [5]. Interest Interests is a sense of preference and a sense of desire for something anpa somebody tells. Based on the above understanding, it can be concluded that intrinsic motivation is a motivation that requires stimulation or encouragement from within individuals. Biomechanics can be interpreted as a study that uses the concept of mechanics and machines to express human motion efficiently [12]. The definition provides an illustration that sports biomechanics can be interpreted as a science that studies the internal and external forces acting on the human body as well as the effect that the force generates on sports activities.

The research was conducted on November 27, 2017 until March 29, 2018. Furthermore, the object is the vocational high school students Kalijambe Sragen, Sragen regency. This research uses R & D development research method developed by Borg and Gall. Borg and Gall's model development research includes the following ten steps: 1). Study Introduction, 2). Research planning, 3). Initial product development, 4). Initial (limited) field trials, 5). Revision of field test results is limited, 6). Wider field test, 7). Revision of field test results, 8). Feasibility test, 9). Revision of feasibility test results, 10) Dissemination and socialization of the final product. This research is also called 'research based development', which emerges as a strategy and aims to improve the quality of education. The population of this study involved students SMK N 1 Kalijambe, Sragen owned with a total of 528 students. Maksum states "random sampling is a sampling technique that provides equal opportunities for individuals who become members of the population to be elected as a sample member" [9]. Furthermore, a random sampling method is used to select samples in between population.

In this study sampling as a research subject is a student class X TKR, then taken at random without choose according to the levels and the age limit. The number of samples taken in

this study were 31 male students from a total of 204 students. Details of the sample in this development study are as follows: (1). Test small group using 6 samples. (2). Large group tests used 12 samples. (3). Product effectiveness test: the experimental group used 12 samples, the control group used 12 samples.

Data analysis techniques in this study using data analysis techniques descriptive. The descriptive analysis is used to analyze the data in a way describe or describe the data that has been collected as is without the intention of making conclusions that apply to the public or generalization [15]. In this study used two kinds of descriptive data analysis techniques which will be done, that is descriptive qualitative data analysis and descriptive data analysis quantitative. Qualitative descriptive data analysis was conducted to analyze the result data observations made on preliminary studies conducted by the researchers before entering the field, and also the result of charging questionnaires and expert questionnaires against draft models that have been prepared by researchers then analyzed by experts prior to implementation. The process of data analysis begins by examining all available data from various sources, ie from interviews, observations already written in field notes, personal documents, official documents, pictures, photographs, Stage of data analysis conducted in this research as done that is: (1) data reduction, (2) data presentation, and (3) drawing conclusion [11].

From the calculation results of significance tests can be interpreted that, the test results data obtained from the subjects miss one or more. All indicate that the results of the count reject Ho with a count value that is far above the value of t table. All showed significant improvement results due to improvements in the results of the basic technique skills of O'Brien style shot-put force increased by 16.0% - 25.0% in the experimental group and 2.0% - 19.0% in the control group. Based on the results of calculating the difference in scores after completion of the final test, showed a greater score difference for the group given the treatment model of the exercise developed by the researcher. . In the axiological perspective of sports science, in accordance with Law no. 3 years 2015 on the National Family System, sports activities can be divided into three types, namely: sports education, recreational sports and sports achievements [17]. An explanation for the sport of achievement has been much mentioned above. In sports education, sports biomechanics play a role for the development of science. Biomechanical analysis is based on scientific evidence. Research and development of the theory of sports biomechanics into the area of educational sports. The emphasis of biomechanical analysis on recreational sports is more directed at injury prevention. How safe movement in exercise can be the focus of his study. Hopefully, a healthy sport does not turn into a disaster because of a mistake in the motion. Soeharsono highlighted the different functions of sports biomechanics in education physical and sports. In some ways, between physical education and sport are present meaningful differences even though physical education is always equipped with sports. On physical education, the teacher's knowledge of sports biomechanics is sufficient to (1) analyze the technique safe, effective and efficient motion, (2) distinguish between right and wrong motion techniques, (3) evaluate: identify errors then correct, and (4) find new ways better [16].

IV. CONCLUSION

This preliminary study was conducted one of them through research of opinion polls to the public, especially sports teachers throughout Indonesia through an online questionnaire disseminated through social networking. Expert evaluation results for quantitative data obtained in the form of the final percentage of expert evaluation is 78.24%, so it can be interpreted that the product design development of the basic technique learning style of O'Brien can be continued on the production of the model of the basic technique skills training technique obrien-based biomechanical studies, and proceed to the trial at a later stage Based on the results of the research can be concluded that athletic sports on the shot putt number of O'Brien style is a sport that has good prospects to be developed towards achievement.Product development model Basic technique training technique of O'brien style shot-based force based on biomechanical study based on test results of significance to the experiment can be concluded can improve Achievement and mastery of basic technique of starting O'Brien style at SMK Negeri 1 Kalijambe Sragen effectively and efficiently. This is based on the result of calculating the difference in the final score increase after the final test which showed a greater score difference for the group given the treatment model of the exercise developed by the researcher.

SUGGESTION

1. For Students:Students are expected to pay close attention to the contents as well as giving instructional materials on basic technique skills of the O'Brien style wielding force based on biomechanical studies.
2. For Teachers

For teachers, the use of interesting learning media can motivate students should always be developed in order to better motivate students to explore themselves tminat and about his own talent and can be developed toward achievement.

3. For Researchers

For researchers who will develop the learning model of O'Brien's style of reject should pay attention to

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Fundamental Movement Skills Game on Intellectual Disability Children in Primary Special Education

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***Abstract*— The Fundamental Movement Skill (FMS) of the intellectual disability (ID) children, whether it is mild or moderate, has a disorder, therefore there is a need to guide the ID of the child on optimal FMS and gain pleasure through movement. Getting game exercise is one form of game designed purposely by researchers for children with mild ID in Primary of Special Education through this game is expected to provide an opportunity to stimulate motor skills, especially the FMS of children with mild intellectual disability repeatedly and can develop ideas according to his own ability. The method used in this research is the research and development of Borg and Gall, the subject of a limited-scale trial of 10 students of Intellectual disability children primary school (SDLBC), and 3 teachers. The subjects of large-scale trials amounted to 30 students in SDLB C in the third SDLB C in the city of Palembang. The FMS game model Let's get exercise designed by researchers is expected to improve fundamental movement skills, cognitive skill, fun and focus attention of children with ID.**

Keywords—fundamental movement skill, game, intellectual disability children

I. INTRODUCTION

Every human being in this world always wants the best in his life, get the best partner, have a decent life, have a healthy body physically and spiritually, not least couples who are waiting for the birth of the baby has the desire, dream and hope which is very big if the baby will be born healthy physically and mentally, then the baby grows and develops healthy, strong, smart and active like normal children, but sometimes the reality is not all in accordance with what is expected because of several factors , there are some parents who get special gift from God, one example is a child born in the condition of the abnormalities that resulted in disturbances in the development of sensormotory.

Children with special needs are children with special characteristics such as intellectual disability (ID) that are different from children in general. ID is a challenge that is hard enough for most parents, not a few parents who complain that taking care and caring for children with ID require extra energy and attention because it is not as easy as doing it in normal children, but parents should address such things positively in order to find the right steps in order to optimize the development and the potential of the child.

The lack of physical activity to be a significant behavioral risk of health among people with ID [3]. Physical activity studies of people with ID identified significant inactivity and associated behavior risks of health in a majority of this population [10]. Physical exercise and various sports-related activities are necessary to promote health, fitness, and psychological development among children of school age. In general, the ability to play sports and exercise is lower for children with intellectual disabilities than in children without such disabilities [6]. Children with intellectual disabilities often have psychological problems associated with carrying out exercise. Moreover, their experience of exercise is limited.

Play activities as a means of enhancing the fundamental movement skills of the ID children listed the following objectives in child-centered play theraphy: (1) help the child enhance his or her possitive self-concept, (2) help the child move to accepting more responsibility for self, (3) help the child reach enhanced levels of self-acceptance, self-reliance, and self-direction, (4) help the child practice self-directed decision making, (5) help the child feel more in control, (6) help the child increase his or her awarness of the process of coping, (7) help the child develop an internal locus of evaluation, (8) help the child learn to trust himself or herself more [7].

The qualitative aspect of the movement displayed by the child, remains dependent on effort, ie how one combines the sharing of elements / factors (time, load, space and flow). Therefore, the idea or theme of movement is essential, meaning that in teaching the movement in children should be tailored to the characteristics of the students. That play should be done on the initiative of the child and on the child's own decision [11]. Play should be done with a sense of fun, so that all play activities are fun will result in a learning process in children. Meanwhile, according to Piaget in Yuliani [2009: 34] said that play is an activity that is done repeatedly and cause pleasure / satisfaction for a person.

In learning motor skills, children need basic skills experience (locomotor motion, non locomotor and manipulative) [18]. Children should learn to perform simple moves before connecting them into more difficult movements, before mastering a motion skill, children should be given the opportunity to do the exercises. Children should have the opportunity to try, correct and try again. Children will improve their motor skills based on their previous play experience. Memory plays an important role for children in learning motor skills. The child needs to recall what he or she has done in order to correct and correct it. To learn motion skills, children must combine memory or memories with previous experiences, take advantage of opportunities to try something new, and practice what they have learned [14].

Fundamental movement competence is linked to physical activity in both children with and without disability [1]. Locomotors and manipulative skills form the foundation for future movement and are considered essential for the development of more complicated or sport-specific motor skills [2, 15]. Moreover, locomotor and manipulative skills as indicators of physical skills mastery consequently enabling enjoyable participation in physical activities [5]. Study of correlation between physical activity in children with physical disabilities showed that physical and biological factors such as physical functioning ability and gross motor function were found to be consistently associated with physical activity, suggesting that increased physical and motor functioning is associated with higher levels of physical activity [9].

Play is essential to development because it contributes to the cognitive, physical, social and emotional well-being of children and youth. Play also offers an ideal opportunity for parents to engage fully with their children [4]. Play is a fun activity for children. The game itself can provide an opportunity to practice the skills of the children with intellectual disability repeatedly and can develop ideas according to his own ability, therefore learning pemas should be able to provide opportunities to play in children with intellectual disability in the school environment.

Play is strongly affected by the the child's context, including family and peers, socio-economic influences, and availability of time. What is concidered play by one child may seem totally innappropriate an even distasteful to another child based on his or her prior experiences and personal preferences. Play is viewed as child-initiated activity that is not structured by an adult and does not have skill acquisition as a goal [12].

A. Game Model

The game Let's Get Exercise is one form of game designed purposely by researchers for children with ID in SDLB C. The Game Name Let's Get Exercise is taken from one of the themes contained in the 2013 Curriculum Master Handbook which is the theme of My Enthusiasm the subtheme is Sports Enthusiasm. The game consists of: Post 1, Post 2 and Post 3. Each post has different basic tasks and motions but is still adjusted to the Competency Standards and Basic Competencies that exist in the Curriculum. The motion tasks that exist in this game is the basic motion goes walk forward, run forward, and underhand rolling and combined with other learning materials such as; simple counting, mentioning / showing images, recognizing color through flashcard media. This game can be implemented at the time of learning at school and can be used as a form of therapy for children tunagrahita at home and done repeatedly so as to improve the basic motion skills of children. The benefits in this game are to stimulate the visual and tactile in the child's tunagrahita in performing the task of motion balance and coordination [Sullivan, et al, 2012: 76-77].

The game aims to; (10) improve the fundamental movement skills of the child with intellectual disabilities, walk forward, run forward and underhand rolling the balls, (2) by looking at the picture on the flashcard the child can name the sports, (3) increase sensory child with texture varies, and (4) recognizes the basic letters, numbers and colors (red, blue and yellow). Equipment Used; six evamatt pieces of 30 x 30 centimetres (cm), each modified with a different texture (synthetic grass, large smooth stone, plastic bottle cap, dacron, clay and little stones), box (container) and flashcard with branch / sport shaft, colored tape, flag (marker), and whistles. Instructions; the child stands ready behind the starting line, after hearing the cue from the teacher (whistle) the child immediately performs a straight forward movement on the texture as far as 2.4 metres (6 pieces of modified evamatt of various textures). It is endeavored to keep the child's point of eye focus straight up to the finish line. Once at the end of the line, the child takes one of the flashcards containing the image of the sports stalk and mentions it firmly.

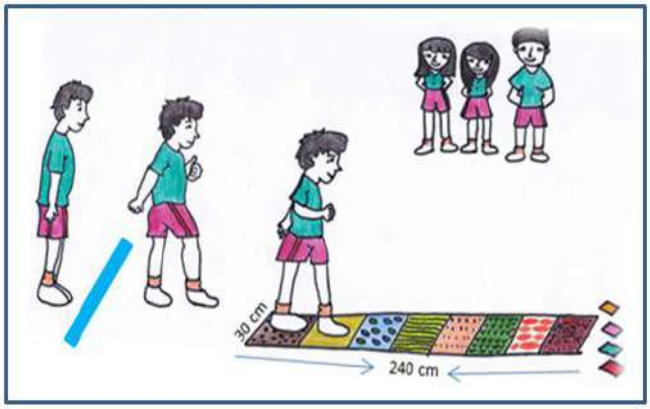

Fig.1. Game Model Post 1

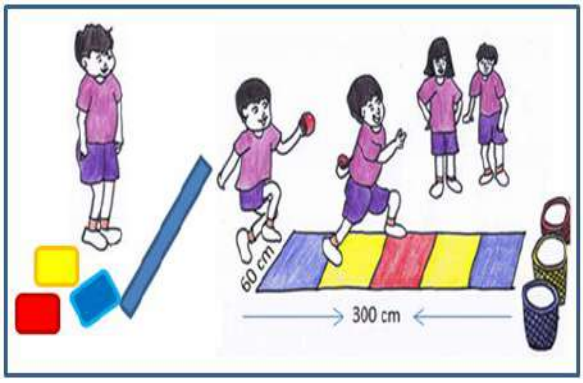

Fig. 2. Game Model Post 2

Equipment used; five pieces of evamatt measuring 60x60 centimetres (cm), three baskets (blue, yellow and red), three basic colored bean bags (red, yellow and blue), tape (colored tape), flag (marker), and whistles. Instructions the game are; the child stands ready behind the starting line. Upon hearing the cue from the teacher (whistle) the child immediately performs a run forward as soon as possible to move 3 pieces of bean bag to the basket that has been provided as far as 3 meters. The child's eyes focus remains straight forward, the arm shaping the elbow opposite to the legs and the body slightly leaning forward during the run, After all the bean bag moved the child back to the starting line, then leave the game area.

Equipment used; Three pieces of rubber ball 15 cm in diameter, twelve evamatt pieces measuring 60 x 60 cm, six colored plastic glass (marker), colored tape, and whistles. Instructions; The child stands ready behind the starting line. Upon hearing the cue from the teacher (whistle) the child immediately performs the first underhand rolling the first ball with a distance of 1.5 meters (the child takes the ball with one of his hands, then the child bends the knee while swinging the arm backwards to the next front, eyes focus towards the target and the ball ready to be released / rolled). After rolling the first ball, the child must return to the ready position to roll the second ball with a distance of 2 meters. The child returns to the ready position and moves the last (third) ball with a distance of 3 meters. See figure 3 below :

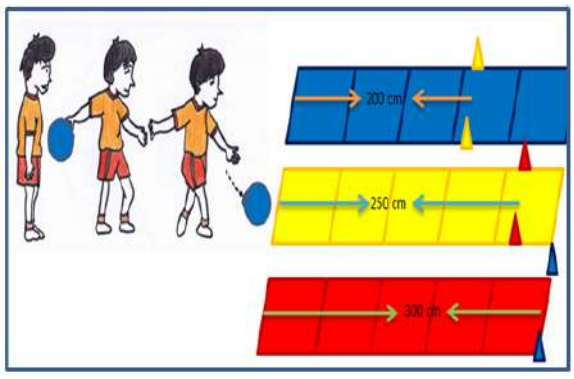

Fig. 3. Game Model Post 3

II. METHOD

This study aims to produce a product of a model fundamental movement skill game for intellectual disability children in special education using Borg and Gall's research and development process (R&D). The subject of the limited-scale trial amounted to 10 students of grade 1 Special Education of Karya Ibu Palembang, 3 teachers (physical educator and teacher class). Extensive trials of 30 people, and 9 teachers (teacher and classroom teachers) Special Education of Palembang City (Karya Ibu, YPAC and Pembina).

III. CONCLUSION

The Fundamental Movement Skills (FMS) of the children with mild or moderate intellectual disability has a disorder, therefore a need to guide the child's intellectual disability on optimal FMS and gain pleasure through movement. The FMS game model Let's get exercise designed by researchers is expected to improve fundamental movement skills, cognitive skill, fun and attention focus of the intellectual disability children, so that the child's intellectual disability can live the daily life independently of others.

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Artistic Swimming Helps the Intelligence Development

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***Abstract*— Artistic swimming is a branch of sport which has an element of swimming, gymnastics, ballet, and dance. There are two kinds of training; land training and pool training. The training which is done on the land to increase physical capacity. Moreover, the training done in pool to improve skills. Appearance presented is very complex, so it involves more than one intelligence in a performance of artistic swimming. This study aims to see the form of intelligence contained in the artistic swimming. The object of this study is the national artistic, during eight months in Yogyakarta. The method of the study which has been implemented is the investigation of the phenomenon record that happened in the field and the confirmation toward the object and the informant about the phenomenon. The results showed in a display of artistic swimming can involve eight forms of intelligence as well. The involved intelligence in it is musical-rhythmic, visual-spatial, verbal-linguistic, logical-mathematical, bodily-kinaesthetic, interpersonal, intrapersonal, and naturalistic. Some intelligence capabilities can sometimes be performed simultaneously at a time. Benefits of the research shows that the activity of artistic swimming is not just a physical activity, but has the advantage of helping children develop multiple intelligences.**

Keywords*— *multiple intelligences, artistic swimming

I. INTRODUCTION

Artistic swimming are not as well as known with swimming, diving, and water polo. But it is unique compared to other aquatic sports, under the auspices of PRSI (Persatuan Renang Seluruh Indonesia). In the appearance of the artistic swimming displays the physical abilities and beauty of movement as well as the harmony of music. This sport is less popular than other sports under PRSI. So the number of available human resources is still limited. This is evident from the national team members set up to face the 29th Seagames in Malaysia, only 10 athletes from four provinces of DKI Jakarta, West Java, DI Yogyakarta and South Sulawesi.

This becomes a challenge - for the team of coaches to form an excellent team. To prepare the excellent team required several factors supporting the development of athletes. Exercise factors consist of physical exercise, technique, tactics and psychology, a unit used to achieve peak performance in sports (Bompa and Haff, 2009). The exercises prepared by the trainers for the swimmers consist of the type 2 exercises that are the exercises on land and in the pools. Land training encompasses gymnastics, ballet, yoga, and physical conditioning. Meanwhile, water training consists of classic swimming, basic techniques of artistic swimming, and routine set. This sort of training can form the better physical ability of the artistic swimmers than another kinds of swimmer [5].

In the artistic swimming competition is categorized in three forms of appearance that is solo, duet and team. The three categories are become into 10 competition numbers: solo free routine (FR), solo technical routine (TR), duet FR, duet TR, duet mix FR, duet mix TR, FR team, TR team, combo team, and team highlights. They have different conditions between Of the 10 competition numbers. There are different interactions between swimmers at different competition numbers.

The differences not only about the number of swimmers but also seen from the duration of the performance of athletes and choreography provisions are displayed. On an artistic swimming number requires companion music, choreography and physical abilities. The choice of good

companion music has a diverse tempo. Choreography is a series of movements consisting of basic movements and creative movements. For companion music and choreography have alignment. While the physical ability is the main capital in displaying the perfection of the display. The complexity of the artistic swimming not only focuses on physical ability but there is an art factor in its appearance.

The elements of contained in a artistic swimming, demanding a swimmer must have the ability and skills are diverse. In persuan of Piaget (Hergenhahn and Olson, 2008: 313-316) intelligence is a congenital innate trait that can change dynamically because of biological maturity and experience. While in the formation of knowledge Piaget introduces the scheme, assimilation and accommodation.

An individual can have seven different intelligences [8]. An individual not only has one kind of intelligence, will be able to have some intelligence in him. Intelligence is not solely about Classroom lessons, as people now know. Some intelligences can be developed simultaneously. Multiple intelligences are needed all the time from preparation to peak performance. The purpose of this study is to see the form of intelligence needed for artistic seater swimmers. The benefits of research show that seating activity is not physical

expression. But it has advantages in helping children develop multiple intelligences.

II. METHOD

The study has been conducted in the training centre of national team for the artistic swimming which is held in Yogyakarta during eight months. The participant is the artistic swimming athletes including female swimmers of 12-24 years old. The method of collecting the data of this study is narrative method which means that finding the data through the interview toward the informants by taking a note and recording the information. The information is gained from the stories which have been delivered by the informants, with no treatment involved from the researchers. The technique of collecting the data is done by collecting the documentation, while the narrative note is gained from the subject of the study and narrative interview from the researchers [4]. Moreover, the observation was completed through the direct observation toward the training process which is done in the training centre. The researchers did not give any treatment toward the object of the study, but only seek for the information. The information were gained from the interview of some informants on the occurrences. The informants consist of the swimmers and the trainers.

III. RESULTS AND DISCUSSION

A. The terms competition of the artistic swimming

In the artistic swimming competition is categorized in three forms of appearance that is solo, duet and team. The three categories are divided into 10 race numbers: solo free routine (FR), solo technical routine (TR), duet FR, duet TR, duet mix FR, duet mix TR, FR team, TR team, combo team, and team highlights. Of the 10 competitions numbers have different conditions between one and the other. The differences of these provisions can be seen in the table 1:

TABLE 1. DIFFERENCES CONDITIONS OF COMPETITION NUMBERS

Compn umbers	**Participants**	**Duration**	**Conditions**
Solo FR	1	2’ 30”	The series of motion is composed of basic movement techniques freely. Added motion variations.
Solo TR	1	2’ 00”	The series of motion is composed of basic movement techniques freely, including 5 compulsory movements that have been determined by FINA. More variation movements can be added to beautify the look.
Duet FR	2	3’ 00”	The series of motion is composed of basic movement techniques freely. Must make moves with lifting technique. Added motion variations
Duet TR	2	2’ 20”	The series of motion is composed of basic movement techniques freely, including 5 compulsory movements that have been determined by FINA. Then must perform lifting technique. More variation movements can be added to beautify the look.
Duet Mix FR	2	3’ 00”	The number of races is done in pairs with different sex. The series of motion is composed of basic movement techniques freely. Compulsory to make movements with lifting techniques. Added motion variations
Duet Mix TR	2	2’ 20”	The number of this race is done in pairs with the different sex. The series of motion is composed of basic movement techniques freely, including 5 compulsory movements that

			have been determined by FINA. Then must perform lifting technique. More variation movements can be added to beautify the look.
Team FR	4-8	4’ 00”	The series of motion is composed of basic movement techniques freely. Must make moves with lifting technique. Added motion variations.
Team TR	4-8	2’ 50”	The series of motion is composed of basic movement techniques freely, including 5 compulsory movements that have been determined by FINA. Then must perform lifting technique. More variation movements can be added to beautify the look.
Team Combination	4-10	4’ 00”	The series of motion is composed of basic movement techniques freely. Must make moves with lifting technique. Choreography variation is a combination of solo, duet and team.

Each of these competition numbers has different demands on the swimmer. Physically, the demands are the same for every swimmer for every competition number. The difference is seen in the psychological factors of swimmers. In this study know the favorite race number of the ten swimmers. Here's a table about the choice of competition numbers and the reasons they put forward.

TABLE 2. FAVORIT COMPETITION NUMBERS

Favorit numbers of competition	**The reasons**
Team FR	The FR team is considered to be more free in preparing the movement because it can design a more varied and attractive choreography. In addition they chose this number because it did together with many friends. The presence of friends makes more daring to appear and excited.
Team Combination	Their combination numbers judge that this number is more colorful because in a choreography it should display solo, duet and team numbers in one view. They also said that this team number has a performance value that can attract a lot of audience attention.
Duet FR	The reasons swimmer to choose duet FR are revealed that felt no confidence to perform solo. And less comfortable with people. They claim that with both of them they can build cooperation and more easily achieve cohesiveness.
Solo FR	Feeling to be yourself, and being able to present herself. Accept the risk of own error without having to pay attention to others. They do not want to be a burden to the team because of a mistake made.

Although swimmers have favorite numbers, not necessarily they will follow the race on that number. They will perform based on the coach's assessment of their abilities. So there is a learning process in the swimmers, including social learning. The learning process undertaken indirectly increases the ability of the swimmers, beyond the artistic pooling capabilities.

B. Multiple intelligences in artistic swimming

Changes that occur in individuals can be caused by the process of habituation. Implicit in habituation exemplary [15]. Some research deliberately habituates to get a new attitude on the individual. A research states that the formation of character is done through planned habituation through activities outside of learning [9]. Then provision of reinforcement as a business habituation of fair play in physical education [10]. From this research is clearly seen a deliberate treatment. The habituation done in a artistic swimming is not a separate, structured effort. But it is a mandatory requirement but must be met in order for their appearance to be good.

In observations made it was found that the artistic pool influenced and influenced individual intelligence. The intelligence found in the beautiful pool includes 8 multiple intelligences from Gardner [2, 8]. Multiple intelligences are:

- Musical intelligence. The intelligence possessed by the individual in recognizing the type of sounds, recognizing the low-tone, recognize and enjoy the rhythm to be able to create and appreciate the tone. Music gives personality influences, different rhythms have different effects [12]. This intelligence is used by swimmers in making alignment of movement with music. Under the terms of the FINA assessment, music alignment with movement only contributes 10% of the value. There are two opinions of swimmers about the meaning of music. First they use music to lure count and form movements. The second opinion, they feel helpful in animating the movement with the presence of music. Manner in moving the body or motion with taste also has a weight of value. Intelligence gives the advantage to understand the tone and creates a harmony of motion [1].

- Kinesthetic Intelligence. Ability to control body movement in motion activity with special skills and specifik is the intelligence of body movement. Certainly the artistic swimming is influenced and influenced by kinesthetic intelligence. Motion skills are not only a form of sport but also in the form of dance. It is a key ingenuity factor to be a good swimmer. Kinesthetic intelligence has support for the development of other intelligences [14].
- Logic-mathematical intelligence. Individuals with mathematical logic intelligence have the sensitivity and ability to distinguish between shape and space, logically recognizing mathematical or numerical patterns, the ability to handle long chains of reasoning. Swimmers should be able to measure the speed of movement and speed of swimming. In some obligatory movements on the TR, it must be done at different speeds. And must be able to do an estimate the amount of movement angle both on hands and feet. In addition must be able to understand the amount of angle in the direction of movement.
- Linguistic intelligence (language). Sound sensitivity (sound / pronunciation), structure, meaning, word function, sensitivity to the word as a function of language and mastery of language, is the ability of imdvidu who have linguistic intelligence. In this study the swimmers were forced to understand English. Foreign trainers use English to deliver programs and evaluation exercises. In addition the swimmers must be able to understand the innate language of their respective regions. The environment that communication ability. Learn to express opinions to other friends. Redefine and construct linguistic intelligence through four-factor linguistic knowledge, pedagogical knowledge, valuing linguistic and cultural diversity, and linguistically responsive teaching behaviors [17].
- Visual / spatial intelligence. This intelligence is characterized by sensitively perceiving the spatial-visual world accurately and transforming initial perceptions. In this intelligence is used so that children can take into account the direction of motion together so as not to happen a collision. Movements also changes the shape of the position pattern. Imagining movement can support improving performance (Parikh; 2015).
- Interpersonal intelligence. The capacity to differentiate and respond to the environment matches the mood, temperament, motivation, and desires of others. The ability to control oneself. Used to interact with teammates. This process is built in and out of practice. Togetherness makes the swimmer learn to understand others. They are an inseparable unity. Interacting in a team causes an artistic swimming of attraction, because it always interacts with a partner or other team members. Results of research conducted on a hockey team, interpersonal intelligence has a role that is specific and specific in team sports [7].
- Intrapersonal intelligence. Individuals with the ability to understand their own feelings and the ability to distinguish emotions, knowing about the strengths and weaknesses themselves are individuals who have intra-personal intelligence. This intelligence can be self-strengthening. It develops in swimmers. This ability also serves to understand the attitude of others to themselves. Intra-personal intelligence was determined as the highest intelligence area [18].
- Naturalis intelligence. Expertise in the recognition and classification of the numerous species the flora and fauna of an individual's environment. This also includes sensitivity to other natural phenomena. this intelligence helps the swimmers punctuality, speed and energy used to perform lifting movements. They can apply physics theory in theirs performance. Naturalist intelligence will develop with direct experience as an effort to obtain information. besides this intelligence the same thing happens in spatial intelligence and konestetik

Artistic swim performance like a dance performance. Using the music accompaniment during the show, with beautiful movements, in harmony with music and costumes. Some swimmers reveal artistic swim is a fun activity. Concomitant with a study, represent are an activity involving multiple intelligence is a very fun activity. [13]. Other research, revealed that physical education can help the development of multiple intelligences [3]. Thus it can be said that artistic swimming is a physical activity that can help to improve intelligence in children. this activity involves 7 of 8 intelligences have Gardner in practice and appearance. So it is an ideal sport

activity in stimulating the development of child intelligence.

IV. CONCLUSION

Artistic Swimming is a sport with high complexity. The advantages of practicing this sport are not just body fitness. There are advantages obtained that 7 multiple intelligences can be simultaneously developed. Exercise can have an impact on the practice of multiple intelligences. So it can be said that between multiple intelligences and artistic swimming give a reciprocal effect. Not only artistic swimming conditions that require multiple intelligences but multiple intelligences can develop exactly with the excitement given during the beautiful swimming exercise.

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Development Ability of Aerobic and Anaerobic Capacity on Children Age 6 to 12 Years Reviewed from Topography Link and Sex in District of Bima

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***Abstract*— This study aims to determine the development of aerobic and anaerobic capacity and capability in men and women aged 6 to 12 years living in the coastal areas. And also the comparison of aerobic and anaerobic capacity building capabilities of boys and girls at the age of 6 to 12 years living in the coastal areas with those living in mountainous areas of the Western Bima Nusa Regency. The research method used is the development research method of Cross-Sectional (research the developmental cross sectional). Average anaerobic capacity in boys in coastal areas. While the average aerobic capacity in boys in mountainous areas of age 6 years 19, age 7 years 23, age 8 years 26, age 9 years 39, age 10 years 38, age 11 years 46, and age 12 years 62 Average 128.2. Based on the results of this study can be concluded that the development of aerobic and anaerobic capacity capabilities both in coastal areas and in mountainous areas experienced a consistent development in each year. The average development of boys is high compared to women in the district of Bima.**

Keywords*— *development of aerobics, anaerobic, children, topography, sex

I. INTRODUCTION

Physical development is one of the most important factors in the development of the individual as a whole. This physical ability affects the performance of individual movements that will lead to the achievement of sporting achievements. In achieving sporting achievements requires time and long-term coaching process, cannot be created and created in a short time, must be through the process of coaching conducted from an early age (children). Because in children functional ability can already be seen, especially on the development of big children. Large children are children between the ages of 6 to 10 or 12 years. Physical development of children that occurred during this period showed a different trend compared to the previous or after. The tendency that occurs is the pattern of apathy and growth patterns associated with the proportion of the size of body parts. Physical growth of boys and girls has begun to show tendency increasingly apparent [44]. In children aged 6 to 12 years there has been a development in terms of physical development, the development of biomotor components, including: strength, flexibility, endurance, power and other biomotor capabilities [13]. In addition to physical growth, in children aged 6 to 12 years, has been the process of increasing physiological maturity in each individual. The growth and level of physical and physiological maturity have an impact on the development of physical ability. Physical abilities of children, will affect the development of motion skills or increased exercise skills.

Sports coaching in children aged 6 to 12 years, other than based on physical conditions and some characteristics at a certain age, residential environment factors are also very important in the development of individual motion in exercising. Residential environments such as air temperature, climate, altitude, will have an impact on a person's physiological changes, the environment at which it will affect the physiological adaptation of a person [13]. One of the environmental adaptations can be made in comparison with the differences in partial pressure of oxygen (PO2), both in lowland and mountainous regions [12]. In addition distinguished coastal and mountainous areas in terms of air temperature and oxygen (O2) levels are also different [16]. The higher an area of sea level the oxygen (O2) level is less. Given the differences in partial pressure of oxygen (PO2) found in lowland and mountainous areas, it will also affect the amount of hemoglobin (Hb) in red blood cell granules. Mountainous areas or mountainous areas of oxygen (O2) in the air will decrease. In order for the body to still get rations oxygen (O2), then the propagation tool that is propagated, ie the number of hemoglobin (Hb) in red blood cells will increase. In high areas such as the mountainous areas oxygen (O2) and the pressure is smaller than the coastal areas or lowlands. Hence the need for physiological adaptation or acclimatization for people living in mountainous areas or in mountainous areas, this acclimation has occurred since birth.

Based on the above background, research will be conducted that aims to determine the development of aerobic and anaerobic capacity capability in boys and girls aged 6 to 12 years, influenced by the location of both topography in coastal areas and in mountain areas. Furthermore, it is to find out the comparison of aerobic and anaerobic capacity-building capabilities in boys and girls in the age group of 6 to 12 years, who were born and lived in coastal areas who would then be compared with boys and girls aged 6 to with 12 years, who was born and lived in a mountainous area.

II. MATERIALS AND METHOD

This research is a developmental study with cross sectional method and comparative causal research. Developmental research is "focusing on the variables and their development over several periods [50]. This study investigates the patterns and subsistence of growth and development, and how the variables relate to one another and affect the properties of growth and development ".

The characteristics of developmental research are:

1. Know the development of research subjects within a certain time.
2. Can use longitudinal method and cross sectional method.

The method used in this developmental study is the cross-sectional method which means that the researcher does not defend the research subject to be observed in the long run, but elicits new subjects replacing the old subjects, from various groups age. Long periods of time, replaced with sanding from different age groups.

The characteristics of this method are:

1. The researcher does not need to wait for long term of subject / child, so the research conclusion can be immediately known.
2. Research is able to control other variables because the implementation of short research.
3. A small possibility of losing a research subject.

While comparative causal research aims to investigate the possibility of causal relationships based on observation of the consequences and look for factors that may be the cause through certain data. Comparative causal research is ex post facto is a type of research conducted to examine one type of events that have occurred and then trace backward to determine the factors that can cause the incident [45]. This study uses the same basic logic with experimental research that if x then y, only in this study there is no direct manipulation of independent variables (independent variables) because the phenomenon has occurred.

In addition, this research is known as research model "post-event measurement" (ex post facto) [1]. In this model the researcher does not provide treatment but estimates that one or more variables have been the cause of other variables. The study looked at causal relationships to variables that were seen as causal factors with the resultant variables.

III. RESULTS AND DISCUSSION

The focus area of this research is bima district of West Nusa Tenggara province. There are 18 sub-districts of Bima Regency: Sape Sub-district, Wera Sub-district, Belgo Sub-district, District of Palibelo, Donggo Sub-district, Langgudu Sub-district, Lambu Sub-district, Bolo Subdistrict, Monta Subdistrict, Madapangga Sub-District, Lambitu District, Ambalawi District, studio of tambora sub-district. Sanggar and Tambora sub-districts are the sub-districts located the furthest from the administrative center of Bima regency, where the distance is about 130 km and 250 km respectively. In addition, these two sub-districts are the widest sub-districts in Kabupaten Bima with an area of 720 km2 and 505 km2 respectively. The capital of Donggo Sub-district, located in the village of O'o has a height of about 500 m above sea level. This makes Donggo District the sub-district with the highest altitude above sea level. In revealing the extent of the development process of the district sports bima, then taken 3 districts which became the focus area of research in order to represent the district of bima as a whole. The three sub-districts are meant to be advanced, medium and underdeveloped.

A. Data Description

Data descriptions include Aerobic capacity capability with Harvard Step Up test and Anaerobic capacity capability with Standing Broad Jump test, in boys and girls aged 6 to 12 years living in coastal and mountainous areas.

From the table 1, it can be seen the average aerobic and anaerobic capacity in boys and girls aged 6 to 12 years who live in mountainous areas.

Average aerobic capacity in boys in mountainous areas of age 6 years 19, age 7 years 23, age 8 years 26, age 9 years 39, age 10 years 38, age 11 years 46, and age 12 years 62 Average aerobic capacity in girls in mountainous areas 6 years of age 16, age 7 years 18, age 8 years 22, age 9 years 30, age 10 years 33, age 11 years 42, and age 12 years 62. Average anaerobic capacity in boys in mountainous areas 6 years old 96.4, age 7 years 114.3, age 8 years 127.8, age 9 years141.8, age 10 years 142.8, age 11 years 155.6, and age 12 years 158.1. Average anaerobic capacity in girls in mountainous areas of age 6 years 86.3, age 7 years 100.9, age 8 years 105.7, age 9 years 116.1, age 10 years 119.6, age 11 year 126.4, and age 12 years 128.2. Results of Data Analysis

Table 1. Descriptive Statistical Analysis Results Aerobic And Anaerobic Capacity Test In Ages 6 To 12 Years In The Mountain Region.

No	Mountains				
	age	Average Aerobic Capacity		Average Anaerobic Capacity	
		Man	Women	Man	women
1	6	19	16	96,4	86,3
2	7	23	18	114,3	100,9
3	8	26	22	127,8	105,7
4	9	36	30	141,8	116,1
5	10	38	33	142,8	119,6
6	11	46	42	155,6	126,4
7	12	62	57	158,1	128,2

B. Development of Aerobic Capacity Capability

The Capability Development of Aerobic Capacity In Boys And Girls at Ages 6 To 12 Years Living In Coastal Areas.

Complete below will present the development of aerobic capacity capability using the Harvard Step Up test on boys and girls aged 6 to 12 years living in coastal areas in the form of average yield tables and charts.

Based on the above table average capacity of aerobic capacity of boys in the coastal area level 6 years of age 16, age 7 years 19, age 8 years 21, age 9 years 25, age 10 years 33, age 11 years 41, age 12 year 59. While the average capacity of aerobic capacity of girls in coastal areas of age 6 years 14, age 7 years 15, age 8 years 19, age 9 years 22, age 10 years 26, age 11 years 34, age 12 years 47.

Average aerobic capacity capabilities in boys and girls aged 6 to 12 years living in coastal areas can be described in figure 1.

The graph above shows that the capacity of aerobic capacity in boys and girls aged 6 to 12 years living in the coastal areas is consistent. In children aged 6 years between men increased more than women. In children aged 7 years there is an increase in development that is not too large between men and women. At the age of 8 years there was a slight increase in men while women experienced a high increase. At the age of 9 years there is a large increase in boys and girls. At the age of 10 years there is a large increase in boys compared to women. In children aged 11 years there is a large increase in boys and girls. In children aged 12 years there is a considerable increase in development in boys and girls. The overall average capacity of aerobic capacity in boys living in coastal areas is higher than that of aerobic capacity in girls living in coastal areas.

Table 2. Average Aerobic Capacity of Men And Women On Coastal Coast.

No	Age	Man (Fitness Index)	Women (Fitnes Index)	Difference Progress	Percentage (%)
1	6	16	14	2	7%
2	7	19	15	4	12%
3	8	21	19	2	5%
4	9	25	22	3	6%
5	10	33	26	7	12%
6	11	41	34	7	9%
7	12	59	47	12	11%
Average		31	25	5	9%

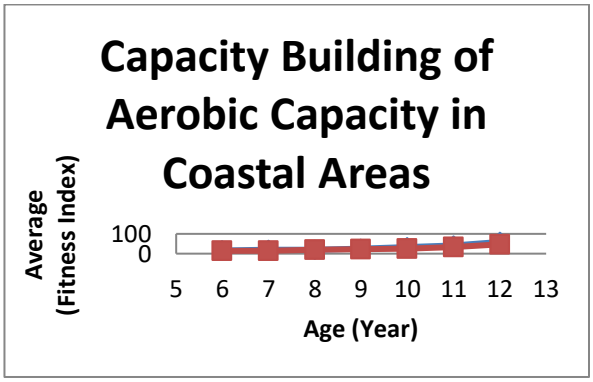

Fig. 1. Aerobic Capacity Capacity Development In Boys And Women Aged 6 To 12 Years Living In Coastal Areas.

C. Comparison of Aerobic Capacity Development Capacity In Boys And Women Aged 6 To 12 Years Living In Coastal Areas and Mountains.

Comparison of Aerobic Capacity Development Capacity In Boys Ages 6 To 12 Years Living In Coastal Areas With Living In The Mountains.

Complete below will be presented the development of aerobic capacity capability using the Harvard Step Up test on boys aged 6 to 12 years living in coastal areas with those living in mountain areas in the form of average yield tables and charts.

Based on the above table average capacity of aerobic capacity of boys in the coastal area level 6 years of age 16, age 7 years 19, age 8 years 21, age 9 years 25, age 10 years 33, age 11 years 41, age 12 year 59. While the average aerobic capacity ability of boys in mountainous areas of age 6 years 19, age 7 years 23, age 8 years 26, age 9 years 36, age 10 years 33, age 11 years 46, age 12 year 62.

Average aerobic capacity capability in boys aged 6 to 12 years living in coastal areas and mountain areas can be described in a graph as follows:

Table 3. Average Aerobic Capacity of Men in Coastal and Mountain Coast.

No	Age	Coastal Coastal Man (Fitness Index)	Mountain Man (Fitness Index)	Difference in Progress	Percentage (%)
1	6	16	19	3	9%
2	7	19	23	4	10%
3	8	21	26	5	11%
4	9	25	36	11	18%
5	10	33	38	5	7%
6	11	41	46	5	6%
7	12	59	62	3	2%
average		31	36	5	9%

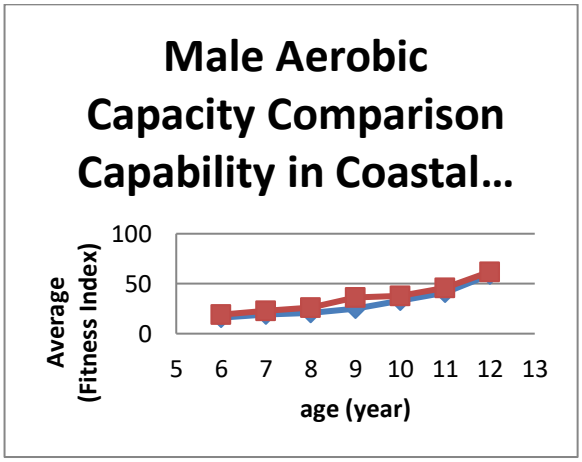

Fig. 2. Aerobic Capacity Development Capabilities In the Boys Age 6 Up To 12 Years Live At Regional and Local Coastal Mountains.

The graph above shows that the ability of aerobic capacity in boys aged 6 to 12 years who live in coastal areas and

mountainous regions experiencing consistent growth. In children aged 6 years the mountains have increased not too large as well as children in coastal areas. In children aged 7 years the mountain area has increased not too big as well as coastal areas. In children aged 8 years there is an increase that is not too large as well as children coastal areas. In 9-year-old children, mountainous areas have a large increase whereas coastal children are experiencing not too large increase. At the age of 10 years the mountainous area is not too big increase, while the coastal children have a great increase. In 11-year-old children, mountainous areas have a large increase as well as in coastal children. In 12-year-old children, mountainous areas have increased considerable development as well as coastal children. The average overall ability of aerobic capacity in boys who live in the mountainous regions is higher than on the ability of aerobic capacity in boys who live in coastal areas.

D. The Development of Anaerobic Capacity

The Development of Anaerobic Capacity In Boys And Women Aged 6 To 12 Years Living In Coastal Areas.

Table 4. Average Capability Anaerobic Capacity Men And Women In Daytona Beach.

No	Age	Man (cm)	Women (Cm)	Difference in Progress	Percentage (%)
1	6	93,2	85,8	7,4	4%
2	7	95,1	88,6	6,5	4%
3	8	117,2	98	19,2	9%
4	9	133	105,8	27,2	11%
5	10	138,6	110	28,6	12%
6	11	139,1	121,1	18	7%
7	12	141,7	123	18,7	7%
Average		123	105	18	8%

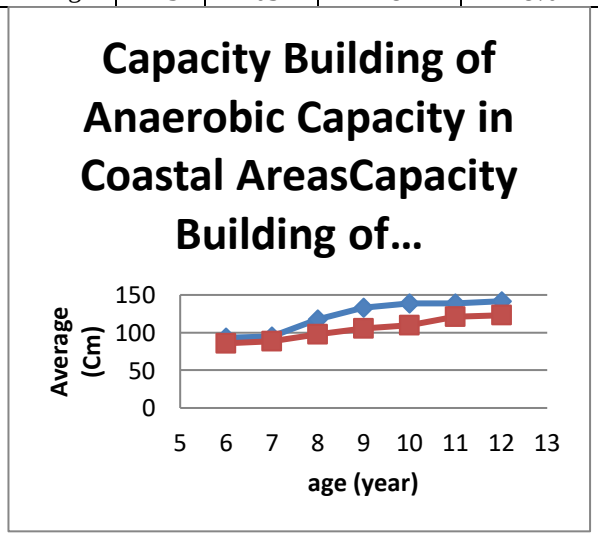

Fig. 3. The Development of Anaerobic Capacity Capacity In Boys And Women Aged 6 To 12 Years Living In Coastal Areas.

Complete below will present an anaerobic capacity building capability using the Standing Broad Jump test on boys and girls aged 6 to 12 years living in coastal areas in the form of average yield tables and charts.

Based on the above table the average anaerobic capacity ability of boys in the coastal area of 6 years age 93.2, age 7 years 95.1, age 8 years 117.2, age 9 years 135, age 10 years 138.6 , age 11 years 139.1, age 12 years 141.7. While the average capacity of anaerobic capacity of girls in coastal areas of 6 years age 85.8, age 7 years 88.6, age 8 years 98, age 9 years 105.8, age 10 years 110, age 11 years 121, age 12 years 123.

The chart above shows that anaerobic capacity abilities in boys and girls aged 6 to 12 years living in coastal areas are consistent. In children aged 6 years men have increased more than women. In children aged 7 years there is an increase in development that is not too large between men and women. At the age of 8 years there is a high increase in men while women experience a not too high increase. At the age of 9 years there is a large increase in boys and girls. At the age of 10 years there is a large increase in boys compared to women. In children aged 11 years there is a small increase in boys and girls experienced a high increase. In children aged 12 years there is an increase in small development in boys and girls. The overall mean capacity of anaerobic capacity in boys living in coastal areas is higher than in anaerobic capacity abilities in girls living in coastal areas.

E. Comparison of Capacity Development of Anaerobic Capacity In Boys And Women Age 6 Up To 12 Years Living In Coastal Areas Of The Coast And Mountains.

Comparison of Capacity Development of Anaerobic Capacity In Boys Ages 6 To 12 Years Living In Coastal Areas With Living In The Mountains.

Complete below will present an anaerobic capacity building capability using the Standing Broad Jump test in boys aged 6 to 12 years living in coastal areas with those living in mountain areas in the form of average yield tables and graphs.

Table 5. Average Capability of Anaerobic Capacity of Men in Coastal and Mountain Coast.

No	Age	Beach Man (Cm)	Mountain Man (Cm)	Difference Development	Percentage (%)
1	6	93,2	96,4	3,2	2%
2	7	95,1	114,3	19,2	9%
3	8	117,2	127,8	10,6	4%
4	9	133	141,8	8,8	3%
5	10	138,6	142,8	4,2	1%
6	11	139,1	155,6	16,5	6%
7	12	141,7	158,1	16,4	5%
Average		123	134	11	4%

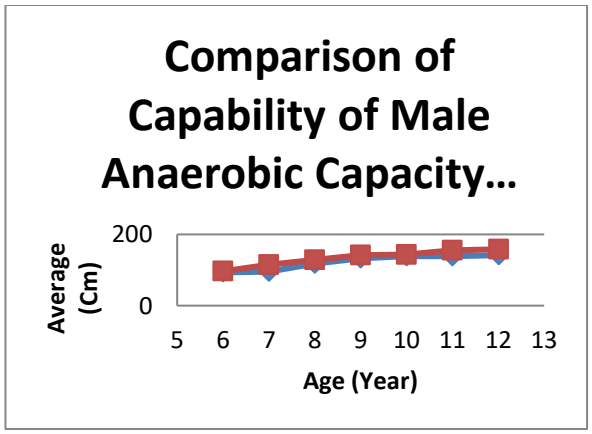

Fig. 4. The Development of Anaerobic Capacity Capacity in Boys Ages 6 to 12 Years Living In Coastal Areas And Mountains.

Based on the above table the average anaerobic capacity capability of boys in the coastal area of 6 years 93,2, age 7 years 95.1, age 8 years 117.2, age 9 years 133, age 10 years 138.6 , age 11 years 139.1, age 12 years 141.7. While the average anaerobic capacity of boys in the mountains was 6 years old 96.4, age 7 years 114.3, age 8 years 127.8, age 9 years 141.8, age 10 years 142.8, age 11 years 155.6, age 12 years 158.1.

The average anaerobic capacity capability of boys aged 6 to 12 years living in coastal and mountainous areas can be described in a graph as follows:

The graph above shows that anaerobic capacity abilities in boys aged 6 to 12 years living in coastal and mountainous areas have consistent progress. In children aged 6 years the mountains have increased not too large as well as children in coastal areas. In children aged 7 years, mountainous areas have a large increase whereas coastal areas have a small increase. In children aged 8 years there is a large increase as well as children of coastal areas have increased greatly. In 9-year-old children, mountainous areas have a large increase as children of coastal areas have increased considerably. At the age of 10 years, the mountainous area is not too big, so the coastal children have a small increase. In 11-year-old children, mountainous areas have a large increase whereas in coastal children have a small increase. In 12-year-old children, mountainous areas have increased small development as well as coastal children. The overall average capacity of anaerobic capacity in boys living in mountainous areas is higher than in anaerobic capacity capacity for boys living in the coastal areas.

IV. CONCLUSION

Based on the results of research and discussion that have been described in the previous chapter it can be drawn some conclusions as follows:

A. Aerobic Capacity Capacity of Ages 6 to 12 Years in Coastal Areas and Mountains Areas.

The development of aerobic capacity capability in boys and girls aged 6 to 12 years living in the coastal areas.

The development of aerobic capacity capability of boys and girls aged 6 to 12 years living in the coastal areas has increased quite steadily in each year. The average capacity of aerobic capacity in boys living in coastal areas is higher than that of aerobic capacity in girls living in coastal areas.

The development of aerobic capacity capability in boys and girls aged 6 to 12 years living in mountain areas.

The development of aerobic capacity capability of boys and girls aged 6 to 12 years living in mountainous regions has increased quite steadily in each year. The average aerobic capacity capability of boys living in mountainous areas is higher than that of aerobic capacity in girls living in mountainous areas.

Comparison of aerobic capacity-building capabilities of boys and girls at 6 to 12 years living in coastal areas with those living in mountain areas.

Capacity of aerobic capacity in boys aged 6 to 12 years living in coastal and mountainous areas has consistent progress. The average aerobic capacity capability of boys living in mountainous areas is higher than that of aerobic capacity in boys living in coastal areas. Capacity of aerobic capacity in girls aged 6 to 12 years living in coastal and mountainous areas has consistent progress. The average capacity of aerobic capacity in girls living in mountainous areas is higher than that of aerobic capacity in girls living in coastal areas.

B. Capacity Building of Anaerobic Capacity of Ages 6 to 12 Years in Coastal Areas of Coastal and Mountain Areas.

The development of anaerobic capacity abilities in boys and girls aged 6 to 12 years living in the coastal areas.

The development of anaerobic capacity capability of children aged 6 to 12 years living in the coastal areas has increased quite steadily in each year. The mean anaerobic capacity capability of boys living in coastal areas is higher than the anaerobic capacity capability of girls living in the coastal areas.

The development of anaerobic capacity capability in boys and girls aged 6 to 12 years living in mountainous areas.

The development of anaerobic capacity capability of children aged 6 to 12 years who live in mountainous areas has increased quite steadily in each year. The mean anaerobic capacity capability of boys living in mountainous areas is higher than the anaerobic capacity capability of girls living in mountainous areas.

Comparison of anaerobic capability of boys and girls at the age of 6 to 12 years living in the coastal areas with those living in mountainous areas.

Anaerobic capacity abilities in boys aged 6 to 12 years living in coastal and mountainous areas have consistent progress. The mean anaerobic capacity capability of boys living in mountainous areas is higher than the anaerobic capacity capability of boys living in the coastal areas. Anaerobic capacity abilities in girls aged 6 to 12 years living in coastal and mountainous areas are consistent. The mean anaerobic capacity capability of girls living in mountainous areas is higher than the anaerobic capacity capability of girls living in the coastal areas.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

Personality Characteristics in Individual and Team Sports

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***Abstract*—This study compares the personality characteristics of athletes in individual and team sports. 197 athletes (105 individual, 92 team, 131 males, and 66 females) completed the SPQ-20 Sport Personality Questionnaire. This questionnaire is composed of four sub- scales of 20 personality traits. The data were collected by Sport Personality Questionnaire 20 (SPQ-20) and the statistical analysis was performed with SPSS software. In order to describe the data, the description used to compare the average is the t-test. The results revealed that individual sport athletes scored significantly higher only on flow than team sport athletes. The team sport athletes scored significantly higher on conscientiousness, self-awareness, and ethics than what the individual sport athletes did. No significant difference was found between two groups on achievement, adaptability, competitiveness, visualization, intuition, goal setting, pressure management, self-efficacy, failure fear control, stress management, emotions, self-talk, empathy, relationships, aggressiveness, and impression management. It can be concluded that the personality characteristics of athletes are different between individual and team sports.**

Keywords— personality characteristics, athletes, sports

I. INTRODUCTION

Personality is a determinant of achievement for sport, and is reliable for individuals who can help suit certain types of sports [1]. The research in the psychological aspects show that there are personality differences between individual and team sport has been study by many researchers. The differences between team and individual sport athletes are significantly higher on sociotropy and autonomy [2]. Another study revealed that individual sport athletes scored significantly higher on conscientiousness and autonomy than did team sport athletes. The team sport athletes scored significantly higher on agreeableness and sociotropy than did the individual sport athletes [3].

Along with this, Singer says that based on observations made on baseball athletes and tennis athletes, there were differences in personality aspects of team sport with individual sports athletes [4]. According to Williams & Reilly (2000) based on the results of the study of the sport of football there are some psychological characteristics that need to be possessed by young athletes, namely control of the level of arousal, high confidence, focus on high tasks and the capacity to perform fully spirit [5].

Literature studies show an effect on success. A very important translation of his long achievements in sports and identification. Furthermore, the amount of personality is due to genetic and environmental integration [1]. With regard to research on the topic, the existence of a competitive athlete's personality characteristics has been controversy among researchers. Vealey (2002) has confirmed the absence of personality profiles for athletes, once there is no difference that can be distinguished between athletes and non-athletes [6].

Vanden Auweele, Nys, Rzewnicki, & Van Mele, (2001) reported that are no different from non-athletes with regard to extroversion in three different apparatus (16 PF, EPI and EPQ), becoming a strong results for personality research [7].

Unlike the authors mentioned above, Karimi & Besharat [2], Singer,et al [4]. Reported that the team sports presents some psychological characteristics that distinguish him from individual sports. Among these differences, the authors consider that individual sport athletes scored significantly higher on conscientiousness and autonomy than did team sport athletes. The team sport athletes scored significantly higher on agreeableness and sociotropy than did the individual sport athletes. No significant difference was found between the two groups on neuroticism, extraversion and openness. It can be concluded that athletes' personality characteristics are different in individual and team sports [2, 4].

Some studies have shown the positive effect of sport on personality, on the contrary some have shown no positive effect of sport on personality. Some believe that team athletes are more extraversion, with higher anxiety and dependency, on the contrary individual athletes are more introspection and with higher self-confidence. Then the study of athletes' personality characteristics, either individual or team sport athletes provide an opportunity for sport counselor, coaches and specialists to discover and select the talented ones for guiding them to the highest level of skills.

The main purpose of the present study is to survey and diagnose athletes' personality characteristics in individual and team sports and to compare their personality characteristics with each other. The component of personality including 20 indicators: achievement; adaptability; competitiveness; conscientiousness; visualization; intuition; goal setting; managing pressure; self-efficacy; fear of failure control; flow; stress management; emotions; self-talk; self-awareness; ethics;

empathy; relationships; power; aggressiveness; and impression management.

II. METHODOLOGY

The method used in this research is survey method with ex post facto research design. This is used to determine the psychological condition of athletes PPLOP Central Java. A total of 197 athletes (105 individual, 92 team, 131 males, and 66 females) from individual sports (taekwondo, swimming, pencak silat, wushu, boxing, lifting, wrestling, karate, track and field, judo, archery, table tennis, climbing, and roller skaters) and team sports (football, canoeing, volley ball, basketball, and sepak takraw) composed the sample. All individuals were informed about the objectives of the research and that data would only be used for research purposes and generally analyzed, and they signed a consent form to participate in this study. Samples obtained from athletes who are at the Central Training Center for Student Sport (PPLOP) of Central Java province.

The instrument used was the reviewed Indonesian version of the Sport Personality Questionnaires (SPQ-20) (myskillprofile.com) containing 168 questions with response possibilities statement describes their behavior using a 5-point likert Scale (never/almost never, occasionally, fairly often, very often and always/almost always), and being applied just once, and also have 0,6 to 0,8 scale reliabilities [8]. The SPQ20 assesses 20 dimensions of mental toughness covering 4 key areas: confidence and resilience, achievement drive and competitiveness, power and aggressiveness, and interaction and sportsmanship.

Procedure Questionnaires were administered to subjects within 15-20 minutes and the nature of study was described at the top of the questionnaire to the subjects. Each question item took approximately 30 second to complete. Subjects who had completed the personal information section represented that they had given their consent to provide the data under the condition of anonymity. Investigator collected the questionnaires from each coach after completing the questionnaire. A total of 197 questionnaires were collected.

For the analysis of the personality characteristics comparison between individual and team sports, the descriptive analysis was initially used (average and standard deviation) for the behavior of each variable to be studied. In order to describe the data and differences the t-test was used. At the significance level of 0.05 was used in order to determine the differences between study groups. The statistical program used was the SPSS version 19.0.

III. RESULT AND DISCUSSION

A. Socio-demographic characteristics

The socio-demographic sample is shown in Table 1, ie: the total number of samples of 197 athletes (105 individual, 92 team, 131 males, and 66 females) from individual sports (taekwondo, swimming, pencak silat, wushu, boxing, lifting, wrestling, karate, track and field, judo, archery, table tennis, climbing, and roller skaters) and team sports (football, canoeing, volley ball, basketball, and sepak takraw)

TABLE I. : GENERAL CHARACTERISTICS OF THE SAMPLE (N=197)

	Individual	Team	Total
n(Men)	63	68	131
n(Female)	42	24	66
n(Total)	105	92	197

B. The differences between individual and team sport

Can be seen in table 2 there are not many differences in each group based on the average score. The variables that most differed in the averages were: Conscientiousness (3,67 and 3,93 points); Flow (3,63 and 3,39 points); Self-awareness (3,46 and 3,68); Ethics (3,54 and 3,92) and Power (2,58 and 2,88). While, the variables that show smallest differences were: Goal setting (3,33 and 3,33 points); Stress management (3,50 and 3,46 points) and Relationship (3,16 and 3,21points).

In order to verify these differences statistically, the Student's t-test was applied (table 2) and the sample of individual sport was significantly distinguished from team sports ($p < 0.05$) in five out of 21 variables of the SPQ20 instrument: Conscientiousness, Flow, Self-awareness, Ethics and Power.

TABLE II. : AVERAGE AND STANDARD DEVIATION OF PERSONALITY VARIABLES OF INDIVIDUAL AND TEAM SPORTS

Variable	Individual		Team		"*t*"	P
	X	SD	X	SD		
Achievement	3,31	0,56	3,46	0,77	-1,629	0,105
Adaptability	3,49	0,72	3,71	1,48	-1,406	0,161
Competitiveness	3,78	0,73	3,93	0,79	-1,454	0,148
Conscientiousness	**3,67**	**0,77**	**3,93**	**0,86**	**-2,264**	**0,025**
Visualization	3,63	0,62	3,72	0,82	-0,990	0,324
Intuition	3,03	0,58	3,15	0,82	-1,154	0,250
Goal Setting	3,33	0,51	3,33	0,84	-0,097	0,923
Managing Pressure	3,11	0,60	3,00	0,69	1,084	0,280
Self-Efficacy	3,44	0,57	3,32	0,73	1,185	0,237
Fear of Failure Control	3,13	0,74	3,23	0,90	-0,867	0,387
Flow	**3,63**	**0,57**	**3,39**	**0,84**	**2,282**	**0,024**
Stress Management	3,50	0,53	3,46	0,81	0,367	0,714
Emotions	3,23	0,60	3,42	1,19	-1,485	0,139
Self-Talk	3,61	0,66	3,76	0,93	-1,300	0,195
Self-Awareness	**3,46**	**0,62**	**3,68**	**0,87**	**-2,131**	**0,034**
Ethics	**3,54**	**0,60**	**3,92**	**1,20**	**-2,875**	**0,004**
Empathy	3,14	0,61	3,32	1,33	-1,291	0,198
Relationships	3,16	0,45	3,21	0,69	-0,685	0,494
Power	**2,58**	**0,65**	**2,88**	**0,86**	**-2,770**	**0,006**
Aggressiveness	2,77	0,74	2,94	0,86	-1,483	0,140
Impression Management	3,24	0,71	3,41	0,91	-1,497	0,136

Based on these differences, individual sports showed higher significant point ($p < 0,05$) only on variable Flow and lower in

variables Conscientiousness, Self-awareness, Ethics and Power. In other hand, team sports presented higher significant point in variables Conscientiousness, Self-awareness, Ethics and Power and lower only on variable Flow. These data characterize individual sports with team sports in the point of view of personal relationships.

The data obtained in this study are not agreement with findings of Widyaningsih et al. (2018); Zourmand and Changzhu (2017) who verified that individual sports has been higher on variable achievement, conscientiousness, visualization, self-efficacy, self-talk, self-awareness, and ethics. Thus, team sport higher on the variable goal setting, imagery and self-talk [9, 10].

Environmental factors have an influence that makes a person similar to others because of the various experiences that he experienced. Environmental factors consist of cultural factors, social class, family, peers, and situations. Among the environmental factors that have a significant influence on personality are individual experiences as a result of a particular culture. Each culture has its own rules and sanction patterns of learned behavior, rituals and beliefs. This means that each member of a culture will have certain common personality characteristics [6, 11, 13].

Comparing with other studies conducted by Nia and Ali Besharat (2010); Eagleton, McKelvie, and De Man (2007), who investigated and compared individual and team sports, the data found in the present study corroborate the fact that individual sports more achieve and control emotion with other [14, 15]. There are also differences with data obtained by Auweele et all (2001) and Morgan and Costill (1996) for variable Achievement, Competitiveness, Empathy, Relation, Strength and Aggressiveness that presented no significant variations, while for the mentioned authors, team sports athletes were characterized by being more extroverted and by the fact that athletes presented lower stress level, which contrasted with data found in the present study [7, 16, 17].

It should be underlined the inconsistency of results and conclusions in the comparison of athlete personality in each sport, generated by various studies conducted so far, caused by various ahs. The reason for this is that there are differences in the research instruments used (EPQ, 16 PF, FPI, POMS, EPI, and now SPQ20) that measure different variables and personality components and there can be no significant comparison between instruments. The number of intervened variables (social, educational, cultural and economic) can affect the differences and inconsistencies in the results obtained.

Although the results of this study proved inconsistent, the limitations in this study need to be understood. One limiting factor is that the sample used is the PPLOP athlete of Central Java and limited and it is important to note that the number of athletes in the school is very limited. Thus, the differences found between the groups should be understood.

In this case, the samples of athletes selected for this study do not represent the overall population of athletes in Indonesia, as there are some age ranges, social classes, cultures, ethnicities, races, educational levels that make generalization of data difficult. Therefore, the results obtained should be considered an indication of the possible differences between athletes in each sporting population, but in order for the results of this study to show a constant result in the entire population, further research should be conducted with a wider object.

Other limitation of the present study is the lack of knowledge of researches on the personality of PPLOP Central Java, Indonesia athletes performed with the SPQ-20. This argument makes it difficult to discuss variables that are compared with the personality dimension in other instrument personality. This aspect can be regarded as a limiting factor for personality studies, after discovering characteristics that identify specific study groups becomes increasingly difficult.

IV. CONCLUSIONS

The goal of this research is to compare the personality characteristics of individual and team sports, and also present results contrary to the findings of previous research. However, it is clearly concluded that athletes are significantly different in the variables studied. People can run out of the results found, there are athletes in various sports is always different because each has different characteristics and possibilities from the social, geographic and culture. This verification demonstrates comprehensive data consistency and indicates the possible generalization of differences between individuals of both groups; the facts are worth investigating further.

In order to characterize high-level athletes personality can be studied and understood better, and for the development of better knowledge in this field, several studies on the following topics are suggested:

- Longitudinal studies that allow an evaluation of athlete personality development from the first year to high degree are achieved;
- To compare athletes from different performance levels with different non-athlete samples for better differentiation formations where the extracts appear more clearly.

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Effect of Fartlek Training to the Improvement of VO2Max on runner atheletes of 800-meters

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***Abstract*—The research has aimed the improvement of vo2max on 800-meters runner of Banjarmasin Athletic with fartlek training. The problem in this study, the athletes did not experience a significant increase especially in endurance during exercise, reality on the field, during training many experience exhaustion is too fast when running the program provided by the coach, and I also hope that I examine the Vo2Max athlete in order to have the initiative of trainers to check the endurance or Vo2Max athletes trained to get the most out of practice and compete later. The research method used is the pre-experiment method. The population in this research was all of Banjarmasin Athletic numbered seven people by using Purposive sampling technique. From the researchers' analysis of this study that there is a need for variations of exercise appropriate to the athlete's characteristics in Banjarmasin, by providing fartlek training for increasing vo2max based on some of the results of the journal as the primary basis in conducting this research. The conclusion of the research is that by giving fartlek exercise with eight weeks can increase vo2max athletes significantly at athletes runners of 800 meters in Banjarmasin, South Kalimantan.**

Keywords— Fartlek training, Vo2max, and 800-meters runner

I. INTRODUCTION

The peak of achievement To achieve a running achievement in athletic sports an athlete must have the physical, technique, tactics, mental, maturity champion and many other factors that the athlete must have to achieve achievement. In one physical must have several elements, namely: strength, endurance, speed, flexibility, and agility. "there are four kinds of completeness that need to be possessed if one will achieve an optimal achievement that includes: 1) Physical Build-Up, 2) Technical Build-Up, 3) Mental Build-Up and 4) Maturity champion "[1]. One of the factors that need to be known immediately is the level of an athlete's physical fitness can be regarded as a condition that gives characteristics about the degree or level of a person's ability to perform activities, whether the activities in practice or during the game.

As a runner must be able to feel the whole how the state of physical fitness has. Thus if the athlete's fitness is in excellent classification, then anything programmed by the trainer can be completely done without any obstacles, so the program created by the trainer will be accomplished by the desired objectives. There are several numbers that are competed in the athletic branch especially on the run number, ie, short distance, medium distance and long distance. At the middle distance is divided into two 800 meters and 1500 meters. While the author carefully specializes only on 800 meters, so that should be supported by the runner of 800 meters including endurance, speed, and strength. Based on observations in the field while the researchers, in fact after observing the exercise results show there are still many who have less VO2Max and have not mastered how to extend the step and accelerate the hand swing, which is part of the technique that must be mastered properly by runners. A coach can not yet know the VO2Max athletes being coached, it is because they lack good endurance, when running athletes experience rapid fatigue so that to improve the ability to achieve achievement so hampered.

In addition, other problems are found in facilities that are less supportive or sufficient for athletes to run in training and trajectory in Banjarmasin that has not been national level, with the lack of knowledge of a trainer to the exercise program. Currently there is no data about the effect of fartlek exercise on VO2Max increase runners 800 meters athletic athletics Banjarmasin. Therefore the researchers conducted fartlek exercise efforts to increase endurance that is still less owned by athletes run Banjarmasin, especially on runners 800 meters. This method is done in preparation long before the game. Seeing the situation in the field the main source of lack of endurance is the program is not programmed training provided by the coach, which is because the training program is given less precise and does not vary. Therefore an athlete will have difficulty in every practice and even compete.

Then it will all support the technical ability, as well as the mental runner in the match. In addition to achieving these objectives must be balanced with adequate facilities and the full support of the organization, the source of funds, as well as the support of family, friends, community and an athlete will be better if it has the ideal height to support the steps it

achieves on When running athletes in the area of Banjarmasin still not get the proper training program from the trainer, the average of athletes run Banjarmasin, especially the number of medium-range running 800-meters received a training that took off from the coach so that the athletes did not experience a significant increase especially in the physical condition or endurance, as expected especially in improving VO2Max, plays an important role to support the endurance and stamina of the 800-meter runner Banjarmasin.

From some other researchers that fat-leek exercise can improve aerobic endurance as it is discovered that the fartlek exercises have a significant impact on the increase of Vo2Max [2]. fatrlek exercise can improve endurance [2]. The fartlek can increase the endurance of an athlete. Based on the results of such research as the fundamental theory using fartlek exercise [3]. Basically every runner must have good VO2Max or pulmonary heart resistance to face the race and especially in doing his daily practice. Do fartlek exercises or endurance exercises on your own. In this study, researchers tried to do fartlek exercise treatment. Researchers provide treatment in the form of fartlek exercise in giving the treatment the researchers gave the exercise concerning the principle-practice, and develop a clear exercise program and correct. The purpose of the exercise is to improve VO2Max, using the existing field facilities in Banjarmasin, as well as the strong will from within the athlete and the motivation of the researcher as the direct trainer of each athlete

II. Materials And Method

The method used in this research is pre-experimental design. The research design used pretest and posttest in one group [5]. The population in this research was all athlete of 800-meters runners who amounted to 7 people and all of them become sample. Sampling technique using the total sample, data collection using Balke test. After the data collected in the pretest and the posttest, then the data were analyzed using T-Test by comparing t-count with t-table, the end of the research conclusions can be concluded.

III. Results and Discussion

Results of the data pretest and posttest used Balke test.

TABLE I. The Data Pretest and Posttest

Sample	Pretest	Posttest
1	49,25	54,7
2	47,16	50,48
3	42,56	47,2
4	42,55	47,6
5	42,54	46,87
6	37,76	40,49
7	33,11	35,99
Average	42,13	46,19

The results showed the fartlek training could increase VO2Max at runners 800-meters athletic athletics Banjarmasin. In the initial test, an increase of VO2Max runner 800-meters athletic athlete Banjarmasin with average initial test VO2Max = 42.13 ml/g/min. After being treated fartlek exercise, then the results VO2Max runners 800 meters athletics athletes Banjarmasin increased by an average of 46, 19 ml/g/min. Can be seen an increase in the figure diagram:

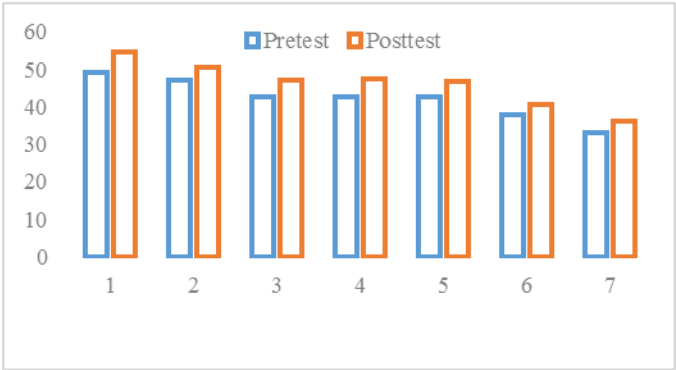

Fig. 1. Increase the Data Pretest and Posttest

Results after treatment were given three times per week for six weeks that had a significant effect on the VO2Max increase in the runner. The 800-meter runner's VO2Max increase as a result of treatment with exercises that lead to the progress of runners in improving the VO2Max provided by the trainer. Through these exercises, the athlete runs to understand the principles of proper practice so as not to experience any errors in the exercise that result in overtraining that harms the runner himself.

At the time given the treatment of sample fartlek exercises run well, so do not get too many obstacles. Samples diligently to follow the exercises with encouragement each time carry out the exercise up to 18 times the meeting, and the sample on the final test is still seven people. My reason for researching a VO2Max runner 800 meters athletic athlete Banjarmasin because I see the reality on the field, during training many experience exhaustion is too fast when running the program provided by the coach, and I also hope that I examine the vo2Max athlete in order to have the initiative of trainers to check the endurance or VO2Max athletes trained to get the most out of practice and compete later. If the long time for the treatment of this exercise the increase will be higher, but due to limitations and costs are not possible given the longer treatment, researchers who can only examine up here.

In this research used fartlek exercises with various variations such as: run slow, then short sprints, and followed with a moderate run (long stretch). The speed when running is arranged according to the character of each athlete and when the athlete has started to feel tired can break by walking. This pattern of exercise is like playing with this speed so that making fartlek exercises can increase endurance athletes. Discussion about fartlek exercise also based on previous research that is: the fartlek exercises provide there a significant effect on endurance between group control and group experiments between physical education students from fartlek training [6]. The fartlek training proved to be effective in enhancing endurance for runners athletes [7]. The farlek training programme significantly improved maximum oxygen

consumption and resting pulse rate [8]. study results agree with the effectiveness of a 30 s all-out training program with a reduced time commitment for anthropometric, aerobic and anaerobic adaptation and eliminate doubts about its safety as a model [9]. Researchers believe with the results of data obtained in this study if the treatment is longer then it will achieve satisfactory results in forming excellent physical, athletic athletes, especially runners 800-meters.

IV. CONCLUSIONS

Based on the results of data analysis and discussion that have been put forward can be concluded that there is an Effect of Fartlek Training to Improvement of VO2Max on 800-meters runner of Banjarmasin Athletic.

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The Influences of Gymnastics and Motivation Toward The Reduction in Body Fat Level

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***Abstract*— The purpose of the study is to know the influences of Zumba towards the fat level reduction in body. This research was done at Studio Gymnast 88 for 12 weeks. The types of the study are quantitative research, experimental method, and 2x2 factorial designs. The research shows that there is a significant difference between zumba and body gym to reduce body fat level, a significant reduction in body fat level between high and low motivation, and influence of motivation in the training exercise.**

Keywords—gymnastic, motivation, body fat level

I. INTRODUCTION

Sport has become a social phenomenon spread all over the world. In fact, the excessive fat is not due to over eating but there is also a fairly complex fabric, among others: genetic factors, never exercise, daily eating habits, hormones, and sex [22]. The excess energy is stored under the skin called the fat. When it is accumulated high, the human will become fat.

When the total amount of fat in body enlarge, the human will be overweight. One way to cope with weight gain and body fat due to unbalanced calories, an effective program to control is to determine the balance between incoming energy and outgrown energy [2]. According to Sumosardjono in 2000, a sports fitness expert explains how to overcome obesity in the best healthy is to set the diet along with exercise in the form of a combination of weight training and aerobics. body fat levels can be said as a comparison between fatty tissue in the body with fat-free body components [23]. This gymnast is useful to lower body fat levels, train cardiorespiratori, muscle strength, endurance, flexibility and balance and this gymnastics can be done by various age groups.

The advantage of doing exercises on weight loss programs is to reduce fat but also can form muscle tissue, and the results will look better at the desired body weight (Sumosardjuno, 2000). From statistics, women who never exercise in their 30s, the fat is about 33%, and at 60 years the fat becomes 42%. Measure the body fat level can be done by using some ways; *underwater weighing*, *sum of skinfold*, and *bioelectric impendance*.

The measurement which is done by these methods will show the body mass, the percentage of the fat body and body without the fat.

A motivation is a power in oneself that is very important to reach the goals. Motivation as an internal state of the organism that encourages to do something in this sense motivation means the power supplier to behave in a direction.

The variables of the study involves three variables; independent variables of zumba gymnastics and body language gymnastic, attribute variable that is high motivation and low motivation, and dependent variable that is reduction in body fat level. This research was done at Studio Gymnast 88, Patimura Street, Ungaran for 12 weeks. The study uses experimental method, and 2x2 factorial designs. The study population is the productive age mothers of studio 88. The sample of the study is 40 people taken by purposive random sampling technique.

A. Research Objectives

In accordance with the above problem formulation then, the purpose of this research is to know:

1. Differences in the influence of gymnastics zumba and gymnastics body language on the reduction in body fat levels in women of productive age Member of gymnastics 88 Ungaran Semarang District.
2. Differences in body fat loss between high motivation and low motivation in mothers of productive age Member of gymnastics 88 Ungaran Semarang District.
3. There is influence of interaction between gymnastics and motivation to reduction of body fat level at productive age mother Member of gymnastics 88 Ungaran Semarang District.

B. Research Benefits

The results of this study are expected to have the following benefits:

1. Provide information for fitness centers (gymnastics centers) and references for enthusiasts of zumba gymnastics and gymnastics body language for reduction of body fat levels, that exercise and motivation can lower body fat levels.
2. Contributing to the treasures of science for the general public and women in particular, that zumba gymnastics and body language gymnastics can be used as a way to reduce body fat levels.

C. Theoretical Review

Body Fat Levels and Measurements

Fats are a group of organic bonds composed of Carbon (C), Hydrogen (H) and Oxygen (O2) elements, which have a soluble property in certain solvent-solvent fatty substances) such as petroleum benzene, ether. Fatty tissue contains triglycerides, phospholipids, and cholesterol, each gram contains quite a lot of calories. Actually fat is very beneficial for the human body, fat serves as:

1. Essential components of cell membrane and nerve fibers,
2. It is the main source of energy, where fat provides about 70% of our total energy when in a state of rest,
3. Internal organs supported and wrapped by fat so protected,
4. All steroid hormones are produced from cholesterol, where fat contains the cholesterol,
5. Fat-soluble vitamins can enter the body and are transported throughout the body due to fat,
6. Keeping body heat steady (Larry, Jack and David, 2012).

During this time to measure body fat as a mirror obesity is often used method of body mass index (BMI), by dividing the value of body weight (kg) with height (in meters squared). If the result is> 25, it means the body is overweight or obese.

Gymnastics

Zumba Gymnastics

Zumba is one of gymnastic classes that has movement and music that come from Roman tradition. During doing the gymnastics we will do some movements that get inspiration from salsa, merengue, mambo, reggaeton, tango, chachacha and hip-hop movement [2]. Zumba is one of the most popular gyms around the world, zumba was created in 2001 and then developed, since 2012 zumba became a worldwide trend, and this gym is used more than 185 countries in various parts of the world, zumba is one aerobic gymnastics accompanied by music The thick latin is combined with the salsa, regge, cha-cha, belly dance, flamenco, hip-hop, tango and samba rhythms.

Body language Gymnastics

Body Language is a combination of several types of exercises that already exist, including forming gymnastics, postnatal gymnastics, jazz base, and ballet. Body Language that prioritizes the movements for flexibility and muscle formation of the body, concentration on the waist and hip. When this exercise is done correctly and appropriately, it can produce a beautiful body shape with good flexibility, in addition to maintaining stamina.

Motivation

Motivation is a power within a person that is very important in achieving goals, motivation as an internal state of the organism that encourages to do something in this sense motivation means the power supplier to behave in a direction.

II. MATERIALS AND METHODS

This research used quantitative research. It used field experimental method with 2x2 factorial designs. The variables of the study involves three variables; independent variables, attribute variable, and dependent variable. Details as follows: (1) Independent variable is zumba gymnastics and body language gymnastic, (2) Attribute variable is high motivation and low motivation, (3) and Dependent variable is the reduction in body fat level. All of the data that is needed can be obtained from measuring the motivation and the reduction in body fat level by using *skinfold calipers*. The field experimental method is a method that seeks cause-effect factors, controls events in the interaction of variables and predicts the results to some extent (Winarno S., 1989). This research explained the Influence of Gymnastics and Motivation Against Reduction Body fat level (Study Experiments Zumba gymnastics with Gymnastics body language In the Early Age Productive Mothers members of Gym Studio 88 Ungaran, Semarang).

A. Place and Time of Researcher

The study was conducted at Studio 88 Ungaran, Semarang. The timing of the study is from 1 August 2016 to 17 October 2016 (Twelve weeks).

B. Population and Sample

Population is the whole object that become the research attention and the place to generalise research findings (Sandjaja, 2006). The populations in this study were mothers of productive age, which amounted to 55 people. Sample is the part of the population that want to be researched. In this study, the sample is the mother of studio gymnastics members who are productive age, which is 40 mothers from the population number used as a sample. 40 mothers divided into two different treatment groups that are divided according to the motivation that includes 20 low-motivated mothers trained with body language gymnastics and 20 highly motivated mothers trained with zumba exercises. While, 10 other mothers selected randomly. The 40 samples of these mothers also fit into Arikunto's statement in 1996, for experimental research, the sample size is greater than thirty is a large sample. This means that with a large sample of 40 people is quite representative (representative) for the population in this study.

C. Techniques of Collecting Data

Data collection techniques in this study are by measurement of Motivation and reduction of body fat levels. In preparation for the implementation of the research and data analysis, all the measurement data of the required reduction in body fat level was collected by measuring using *skinfold caliper* [6], as follows:

1. Measure the amount of fat present in the waist (Suprailliaca), by calculating body fat levels. Measuring the body fat level by using this method, we have to know about body *density* and water *density*. We also have to watch the water temperatures that affect the water density. Bellow is the table that explains the comparison between the water temperatures and its density:

TABLE 1. The comparison between water temperatures and the density of water

Temperature (°C)	Density	Temperature (°C)	Density
4	1,00000	31	0.99537
10	0,99973	32	0,99505
15	0,99913	33	0,99473
20	0,99823	34	0,99440
25	0,99707	35	0,99406
26	0,99681	36	0.99371
27	0,99654	37	0,99336
28	0,99626	38	0,99299
29	0,99595	39	0,99262
30	0,99567	40	0,99224

Source: William, Frank and Victor, (2010)

Scoot and Edward state in 2009 that this method is used the formula to measure the body fat level,

$$\text{The body fat level } = \left(\frac{495}{density} - 450\right) \times 100\% \quad (1)$$

with density is the body mass density. Meanwhile, to look for *density*, it is needed the formula bellow:

$$density = \frac{M}{V} = \frac{M_A}{\frac{(M_A - M_W)}{D_w} - V_r - V_{GI}} \quad (2)$$

with M is body mass in kg, V is volume after dividing body mass density by water mass density, M_A is body mass density in kg, D_w is water weight that spilled when the body get into the water, V_r is volume of gas left in the lungs after long breathing, V_{GI} is volume of gas in *gastrointestinal tract* [23].

Fig. 1. Skinfold Clippers

For example, a boy who has weight 75.20 kg, when getting in the bath up (full of water), the water spilled 3.52 kg, its temperatures 34°C (water density = 0.99440), the pulmonary residual volume of the lungs is 1.43 liter, volume of an additional subject is 0.1 liter. First step to be done is calculating the body density:

$$density = \frac{M}{V} = \frac{M_A}{\frac{(M_A - M_W)}{D_w} - V_r - V_{GI}}$$

$$density = \frac{M}{V} = \frac{75.20}{\frac{(75.20 - 3.52)}{0.99440} - 1.43 - 0.1}$$

$$density = \frac{M}{V} = \frac{75.20}{70.55} = 1{,}066$$

Next step is calculating body fat level:

$$body\ fat\ level = \left(\frac{495}{density} - 450\right) \times 100\%$$

$$= \left(\frac{495}{1.066} - 450\right) \times 100\% = 14{,}3\%$$

This method is considered quite difficult because of the use of many tools and the way to measure is taking much times, besides this method, there is sum method of total skinfold or known as *sum of skinfold*. The application of this method relies on *skinfold callipers* tool to measure the magnitude of fat folds in the skin layer then total the skinfold at the certain point.

Determine the motivation level of mothers in the high motivation category and low motivation by looking at the norm table of assessment sit and reach test by analysing the motivation using method bellows:

a. Orienting to their inner satisfaction,
b. Usually do the exercise diligently, regularly, discipline,
c. Never depending on others,
d. Having good characteristics, positive minded, honest, sportif,
e. And having activity permanently [11]

III. Results and Discussion

The chapter presents the results of the study and discussions. The presentation of the results of the study is based on statistical analysis performed on the initial test and the final test of body fat levels. The following sequences are presented on the description of data, test requirements analysis, hypothesis testing and discussion of research results.

A group of mothers who received zumba gymnastics and body gym exercises have different body fat levels. The result of the research showed that A1B1, the mothers group who joined body language with high motivation were getting 6,70 reduction. A1B2, the mothers group who joined body language

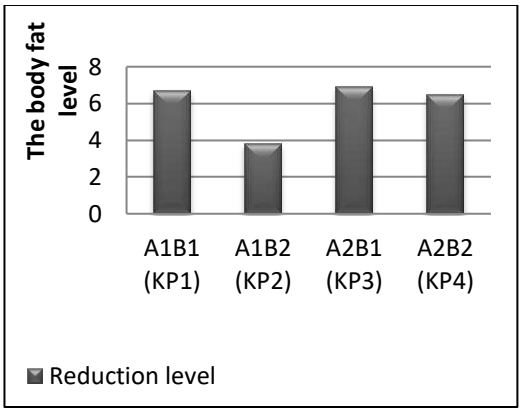

Fig. 2. Histogram average rate of reduction body fat levels each group based on type of exercise gymnastics in gymnastics training and motivation level.

with low motivation were getting 3,80 level. On the other hand, A2B1, the mothers group joined zumba with high motivation were getting 6,90 level. While A2B2, the group joined zumba with the low motivation were getting 6,50 level.

It proved that there is a significant influence between zumba gymnastics and body gym, ($F_{hitung} = 6.149 > F_{tabel} = 4.11$) which is the influence of zumba is better than body language gym. There is also a significant difference of the reduction in body fat level between the mothers whose high and low motivation, ($F_{hitung} = 4.570 > F_{tabel} = 4.11$) which is the reduction in the mothers' body fat level with low motivation is bigger than high motivation. The significant interaction between exercising gymnastic and motivation toward reduction body fat level, ($F_{hitung} = 7.962 > F_{tabel} = 4.11$).

Motivational differences affect the reduction in body fat levels. If between the groups of mothers who have high motivation and low compared, it can be seen that the group of mothers who have low motivation has a reduction in body fat level is better than the group of mothers who have high motivation.

IV. CONCLUSION

Based on the results of research and data analysis results that have been done, can be obtained conclusion that There is a significant difference of influence between zumba gymnastics and body gym to reduction of body fat level. There is a significant reduction in body fat level among high motivated mothers with low motivation. Reduction in body fat levels in mothers who have lower motivation greater reduction in body fat levels than mothers who have high motivation only a slight reduction in body fat levels. There is a significant interaction between exercise training and motivation to reduction body fat levels. A group of highly motivated mothers has a significant reduction in body fat levels when trained in body language gym exercises. Groups of mothers who have low motivation have a reduction in body fat levels are better if you get zumba exercise.

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Changes In Blood Sugar Level After Cycling For 30 Minutes

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***Abstract*— The purpose of this study is The change in blood sugar levels after cycling for 30 minutes. This was an experimental study. The criteria of this study are 17 years old, weight 50-55kg, glucose level 110-140mg/dl. The results of the calculation of blood glucose values before and after cycling obtained the difference of average 25.2. The calculation states that there is a decrease in blood sugar level after doing the cycling activity for 30 minutes.**

Keywords— blood sugar level, diabetes, insulin, cycling 30 minutes introduction

I. INTRODUCTION

A series of our daily activities make it difficult for many people to do sports in the midst of our busy routine, whereas good exercise needed to maintain our fitness. Health should be maintained because healthy is expensive, many people have high wealth and position but can not enjoy it because his body is no longer healthy because of the wrong lifestyle. Many people consume high-calorie foods but not balanced with physical activity often cause various health problems such as diabetes.

Diabetes is a disease that needs to be aware of. Most people realize they have diabetes after they are aged. Diabetes is one of the diseases that arise due to poor lifestyle. The World Health Organization (WHO) estimates that 177 million people worldwide suffer from diabetes [15].

Sekolah Menengah Atas Negeri 3 Serang is one of the public high schools in Serang city that has implemented Full Day School and has a fairly solid academic routine for their students. The students of SMAN 3 Serang start the lesson at 07.00 a.m. until 15.30 p.m.

SMAN 3 Serang is one of the public schools in Serang City that uses domicile system in the selection of their new students. A total of 30% seats are reserved for those who live in areas close to SMAN 3 Serang .

Blood is a body fluid that flows in the blood vessel system found in humans and animals. Blood sugar contained in the body is produced by foods that contain carbohydrates, proteins, and fats. Blood is a vehicle or medium to transport various nutrients throughout the body. Blood functions in transporting oxygen, nutrients and metabolic waste from the heart to the whole body and back to the heart [16].

All types of carbohydrates that are consumed by human beings are either complex carbohydrate types (rice, potatoes, bread, cassava etc) or simple carbohydrates (glucose, sucrose, fructose) will be converted into glucose in the body. This formed glucose can then be stored as energy reserves as glycogen in the liver and muscles and can be stored in the blood or can also be brought into the cells of the body in need [17].

Glucose contained in the bloodstream is what is referred to as blood sugar levels. Glucose levels in arteries is 15-30 mg / dl higher than in veins. Blood glucose concentration or glucose level is tightly regulated in the body. Glucose that stream throughout the body is the main source of energy for the body's cells.

Heart Glucostat. The liver has the ability to maintain blood sugar concentrations in order to remain normal in some circumstances. During exercise, muscle calorie needs are initially filled with glycogenolysis in the muscle and increased glucose uptake. Plasma glucose is initially elevated due to increased glycogenolysis of the liver but may decrease due to heavy and prolonged exercise [5].

The plasma glucose level at one time is determined by the balance between the amount of glucose that enters the bloodstream and the amount that leaves it. Five percent of glucose consumed directly in conversion to fat. The rest is metabolized in muscles and other tissues. At the time of fasting, the liver glycogen is disport and the liver adds glucose to the bloodstream. If the fast is longer, glycogen runs out and there is an increase in gluconeogenesis of amino acids and glycerol in the liver. There is a moderate decrease in plasma glucose to about 60 mg / dL during prolonged hunger in normal people, but no symptoms of hypoglycemia occur because gluconeogenesis prevents further reduction.

Table 1. Blood Glucose Levels in Several Circumstances and Times

Time / Circumstances	Blood Sugar Level (mg/dl)
In the morning (right after wake up)	70-100
Before Lunch	70-110
2 Hours after lunch	110 – 140
Fasting blood sugar level	95 – 135

Source: Neil F. Gordon. Diabetes: Your Complete Exercise Guide. Canada, Human Kinetics Publiser, 1993.

Thus, William F. Ganong points out that the liver functions as a kind of "glucostat", which will maintain blood sugar levels. The liver can also help dispart fructose and galactose into glucose and glucose into fat. This can happen because of hormonal activity secreted by the islets of Langerhans in the pancreas. Two of these hormones, insulin and glucagon, have important functions in regulating metabolism between carbohydrates, proteins and fats. The third hormone, somatostatin plays a role in regulating the secretion of the islets of Langerhans cells, and the fourth physiological function of the hormone, the pancreatic polypeptide is unknown [6].

The hormones that play an important role in the regulation of blood sugar levels to remain in normal circumstances:
Insulin. Insulin is a hormone that is naturally secreted by the pancreas into the bloodstream and then circulates throughout the body. The function of insulin is to help blood sugar entering the cells. If insulin is very little even none or can not function normally, then the sugar can not get into the cell. As a result sugar can not be used to make energy. This situation causes cells to starve.

The main regulator of insulin secretion is induced by the direct feedback effect of blood sugar levels on the pancreas. Glucose permeates the islets of the Langerhans easily and the rate of income is not influenced by insulin. If blood sugar levels that promote pancreas increase (in mice above 110 mg / dl), insulin secretion in the blood of the pancreatic venosa increases, if the levels are normal or low, the speed of insulin secretion is slow.

Insulin is an anabolic system, increasing the deposits of glucose, fatty acids and amino acids. Inclusion of glucose into the skeletal muscle increases without insulin. Insulin facilitates the entry of glucose into cells by increasing the number of glucose transporters in the cell membrane.

Without insulin, the entry of glucose into the skeletal muscle may increase during exercise. Doing regular exercise can result in a prolonged increase insulin sensitivity. Exercise can also cause hypoglycemia due to increased glucose uptake in the blood. Sugar that can not enter the cells will be in high concentrations in the blood, if it lasts long it can cause diabetes.

Glucagon is glycogenolytic, gluconeogenetic, and lipolytic. It increases blood sugar because it stimulates adenylate cyclase in liver cells. Adenylate cyclase tends to activate phosphorylase therefore it increase the breaking of glycogen. Like insulin, glucagon is a protein hormone produced in the pancreas, glucagon is an insulin balancer.

Glucagon is also catabolic, mobilizing glucose, fatty acids and amino acids from its reserves into the blood. Approximately 4-6 hours after eating, the level of glucose in the blood is reduced. This triggers the production of glucagon in the pancreas, when the pancreas secretes insulin glucagon will be pressed. Glucagon signs the liver and muscles to dispart glycogen into glucose and pull it back into the bloodstream, keeping your blood sugar levels low.

Eating proteins and infusing various amino acids increases glucagon secretion. It seems that in this case, what suitable and potent are glucogenic amino acids, because they are amino acids that are converted into glucose in the liver under the influence of glucagon. Increased glucagon secretion after eating protein is also beneficial, as amino acids stimulate insulin secretion, and the secreted glucagon prevents the development of hypoglycemia while insulin facilitates the storage of absorbed carbohydrates, fats and lipids. Glucagon secretion increases hunger time. It reaches its peak on the third day of fasting, at the time of maximum gluconeogenesis. After that, plasma glucagon levels decrease the time fatty acids and ketones become the main source of energy.

Glucagon does not cause glycogenolysis in the muscles. It increases the gluconeogenesis of the amino acids available in the liver and increases the speed of its metabolism.

These two hormones between insulin and glucagon are opposite in their ways of working, and in many cases are secreted in opposite ways.

Cycling is one of the best activities to improve heart fitness. Heart fitness is measured by aerobic capacity, ie the ability to exercise large muscles and whole bodies at moderate to high intensity levels for long periods of time [4].

Cycling becomes the best way to practice for 20 to 30 minutes every day, 3 to 5 days each week to get good health and wellness. In Bikemania, it is explained that the human body is designed to move. Research has shown that exercising regularly for 30 minutes in one day provides many benefits, even though the 30 minute time is divided into two or three different sessions. If you are over 40 years of age, being overweight or never exercising regularly for long periods of time, it is important that you consult your doctor first before starting a cycling program [8].

Cycling is identic with physical activity or physical exercise that can be done by everyone. Physical activity includes activities that involve body movement. Therefore, cycling can spur heart rate in accordance with the target we want. Physical activity such as sport is one form of work. To be able to do work like exercise our body needs energy.

When we exercise (cycling), muscle energy requirements are initially fulfilled by muscle glycogenolysis, after the glycogen in the muscle is reduced there will be an increase in glucose uptake in the blood. Plasma glucose initially falls due

to muscle retrieval but may return to normal due to glycogenolysis of the liver (liver glucostat).

Fulfillment of energy during physical activity is obtained through metabolic processes. Metabolism is a chemical process that allows cells to survive. In general, sports activities consist of two types of activities: aerobic activity and anaerobic activity. Aerobic activity is a low to moderate intensity exercise activity that can be done continuously and over long periods of time.

Aerobic exercise involves large muscle groups and is performed in moderately low intensity, as well as in considerable time. Aerobic exercise is maintained from 15 -20 minutes to several hours in a single exercise [11].
The formation of energy in the muscle is as follows:

- Aerobics
- Glycogen and free fatty acids + P + ADP + O2 ↔ CO2 + H2O + ATP.
- Anaerobic
  1. ATP↔ ADP + P + Free energy
  2. Creatine posphat + ADP ↔ Kreatin + ATP
  3. Glycogen / Glucose + P + ADP ↔ Lactate Acid + ATP (Astrand M.D, 1970).

Aerobic exercise can be done with low to moderate intensity cycling. Here are some models of cycling exercises in low intensity zones and short periods of time.

The use of energy at various cycling speeds is more or less as follows [13]:
9.6 km / hr: 270 Kal / hr
12.8 km / hr: 330 Kal / hr
16 km / hr: 400 Kal / hr
17.6 km / hr: 450 Kal / hr
19.2 km / hr: 550 Kal / hr
20.8 km / hr: 650 Kal / hr

Cycling for 30 minutes at a speed of 26 km / h then there will be a working effect that will affect the concentration of blood sugar levels. Blood sugar in the blood will decrease due to increased glucose uptake in the muscle but blood sugar levels will return to normal conditions due to the presence of the liver as glucostat that keep blood sugar concentration levels.

Table 2. Model Exercise 1 Slow Rider.

Distance	5 mil
Time	20 minutes
Terrain	Flat Road
Speed	Slow. Switch if necessary for constant workload. Keep the pedal round at 85-90 RPM
Workload	60-65% heart rate max

Table 3. Model Exercise 2 Slow Rider

Distance	6,25 mil
Time	25 minutes
Terrain	Flat Road
Speed	Slow. Switch if necessary for constant workload. Keep the pedal round at 85-90 RPM
Workload	60-65% heart rate max

Source: Chris, Carmichael. Bugar dengan Bersepeda. (Jakarta: P.T Raja Grafindo, 2003), h.52.

Table 4. Model Exercise 3 Slow Rider

Distance	8 mil
Time	30 minutes
Terrain	Flat Road
Speed	Slow. Switch if necessary for constant workload. Keep the pedal round at 85-90 RPM
Workload	60-65% heart rate max

Source: Chris, Carmichael. Bugar dengan Bersepeda. (Jakarta: P.T Raja Grafindo, 2003), h.54.

The following is the number of normal pulses per minute:
1. Infants up to 1 year of age: 100 -150 times per minute
2. Children aged 1-10 years: 70 -130 times per minute
3. Children aged 10-18 years: 60 - 100 times per minute
4. Adults: 50 - 80 times per minute (Evelyn C Pearce, 1999).

Measuring maximum pulse rate
Formula: 220 - Age
Example: 220 - 17 = 203 / min.
Measuring Activity Percent

After doing the activity cycling with a speed of 26 km / h and a distance of 13 km, then measured again his pulse and pulse rose to 130 - 135 / minutes.

Formula :
Activity Pulse / Pulse Maximum x 100%
= 130/203 x 100
= 65%

Thus, with a speed of 26 km / h and a distance of 13 km. The effort performed shows the pulse of activity 65% of maximum activity / maximum pulse rate.

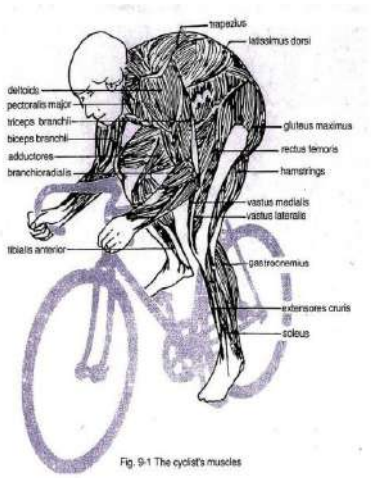

Fig. 1. Muscles that play a role during cycling

Fig. 2. Type of Bike Used

Fig. 3. Cyclomp

II. METHOD

This research is an experimental study. With a One Group Preliminary Test and Post Test design using purposive sampling method. Pretest done before treatment and post test after treatment. As for the free variable is a cycling exercise for 30 minutes, while the dependent variable is the blood sugar level.

The instruments used to collect data in this study are:

1. 4 pieces of blood glucose measuring device (Glucometer)
2. Strip for blood
3. Needles
4. Soft click
5. Alcohol
6. Tissue
7. Paper
8. Ballpoint
9. 10 units of mountain bikes using 3 gear
10. 4 tester.

Data Collection Technique. In this study the data was taken by measuring blood sugar levels by 20 people testee, then testee do a blood sugar measurement test after fasting for 2 hours and after biking for 30 minutes with the following implementation procedures:

1. The sample is divided into 2 groups, the first group breakfast at 07.00 am and the second group at 07.30 pm.
2. Samples taken blood glucose level 2 hours after meal, first group at 09.00 pm and second group at 09.30 pm.
3. Samples sit relaxed to the blood taken as much as one drop.
4. At first, prepare the glucometer tool along with chips and needle.
5. Then select one of the sample fingers and wipe with a cotton containing alcohol to sterilize.
6. Adjust the length of the needle according to the sample skin thickness. Then puncture until the blood comes out. And input the blood into the chip on the glucometer.
7. Wait for the result from the glucometer tool then record the result.
8. After the initial data obtained then the sample cycled with a speed of 26 km / hr crossing the road to SMAN 3 Serang with a travel time of 30 minutes and mileage of approximately 13 km.
9. After 30 minutes of cycling, the sample stops and will be retrieved immediately (post test).
10. Then select one of the sample fingers and wipe with a cotton containing alcohol to sterilize.
11. Adjust the length of the needle according to the sample skin thickness. Then puncture until the blood comes out. And input the blood into the chip on the glucometer.
12. Wait for the result of the glucometer tool and record the result.
13. Samples are not allowed to consume anything since the initial test (pre test) until completion of the final test (post test).

III. RESULT AND DISCUSSION

A. *Description*

Data collected at the time of the study was used as research data obtained from the initial test and the final test of blood sugar levels. The data can be described as:

Table 5. Description Data Research Pre Test and Post Test Blood Sugar Levels

Variable	Initial Blood Sugar Level (mg/dl)	Final Blood Sugar Level (mg/dl)
Maximum Value	132	111
Minimum Value	112	86
Average	121,7	96,5
Standard Deviation	5,48	7,87
Standard *error*	1,25	1,80

Table 6. Distribution Frequency Pre Test Blood Sugar Level

Class Interval	Frequency Presentage
112 – 116	25 %
117 – 121	20%
122 – 126	30%
127 – 131	20%
132 – 136	5%
Total	100%

Table 7. Distribution Frequency Post Test Blood Sugar Level

Class Interval	Frequency Presentage
86 – 91	40 %
92 – 97	25 %
98 – 103	10%
104 – 109	20%
110 - 115	5%

Data descriptions in this study include the highest score, mean value, standard deviation, standard error, frequency distribution, and histogram of each variable. Here's the complete data:

The collected data on changes in blood sugar levels in the initial test showed a range of 132 mg / dl and the lowest value of 112 mg / dl with an average blood sugar level of 121.7 mg / dl. Standard deviation (SD) of 5.48 and standard error (SE) of 1.25. This can be seen in the following frequency distributions:

Based on the table 3 it can be concluded that the largest frequency at intervals 122 - 126 with the percentage of 30% and the smallest frequency is at intervals 132 - 136 with percentage of 5%.

Based on the table 4 it can be concluded that the largest frequency at intervals 86 - 91 with a percentage of 40% and the smallest frequency is at intervals 110 - 115 with percentage 5%.

B. Hypothesis testing

The average score of the results obtained at the initial test was 121.7 mg / dl and in the final test of 96.5 mg / dl. From the average data on the initial test and the final test on blood sugar tests showed a decrease in the results obtained. From result of data analysis obtained difference of mean 25,2 with standard deviation difference (SDd) that is equal to 5,02 and standard error difference average equal to 1,15 in subsequent calculation obtained t-count equal to 21,91 and t-table value with degree of freedom (n-1) and significant level of $\alpha = 0,05$ is 2,09. Since the t-count is greater than the t-table value, it indicates that (H0) is rejected and (H1) is accepted.

This means that the results of the calculation stated that the activity of cycling for 30 minutes can lower blood sugar levels in students of class XI SMA Negeri 3 Serang

IV. CONCLUSION

Based on the problems presented and supported by the theoretical descriptions, existing research data, and analysis of data that has been done, it can be concluded that: There is a 30-minute cycling effect on the change of blood sugar levels in students of grade XI SMAN 3 Serang.

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Analysis of Energy Need and Adequacy of Athlete Based on Physical Activity Measurement Using Pedometer

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***Abstract*— Physical activity is an important component in measuring energy need of an athlete. Pedometer is a tool to estimate energy expenditure from physical activities based on footsteps. This study aims to analyze the differences of energy needed and adequacy on athlete based on physical activity measurement by using pedometer and calculation. This is an observational study with cross sectional design in 4 football school in Semarang. The samples of this study were 76 athletes aged 15-20 years old. The subject of study was selected by using consecutive sampling. Independent variable was energy expenditure from playing football measured by using pedometer and calculation. The dependent variable was energy need and adequacy. The data of food intake through recall of 3x24 hours. The means of energy adequacy based on energy expenditure from playing football is using calculation was 63,12±10,50 kcal, meanwhile by using pedometer was 70,57±12,70 kcal. The means of energy need based on energy expenditure from playing football is using calculation was higher than using pedometer, with the value of difference was 359 kcal. There was a difference in the means of energy need and adequacy based on energy expenditure from playing football by using calculation and pedometer.**

Keywords— pedometer, energy adequacy, energy need, athlete, football

I. INTRODUCTION

Athletes must concern about their physical condition and health in order to perform optimally in all competition. High achievement in sport needs to be retained and improved. One of important factors to realize is through athlete's diet. The guidance of diet on athlete based on balanced nutrition which means that the energy intake is equal to the energy used for activity and exercise. The food intake of an athlete should be in accordance with the need for daily activity and exercise [1].

One of the sports that requires good nutrition management is football. Football is a sport that requires high energy and can be synchronized with energy needs for very heavy workers. Physical activity performed by athlete is running, kicking, jumping and sprinting with a fairly high percentage. Football athletes require energy 3800-3900 calories each day to perform various activities [2]. It was found frequently that energy adequacy in football athletes is not adequate. Research shows that as much as 41,7% energy adequacy level in adolescence football athletes in Denpasar is low [3]. The lack of nutritional intake in athletes resulted in low performance so that achievement was decreased.

The problem that often occurs in Indonesian athletes during the match is fatigue due to lack of energy reserves and high levels of lactic acid in the blood. Athletes need adequate energy intake during a match. Energy serves as a fuel that activates muscle contraction and maximizes athlete performance. Motion occurs in sports due to muscle contraction. Muscles can contract because of the energy release of ATP available in muscle cells. ATP in cells is limited in number and can be used as an energy source in just 1-2 seconds. Muscle contractions will continue if the reduced ATP is reformed. The re-establishment of ATP can be derived from the creatine phosphate, glucose, glycogen, and fatty acids [4].

The need for nutrients in athlete increases because of the large energy expenditure used for exercise activities. The nutritional need of athletes is individual based on gender of athlete, age, body weight, and physical activity consisting of

exercise activity and daily activity [1]. Physical activity becomes an important component in the assessment of nutritional needs of athletes. There are several ways of determining the energy expenditure on physical activity. One of them by using a physical activity questionnaire. A physical activity questionnaire will record the daily and exercise activity of athletes and then calculations will be performed to get an estimation of energy expenditure. In addition, there is a way of measuring physical activity using a pedometer. This tool can be put at body part such as grips, wear as necklace or put in pocket. A pedometer is a tool for estimating energy expenditure by footsteps [5]. Measurement of energy expenditure on physical activity using a pedometer is able to determine the actual number of nutritional needs of athletes.

The tools widely used by sports nutrition practitioners in determining the energy expenditure during the activity are with a physical activity questionnaire. In other hand the measurement of physical activity using a pedometer has not been used. Based on this background, author was interested to do analysis on the measurement of physical activity by using a pedometer and calculations.

II. Materials and Methods

This Study is an observational study with cross sectional design in 4 school of football that is Terang Bangsa, Ungaran Satria Kencana Serasi Semarang, Ekoprimafera Football Club (EPFC) and PSSI Team PORProv. The samples in this study were 76 subjects. The inclusion criteria in this study subjects were athletes aged 15-20 years, not being injured or attending medical care and willing to follow the research by filling out the Informed Consent form. The subjects were selected by consecutive sampling. Independent variable was physical activity from playing football measured by using pedometer and calculation. Dependent variable was energy need and adequacy. Subjects who met the inclusion criteria were taken food intake data and energy expenditure from playing football measured by using pedometer and calculation.

Energy needs are calculated from the sum of several components: basal energy, physical activity and specific dynamic action (SDA). This study calculated 2 energy needs. Energy need of A is the energy need calculated from the sum of basal energy, energy from daily activity, energy from playing football based on calculation, energy from other exercises and SDA [1]. The physical activity data of football exercise and other exercises was obtained through interviews using questionnaires. While the energy need of B is calculated from the sum of basal energy, energy from daily activity, energy from playing football based on pedometer, the energy from other exercises and SDA. Energy intake is the average amount of energy intake of food, beverages and supplements consumed by the subject each day obtained by using a 24-hour 3-day recall method not in sequence [6]. Energy intake data is converted into kcal units calculated using nutrisurvey software. Energy adequacy is the ratio of the average energy intake of athletes to individual energy needs. There are 2 adequacy of energy that is energy adequacy of A based on energy need of A and energy adequacy of B based on energy need of B.

Physical activity is energy expenditure from playing football. This study calculated 2 energy expenditure from playing football that is measured by calculation and pedometer. Pedometer is an instrument to measure estimation of energy expenditure from physical activity based on footsteps. Pedometer used in this study was Omron HJ-313. Pedometers were worn around the athlete's neck during a football match.

Univariate analysis was conducted by presenting the data in the frequency distribution table of the variables. Bivariate analysis was conducted to find out the difference between independent variable with dependent variable. Kolmogorov-Smirnov normality test was conducted, the Wilcoxon Test was used to analyze the difference between the energy expenditure from playing football based on calculation and pedometer. Dependent T test was used to analyze the difference of energy need and energy adequacy of athlete based on physical activity using calculation and pedometer. Data analysis using SPSS with 95% confidence degree ($\alpha = 0,05$).

III. Results and Discussions

The numbers of subjects in this study were 76 football athletes. Football athletes who follow the study have an age range of 15-20 years. Subjects were dominated by 15-year-old football athletes (26,3%, n = 20 subjects) and 16 years (26,3%, n = 20 subjects). While the subject with the least number of football athletes aged 19 years (7,9%, n = 6 subjects).

Table 1 shows the mean body mass index (BMI) and the body fat percentage of the subjects was 20,7 kg/m^2 and 18,56%. This shows that most athletes have a BMI and a normal body fat. BMI and body composition is one of the supporting performances of athletes. A study says that football athletes who have a normal BMI risk 13.2 times more fit than athletes who have overweight BMI status [7].

The average energy expenditure from playing football based on the calculation is 830,89 kcal, while pedometer was 471,89 kcal. It can be concluded that the average energy expenditure from playing football by using calculation was greater than pedometer. Energy expenditure from exercise is one of the components used to calculate total energy needs a day or total energy expenditure (TEE) [8]. Measuring the energy expenditure from exercise is difficult, because each individual has a different movement and the appropriate instruments are needed to be able to calculate the more appropriate energy expenditure [9]. A pedometer is a device that measures estimation of energy expenditure through the footsteps. According to research, pedometer was used to measure footsteps [10] and accurate instruments used in adolescents [11].

Based on Table 2, it is known that the player with a defensive midfielder has the highest energy expenditure of 499,65 kcal when compared with the player with another position. The striker's position also has a high energy expenditure, average at 496,55 kcal. The results of this study

are in line with the study which states that the player in the position of the midfielder has the highest total mileage so that has a higher level of energy expenditure than the other players [12]. This can happen because the midfielder has the intensity of running or sprint higher than the other players [13]. In addition the midfielder has the task of two tasks at once, namely as defender and attack / regulator attack, and has a wider travel region than the players other positions [14].

Table 3 shows that 94.8% of football athletes have normal nutritional status, while 3 subjects had underweight and 1 subject had overweight. As many as 93.4% of football athletes have a normal body fat, 4 were underfat, and 1 subject was overfat. Percent body fat is one component of the body composition that affects the performance of athletes. The study states that the percentage of fat ($r = -0,670$, $p = 0,024$) of the body has a negative relationship with muscle strength, where muscle strength is one component of performance support and athlete performance [15].

TABLE 1: Characteristic of Subject

Variable	Minimum	maximum	Mean ±SD
Body weight (Kg)	41,0	74,5	57,89±7,40
Body height (cm)	152,2	182,0	167,10±6,30
Body Mass Index (Kg/m^2)	16,1	26,2	20,7±2,01
Body Fat Percentage (%)	10,5	27,4	18,56±3,11
Energy expenditure from playing football based on calculation (kkal)	562,67	1170,71	830,89±141,33
Energy expenditure from playing football based on pedometer (kkal)	279	744	471,89±94,63
Energy intake (kkal)	1062,60	2995,50	2178,30±347,00
Energy need of A[a] (kkal)	2497,49	4541,68	3481,83±443,37
Energy need of B[b] (kkal)	2261.55	4147.11	3122,83±390,03
Energy adequacy of A[c] (%)	33,52	84,49	63,16±10,49
Energy adequacy of B[d] (%)	39,36	95,18	70,57±12,70

[a] Energy needs based on energy expenditure from playing football by using calculations,
[b] Energy needs based on energy expenditure from playing football by using pedometer,
[c] Percentage energy adequacy based on energy need of A,
[d] Percentage energy adequacy based on energy need of B.

TABLE 2. Description of average energy expenditure of position in football

Position	n	Mean energy expenditure
Defender /back	**31**	**452,32**
Center back	13	416,31
Right back	6	440,33
Left back	6	481,67
Wing	6	471,00
Midfielder	**34**	482,31
Defending Midfielder	20	499,65
Right wing	8	477,62
Left wing	6	469,67
Striker	**11**	496,55
Total	**76**	

TABLE 3. Description of nutritional status, percent body fat and energy adequacy

Variable	n	%
Nutritional status		
Underweight	3	3,9
Normal	72	94,8
Overweight	1	1,3
Percent of body fat		
Underfat	1	1,3
Normal	71	93,4
Overfat	4	5,3
Energy adequacy based on energy need of A[a]	6	7,9
adequate	70	92,1
low		
Energy adequacy based on energy need of B[b]	19	25,0
adequate	57	75,0
low		

[a] Energy needs of A based on energy expenditure from playing football by using calculations,
[b] Energy needs based on the energy expenditure from playing football by using pedometer.

The energy adequacy based on energy need of A has a higher proportion of subjects with lower adequacy (92.1%) than energy adequacy based on energy need of B (75%). The difference in the energy expenditure from exercise can affect the estimated total daily energy need or total energy expenditure (TEE). This causes a difference in the level of energy adequacy in athletes.

Based on Table 4 it is known that there are differences in energy expenditure from playing football, energy need and energy adequacy based on calculation and pedometer. Median energy expenditure from playing football based on calculation is higher than (793.18 kcal) pedometer (492 kcal). The difference in energy expenditures is 301,18 kcal. The mean energy need based on energy expenditure from playing football by using calculation (3841,77 kcal) is higher than pedometer (3122,77 kcal). The difference in energy need based on energy expenditure from playing football by using calculation and pedometer is 358.99 kcal. The mean percentage of total energy adequacy based on energy need of A (63,12%) is lower than energy adequacy based on energy need of B (70,57%). The percent difference in energy adequacy based on energy need A and B is 7.40%.

Adequacy of nutritional intake in athletes is important because it affects the health and performance of athletes, especially adolescent athletes who are still in its physical growth [16]. In the determination of athlete's intake, physical energy activity measurements are used to calculate the total energy expenditure (TEE) estimates. TEE consists of three components: basal metabolic rate (BMR) or resting energy expenditure (REE), thermic effect of food (TEF), and activity energy expenditure (AEE) [8]. The measurement of physical activity during the exercise needs to be done in detail, including the frequency, intensity, and type of activity as these measurements will be taken into account in determining the AEE value and affecting the TEE value. The problem that arises so far is in determining a valid and reliable instrument in calculating physical activity during exercise. Due to the tool limitations. Questionnaires are the most commonly used tools although heart rate monitoring or movement is judged to be more accurate and reliable [9].

TABLE 4. Bivariate Analysis

Variable	mean/median	Δ (delta)	*p*
Energy expenditure from playing football based on calculation (kkal)	793,18	301,18	0,001*
Energy expenditure from playing football based on pedometer (kkal)	492		
Total energy need of A (kkal)[a]	3841,77±443,38	358,99±160,45	0,001**
Total energy need of B (kkal)[b]	3122,77±390,03		
energy adequacy of A (%)[c]	63,12±10,50	7,40±3,67	0,001**
energy adequacy of B (%)[d]	70,57±12,70		

[a] Total energy need based on energy expenditure from playing football based on calculation,
[b] Total energy need based on energy expenditure from playing football based on pedometer,
[c] Energy adequacy based on energy need of A,
[d] Energy adequacy based on energy need of B.
*Wilcoxon, **Dependent t test

This study shows that there is a difference of median energy expenditure from playing football based on calculation (793.18 kcal) and pedometer (492 kcal). According to recent study, the differences in physical activity values as measured by questionnaires and accelerometers can occur because the value of physical activity with the questionnaire only relies on the estimates of the subject and the value becomes higher than the value of the accelerometer [17]. These results are supported by study, which states that the use of accelerometer in calculating physical activity is more consistent than the use of questionnaires in males (r = 0.04) [18]. In addition to accelerometers, pedometers can also be used as an alternative in calculating the energy expenditure of physical activity in football athletes this can calculate energy through footsteps [10] and accurate instruments used in adolescents [11].

The difference in the proportion of energy adequacy based on energy need of A and based on energy need of B occurs due to different methods of measuring the energy expenditure during the exercise (playing football). The energy expenditure during exercise is one of the components used to estimate the energy needs during the day / TEE [8]. The balance of energy is the main thing that adolescence need to keep in mind to maintain optimal growth and development, as well as additional energy intake to replace energy expenditure due to daily exercise and competition [19]. Adolescent athletes with sustained energy deficiencies are at risk of impaired growth and development [20]. Energy intake is needed to maintain the physical endurance of the athlete. Research in Salatiga says that energy intake is positively associated with the physical endurance of te athlete (p = 0.046) [21]. The results is in line with the research which mentions that the energy intake before the game has asignificant effect on endurance athele (*p* = 0,002) [22].

IV. CONCLUSION

There was a difference in the mean of energy need and adequacy based on energy expenditure from playing football by using calculation and pedometer. The mean of energy need based on energy expenditure from playing football by using calculation was higher than using pedometer, with the value of difference was 359 kcal. For the athlete's food service department, it is advisable to consider the pedometer in determining the nutritional needs of athletes. It is important to determine the Total Energy Expenditure (TEE) that suits the actual needs of the athlete in order to avoid underestimated or overestimated total energy needs.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

Development of Warm-Up Models for Hockey Game

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***Abstract*— The study is aimed to make a warm-up game of hockey and improve motivation training, research for four months in September - December 2017. The research method is using the method of research and development (R & D), according to the Sukmadinata models, where this study uses three stages of the preliminary study, development, testing. The result of this research is producing products in the form of a warm-up game of hockey as much as 20 a models that has been tested in small groups involving 15 hockey athletes and test a large group, involving 30 hockey athletes. Before they were given a warm-up, researchers took the initial tests on motivation training, the pretest in the can of 3401. After that the application of the warm-up is done for eight sessions. The researchers did posttest to get results for score 3628. The average pretest score 113.37, post test score 12.590, and the test results t is 9.737.Based on the results of research shows that the warm-up is to be applied and in use in improving motivation training. The end result of warm-up for hockey athletes in the form of a warm-up models.**

Keywords— warming up, game, hockey state university of Jakarta introduction

I. INTRODUCTION

Hockey is one of the most popular sport of achievement, hockey game is played in teams using skin guard, ball, hand protection (glove), as well as stick that serves to hold, carry, and hit the ball.

The resounding achievement of Jakarta State University hockey shows that this team deserves to be called the best team in Indonesia. High school level students who cultivate hockey sports are many who enroll in the State University of Jakarta through the path of hockey sports achievements. The hockey team sporting exercise schedule is held every Tuesday, Thursday and Saturday at 4 pm-6pm at the Serba Guna (GSG) Faculty of Sports Sciences.

In general, before exercise or warm-up exercises first after it enters the core of exercise and the last cooling, heating is intended to stimulate the function of organs and prepare the condition of the muscles that is by heating the body temperature to avoid injury at the time of exercise.

At the time of warming the lack of variation in movement, the inner factor of the athlete due to the dense college activity makes the athlete feel tired for exercise accompanied by a warming movement that lacks an element of fun that seems exhausting, some athletes forget about warming because they are too eager to get into the core exercise. While athletes who come late to exercise they only make the movement sekedarnya because it was too late and immediately entered into the core exercise without thinking of the risks that will be experienced.

Moreover, if the exercise program is low intensity so that some athletes feel less warm up, to do the warming up movement needs motivation from within a person to do it seriously without any coercion.

II. METHODS

This research uses Research & Development (R & D) method to validate the product in the form of the development of warm-up model for hockey game for hockey athletes State University of Jakarta. According to Borg & Gall R & D in education is an industry-based development model where research findings are used to design new products and procedures, which are then systematically tested in the field, evaluated and refined to meet certain criteria

Design in research and development is based on systematic data derived from practice. Through systematic study there is a design, development and evaluation process with the aim of establishing an empirical basis for creating instructional and non-instructional products as well as new and improved tools and models. This is a way to test the theory and to validate the product, in addition to creating new procedures, techniques and tools based on specific analysis. Product design and development as well as instructional programs are at the heart and IDT (Instructional Design & Technology).

Stages of this research is a procedure taken in making the development of warm-up model for hockey game. The end result of this study is to provide knowledge to the athletes hockey State University of Jakarta about the heating is very important and heating can be done through the game.

III. RESULTS

A. Results of Needs Analysis

Needs analysis on warm-up model for hockey game research at hockey sports clubs State University of Jakarta aims to analyze the needs of the warm-up model to be done

The results of needs analysis in this study using interview data with sports club coach hockey achievement State University of Jakarta on December 5, 2017. Here described the results of needs analysis obtained by researchers.

B. Early Product Creation

After completion of the needs analysis phase continued with the initial product creation. The results of the needs analysis encourage researchers to make a model of warm-up hockey game with 20 models of warm-up.

C. Expert Evaluation

Before the game model that has been made can be declared valid and feasible to be tested to the subject of research, the researcher first perform the validation or feasibility test warm-up models for hockey game to two experts: 1 expert game, 1 expert hockey. Both experts assess the design of the model made so it will be worth to be tested. Based on expert test conducted can be drawn the conclusion that there are 20 models of decent warm up in trial.

Warm-up model for hockey game for hockey athletes State University of Jakarta is feasible and can be used for heating.

Expert tests conducted by researchers on two experts there are some suggestions that build to refinement Warm-up models include:

1. Game experts suggest to sort the game from the easiest level up to the difficult level.
2. Expert Hockey advises on some games to pay attention to when the game begins not to be left too long queue up to wait their turn.

D. Product Revisions

Based on the data collected from each expert, there are several product designs that need to be revised before becoming a final model and tested in small groups. The product revision is intended to make the product design more perfect.

Based on the results of small group experiments conducted by researchers that 20 models of warm up done feasible to use and can be tested to the next stage is a large group trial.

E. Hockey Game Warming Up Models

1. Kucing dan Tikus
2. Bola Punggung
3. Zigi-zaga
4. Tiup Gerak
5. Kompas
6. Melangkah melewati rintangan
7. Bercermin
8. Putar Pinggang
9. Membuat Pyramid
10. Mengisi kotak tic tac toe
11. Mencari Warna
12. Memberi Bola
13. Terowongan Bola Berantai
14. Jalan Kepiting
15. Berputar Mendapatkan Bola
16. Balapan Ular
17. Mengejar Balon
18. Keranjang Bola
19. Estafet Bola
20. Mengoper Bola

IV. CONCLUSION

Based on data on the research results that have been validated experts there are 20 models of warm-up. Small group trial with 15 random samples, tested by 20 models of warm-up, so large group trials of 30 random samples and 120 models of warm-up, as well as discussion of the results of the study, the researchers can draw the conclusion that:

1. Warm-up models for hockey game can be developed and applied in the sports practice of ihockey achievement sport of Jakarta State University.
2. Warm-up models for hockey game that has been developed, obtained the data of effectiveness and the results of Warm-up models for sports club hockey achievement State University of Jakarta.

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Anthropometric Factors And Physical Condition Dominant Determining Overhead Throws And Batting Skills In Softball

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***Abstract*—Anthropometric factors and physical condition, among others, height, arm length, arm muscle strength, hand-eye coordination, balance, and reaction time. This research goal is to determine the anthropometric factors and the physical condition of the dominant determinant of overhead throws and batting skills in softball. This research approach uses a quantitative to design of confirmatory factor analysis. This research population is training student achievement softball in Sports Education University of Riau. A sample of 100 people was obtained through a proportional random sampling technique. The data used are taken through a series of tests of the independent and dependent variables. This research method through testing confirmatory factor KMO and Bartlett's Test analysis using SPSS Results from this research is: factor of Anthropometry and dominant physical condition determinants is arm length with value 0,818, arm muscle power with value 0,751, hand eye coordination with value 0,837 and balance with value 0,775. The conclusion of this research is: the factor of Anthropometry and dominant physical condition determinants overhead throws skill and batting skill in game of softball is arm length, the arm muscle power, the hand eye coordination and balance. While the factors not determine is height and reaction time.**

Keywords— anthropometri factor, physical condition, overhead throw, batting skill

I. INTRODUCTION

Softball is a small ball game born in the United States created by George Hancock in the city of Chicago in 1887. Softball in Indonesia is often called softball. Softball is the development of similar sports such as baseball or hardball. Although at first glance looks the same but softball and baseball have some pretty basic differences, the difference is baseball is only played by men. So sometimes baseball is also called hardball, while softball can be played by men and women. The softball ball is also a few inches bigger than a baseball ball. Softball is played by two squads with each team consisting of 9 players consisting of 7 inning [4]. By collecting numbers from hitting the ball. The start of the game begins with a pitcher (throw), by throwing a ball with a spin to the batter using a bat. The two teams are one of the defensive and the other becomes the offense team each competes to collect the numbers by spinning the three base runners must touch each base until it returns to the home plate, the batter can return to home plate with survived to get one [5].

The success of coaching improves the softball skills especially throwing and batting requires various supporting components. Physical condition is one of the factors that determine performance or appearance, so the collapse of physical condition will lead to loss of skills [2].

Coaching physical conditions in sports that if an athlete wants to perform must have physical conditions such as: strength, endurance, muscular power, speed, coordination, flexibility, agility, balance, accuracy, reaction. Based on the physical condition component a softball athlete must know what components of physical condition affect their basic engineering skills especially on top-throwing and hitting techniques such as strength, muscle explosive power, coordination, precision, and reaction [2].

Be advised that papers in a technically unsuitable form will be returned for retyping. After returned the manuscript must be appropriately modified. How could a bat be able to hit the ball well if he lacked strength, good arm muscle power. So the result will not be able to bounce so far out of the field. If the blow is weak then the ball will be easily anticipated by the opposing player so he will easily be turned off before reaching the base. Then hand eye coordination and reactions in swinging the bat are also indispensable for a batter to be able to determine when the time is right for him to hit the ball thrown by the pitcher.

In the upper throw there are also some physical conditions that may affect the throwing of such softball athletes as arm muscle explosiveness, hand eye coordination, and precision are needed to produce precise and accurate throws. If a softball player does not have good muscular explosive power then the result will not have enough speed to turn off the runner going to the base. Accuracy is also required in this case so that the throw in the produce does not deviate from the target so it will not be difficult for his team mates to catch the

ball. Because if the throw does not have speed and accuracy, then the runner will very easily advance to the next base safely. However, if you have a throwing speed and a good accuracy it will be very easy in turning off opponent runners. In addition, every player in the team must also have the ability of the physical condition in order to make the right throw and quickly to turn off the other runners before reaching the base point.

However, anatomical physical factors should also not be ignored. The anatomical factor or commonly said as a posture also provides its own advantages in sports. The selection of athletes to pursue a sport is not independent of these factors. The ideal body shape in accordance with the exercise is one of the conditions that can affect the achievement of sport. [1] states "One aspect to achieve achievement in sports is a biological aspect that includes the structure and posture that is the height and length of limbs, large size, width and weight, and somatotype (body shape) ". A comparison of the length of the body parts to the height of each of these animals or briefly is called the anthropometric size ratio, which can provide relative value for each individual that can be compared with other individuals. Different height and arm factors can affect the outcome of the throwing and hitting skills of each individual in the softball game.

II. MATERIALS AND METHODS

This research was conducted on campus of University of Riau Sports Education and Venue Softball Rumbai. The sampling technique using proportional random sampling is the method of sampling from the population with random, so that each member of the population is entitled to be a sample. The sample in this research is some of the students in sport education of University of Riau who have never followed softball recovery amounted to 100 people.

The method used in this research is correlational research with confirmatory factor analysis design that is confirm the correlation of indicator variable with latent variable that determine skill upper skill and skill hit on softball. The collected data is then verified and tabulated to be quantitatively processed by: multivariate statistical factor analysis using SPSS computerized software so that it can be reduced to several factors only. Calculates the average donation value of each factor on the latent variable and the dependent variable. Describes the value and position of the average score of the dominant variable in the transformation of the importance-performance matrix.

The data analysis used in this research is Confirmatory Factor Analysis Technique which is a factor analysis technique which a priori based on known and predetermined theories and concepts [1]. The data will be processed using computerized statistic program with SPSS (Statistical Product and Service Solutions). According to [3] the confirmatory factor analysis technique is exactly the same as the exploratory factor analysis technique by calculating the loading factor or the coefficient of factor or lamda value (λi) similar to the regression coefficient value of βi ie the loding factor between the Xi indicator and the formed Fi factor . If the value of loading factor or lamda value (λi) obtained is greater than or equal to half ($\lambda i \geq 0.5$) or can be tested by t test, and if the variable indicates significant value means Xi variable or instrument or item is legitimate to serve as member of the factor in question. The steps in conducting confirmatory factor analysis in this study are as follows:

1. Test Prerequisite Analysis

Prior to the process of data analysis usingfactor analysis methods, first performed some prerequisite statistical test are:

a. Normality test

Normality test in this study using One-Sample Kolmogorov-Smirnov Test method, processed using statistical computing software SPSS

b. Linearity Test

This test is used to see if the model specifications used are correct or not. The functions used in an empirical should be linear, squared or cubic. To test the linearity of regression in this study using the function "Compare Mean", processed using SPSS statistical computing software.

Factor Analysis and Hypothesis Testing

Factor analysis in this study is used to explain the relationship between a number of changes that are mutually independent from one another and to know the dominant factors in explaining a problem. In this study the independent variables analyzed to determine the dominant factor of skill determinants of top and hit skills are height, arm length, arm muscle power, hand eye coordination, balance, and reaction time. Hypothesis testing in this research is done by finding the correlation coefficient of each predictor, the regression equation Y on each predictor variable, the regression equation Y over all predictor variables together with multiple correlation coefficient. The calculation in testing the hypothesis as follows:

a.Kaiser-Meyer-Olkin and Bartlett's test of sphericity
b.Anti-image correlation test
c.Total variance explained test
d.Communalities or role factors
e.Component matrix (factor compiler dimension)
f. Component score coefficient matrix or factor dimension coefficient factor.

III. RESULT AND DISCUSSIONS

Factor analysis in this study was used to compile the factors of a set of variables that were considered feasible to be analyzed. The measurement sub-variable was determined long before the analysis was performed. Anthropometric factors are formed from height, and arm length while the physical factor is formed from arm muscle power, hand eye coordination, balance, and reaction time. The analysis to be used is R Factor to see the correlation between sub-variables, after obtained value from R factor then conducted Data Reduction to generate new variable covering several variables, from 6 variables become the dominant factor of skill skill determinant and hitting skill will tested whether everything becomes an important variable or only a part of which is feasible to be analyzed and grouped into the main factors. However, before

analyzing the data using factor analysis method, it is necessary to perform a preliminary analysis test.

The magnitude of the correlation between the independent variables measured has a value between 0 and 1, to indicate a strong relationship the required KMO-MSA number should be ≥ 0.5 with an opportunity value (Sig.) Should be <0.05. This shows that the collection of variables in this study is significant and can be further processed. Further data will be processed and processed by looking at the magnitude of partial correlation between two variables with still include all variables. This detection is done by looking at Anti Image Correlation resulting in Measure of Sampling Adequacy (MSA) value between 0 to 1. If MSA = 1 variable can be predicted without error by other variable, if MSA> 0.5 variable can still be predicted and can be analyzed further and when the MSA <0,5 then the variable must be eliminated and can not be further analyzed or removed from the set of other variables.

The results obtained Kaiser-Meyer-Olkin Measure of Sampling Adequacy abbreviated KMO-MSA and Bartlett's Test of Sphericity. The result of KMO-MSA test on 6 tested variables was obtained 0.620> 0.5 while Bartlett's Test of Sphericity showed Approximate Chi-square number of 82.2227 with Degree of Freedom (df) 15 and significance 0.000. The magnitude of the correlation between the independent measured variable has a value between 0 and 1, to express a strong relationship the KMO-MSA number should be above 0.5 and with the probability value (Sig.) Should be <0.05. This shows that the collection of variables in this study is significant and can be further processed.

TABLE 1. RESULT KMO AND BARTLETT'S TEST ANALYSIS ANTHROPOMETRIC FACTOR AND PHYSICAL CONDITION DOMINANT DETERMINANTS OVERHEAD THROWS AND BATTING SKILLS IN SOFTBALL

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.620
Bartlett's Test of Sphericity	Approx. Chi-Square	82.227
	Df	15
	Sig.	.000

In the Anti Image Matrices correlation table 2, there are two variables that have MSA values below 0.50 each are height (0.315), and reaction time (0.417) which should be reduced again and must be eliminated or eliminated because it is not significant for further test.

The next step is to reduce the variable with factor analysis II by excluding the variable height and reaction time because in the first analysis step both have MSA value below 0.5 which means that factor is not eligible to be included in factor analysis II.

After performing the prerequisite factor analysis test, the next step is to test the advanced factor analysis by reducing or eliminating the factors that have MSA values below 0.5, ie height (0.315), and reaction time (0.417).

TABLE 2. RESULT ANTI-IMAGE MATRICES CORRELATION ANALYSIS ANTHROPOMETRIC FACTOR AND PHYSICAL CONDITION DOMINANT DETERMINANTS OVERHEAD THROWS AND BATTING SKILLS IN SOFTBALL.

Anti-image Correlation	Height	Arm lenght	Power arm muscle	Hand eye coordination	Balance	Time reaction
Height	**.315**[a]	-.494	-.311	.021	.004	-.117
Arm lenght	-.494	**.652**[a]	-.173	.025	-.064	.005
Power arm muscles	-.311	-.173	**.685**[a]	-.056	-.096	.105
Hand eye coordination	.021	.025	-.056	**.732**[a]	-.180	-.165
Balance	.004	-.064	-.096	-.180	**.535**[a]	.247
Time reaction	-.117	.005	.105	-.165	.247	**.417**[a]

a. Measures of Sampling Adequacy (MSA)

From the table 3, the results of second factor analysis obtained Kaiser-Meyer-Olkin value Sample Sufficiency Measurement (KMO-MSA) and Bartlett Test against Sphericity to 4 exact variables obtained value 0.661> 0.5 while Bartlett's Sphericity Test score shows the number of Estimated Values Chi-square 70,459 with Level of Freedom (df) 6 and significance level 0,000. The magnitude of the difference between the independent variables that have a value between 0 to 1, to indicate a strong relationship KMO-MSA numbers should be above 0.5 and with the opportunity value (Sig.) Must be <0.05. This suggests that the set of variables at this point is significant and may lead to further. From the table above, the results of second factor analysis obtained Kaiser-Meyer-Olkin value Sample Sufficiency Measurement (KMO-MSA) and Bartlett Test against Sphericity to 4 exact variables obtained value 0.661> 0.5 while Bartlett's Sphericity Test score shows the number of Estimated Values Chi-square 70,459 with Level of Freedom (df) 6 and significance level 0,000. The magnitude of the difference between the independent variables that have a value between 0 to 1, to indicate a strong relationship KMO-MSA numbers should be above 0.5 and with the opportunity value (Sig.) Must be <0.05. This suggests that the set of variables at this point is significant and may lead to further.

TABLE 3. RESULT KMO AND BARTLETT'S TEST ANALYSIS ANTHROPOMETRIC FACTOR AND PHYSICAL CONDITION DOMINANT DETERMINANTS OVERHEAD THROWS AND BATTING SKILLS IN SOFTBALL

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.661
Bartlett's Test of Sphericity	Approx. Chi-Square	70.459
	Df	6
	Sig.	.000

In the table 4 Anti Image Matrices tabulation there is no variable that has MSA value below 0,50 which means that all

variables can be tested further using extraction process with Principal Component Analysis method that yields value of Communalities.

TABLE 4. RESULT ANTI-IMAGE MATRICES CORRELATION ANALYSIS ANTHROPOMETRI FACTOR AND PHYSICAL CONDITION DOMINANT DETERMINANTS OVERHEAD THROWS AND BATTING SKILLS IN SOFTBALL

Anti-image Correlation	Arm lenght	Power arm muscle	Hand eye coordination	Balance
Arm lenght	**.680**[a]	-.497	-.174	-.064
Power arm muscles	-.303	**.623**[a]**.**	-.174	-.134
Hand eye coordination	-.303	-.497	**.741**[a]	.035
Balance	.035	-.064	-.134	**.660**[a]

a. Measures of Sampling Adequacy(MSA)

From the table 5 can be seen the initial value and extraction value. The initial value reflects the role or contribution if compiler variable factors individually form these factors, while the results comunalities for each variable is in the extraction column. The extraction value describes the percentage of roles or contributions of each dimension or sub-variable of the factor factors individually to the factor. It also means the number in the extraction column shows the percentage of rotated component matrix. From the table above it is known that the role of the largest dimension is the hand eye coordination sub-variable, with a value of 0.701 or 70.1% and the smallest is arm muscle power with a value of 0.565 or 56.5%. Then to know the donation of each variable on each component, need to do the rotation process that produces Matrix component.

TABLE 5. RESULT COMMUNALITIES ANALYSIS ANTHROPOMETRIC FACTOR AND PHYSICAL CONDITION DOMINANT DETERMINANTS OVERHEAD THROWS AND BATTING SKILLS IN SOFTBALL

Variable	*Initial*	*Extraction*
Arm lenght	1.000	.669
Power arm muscles	1.000	.565
Hand eye coordination	1.000	.701
Balance	1.000	.576

Extraction Method: Principal Component Analysis.

Based on the results of Component Matrix table 6. Analysis of anthropometric factors and physical determinants of top-throwing skills, it turns out there is a component factor has a value of ≥ 0.5 that is the display of arms, arm muscle power, hand eye coordination and balance. This means that the dimensions of the anthropometric and physical factors comprising the variable arm length, arm muscle power, hand eye coordination and balance are members of the anthropometric variable factors and the physical condition of top throwing skill and hitting skills.

TABLE 6 . RESULT *COMPONENT MATRIX*[A] ANALYSIS ANTHROPOMETRIC FACTOR AND PHYSICAL CONDITION DOMINANT DETERMINANTS OVERHEAD THROWS AND BATTING SKILLS IN SOFTBALL

Variable	Component
	1
Arm lenght	**.818**
Power arm muscles	.751
Hand eye coordination	**.837**
Balance	.775

Extraction Method: Principal Component Analysis.

Hypothesis testing is basically a step to test or find out the truth whether the null hypothesis (H0) proposed at a certain level of significance / degree of belief is rejected and the alternative hypothesis (Ha) is accepted, or otherwise the null hypothesis (H0) is accepted and the alternate hypothesis (Ha) is rejected .To know this, in this study hypothesis testing obtained by looking at the value of the results of calculation of Anti-image Matrices Correlation and matrix components. Based on the hypothesis that has been proposed and the calculation of statistical factor analysis has been done then the results of hypothesis testing of this study are:

1. Height determines overhead throws and batting skills in softball

   Based on the value of anti-image matrices correlation contained in table 2. factor of arm length has an MSA value of 0.315 or <0,5 thus height is not feasible to be a member of the factor and must be eliminated from the follow-up analysis, which means the height of the body is not a member of factor anthropometry determinant of overhead throws andbatting skills in softball (H1 rejected)
2. ArmLength determines overhead throws andbatting skills in softball

   Based on the value of anti-image matrices correlation contained in table 2 factor of arm length has a value of MSA of 0.680 or> 0.5 with the value of communalities in table 4.7 of 0.669 which means that the length of the arm has a percentage of the role of the factor of 66.9% and the value of the component matrix of 0.818 which means the length of the arm is a member of the anthropometry factor determining the skill of overhead throws andbatting skills in softball (H2 accepted)
3. Power arm muscle determines overhead throws andbatting skills in softball

   Based on the value of anti-image matrices correlation contained in table 2 power factor arm muscle has a value

of MSA of 0.623 or> 0.5 with the value of communalities in table 3 of 0.565, which means that arm muscle power has a percentage of the role of factors by 56.5% and the value of the component matrix of 0.751 which means the arm muscle power is a member of the physical conditioning factor determining the skill of overhead throws andbatting skills in softball (H3 accepted)

4. Hand eye coordinationdetermines overhead throws andbatting skills in softball

   Based on the value of anti-image matrices correlation contained in table 2 hand eye coordination factor has a value of MSA of 0.741 or> 0.5 with the value of communalities in table 3 of 0.701 which means hand eye coordination has a percentage of the role of the factor of 70.1% and the value of component matrix of 0.837 which means hand eye coordination is a member of the anthropometry factor determinant of overhead throws andbatting skills in softball(H4 accepted)

5. Balance determines overhead throws andbatting skills in softball

   Based on the value of anti-image matrices correlation contained in table 2 balance factor has an MSA value of 0.660 or> 0.5 with the value of communalities in table 3 of 0.576, which means the balance has a percentage of the role of the factor of 7.6% and the value of component matrix of 0.575 or> 0.5 which means the balance is a member of the physical condition factor determining the skill of overhead throws andbatting skills in softball (H5 accepted)

6. Reaction time determines overhead throws andbatting skills in softball

   Based on the value of anti-image matrices correlation contained in Table 2 the reaction time factor has an MSA value of 0.417 or <0.5 thus the reaction time is not feasible to be a member of the factor and must be eliminated from further analysis, which means the reaction time is not a member of a factor anthropometry determinant of overhead throws andbatting skills in softball (H6 rejected).

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IV. CONCLUSION

Based on the results of the analysis, all of the anthropometry factors and the dominant physical conditions that became the determinants and not on the skills of overhead throw and batting in softball can be summarized as follows: The anthropometric factors and the dominant physical condition determine the skills of the overhead throw and batting skills on the softball game arm length with component value matrix 0,818, arm muscle power with component value matrix 0,751, hand eye coordination with value 0,837 and balance with component value matrix 0,775. While the factors that do not determine the height and reaction time

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Effect 1 Vs. 1 Continous Game Against Learning Outcomes Dribbling And Controlling in Football

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***Abstract*— 1 Vs. 1 continuous is a game model in football with a one-on-one player, the first player to dribbling and control the ball and the second player as the opponent who becomes the shadow to seize control of the ball from the first player. The purpose of this study is to find information from existing problems, to 1). Know the effect of game 1 vs. 1 continuous to dribbling learning outcomes. 2). know the magnitude of game influence 1 vs. 1 continuous to the dribbling learning outcomes. The type of research used is quasi-experimental research with quantitative approach. The result of this research is t-test significant value on t count (0.00) <t table (0.05) means Ha is acceptable and there is a significant influence of application of 1 vs. 1 continuous game to dribbling learning outcomes. The amount of percentage improvement is on the learning result of dribbling equal to 10.65% and on the result of a study of controlling equal to 6.02%.**

Keywords : small side games, dribbling, controlling, learning outcomes

I. INTRODUCTION

The quality of a country depends on the education taken by the community in life. Every human being is entitled to get education from various levels, especially school education. Primary to senior high school level there are subjects of physical education. "Physical education is the process of education through physical activity, games or sports selected to achieve educational goals [9]. Physical education is an educational process that gives priority to physical activity that is fun and healthy for learners. A good physical education teacher must understand the topic to be conveyed to the students, and it is also important to develop a lesson plan so that the topic is not out of the discussion and in accordance with the learning objectives. Learning model is a way for teachers to organize teaching and learning activities to run in accordance with the expected goals. According to [4] "learning model is a form of activity that describes the teaching and learning activities from beginning to end are presented in a typical by the teacher." In order for the topic to be delivered teachers can be delivered to the maximum and can be received well by students, the teacher should be able to apply the learning model that can improve student learning outcomes. Student learning outcomes are said to be good if one indicator of the learning model applied by teachers can be accepted by students. "In the learning process students follow a series of teaching and learning process to get the value obtained from the learning process. learning outcomes during the learning process. Football is a sport game that requires teamwork from all aspects to the expected goal can be achieved. To achieve a good teamwork requires players who can master a variety of basic techniques and skills to play soccer, so it can play the ball in all positions and situations quickly, precisely, and carefully means not to waste energy and time. This is in accordance with the opinion expressed by [2] "because working in teams and thereby engaging an environment and context closer to real life increases students critical thinking skills and supports their ability to put theory into practice. In a group must have one goal that produces an opportunity to achieve a goal. This is in accordance with the opinions expressed by Vilar, Luis, et al [13] "Successful performance in team sports like soccer is influenced by the ability of players to identify opportunities for actions from their spatial temporal relationships with other players (both teammates and opponents) and key task constraints (such as the location of the sidelines, goal and ball)." By applying the game model is expected to improve student learning outcomes, especially dribbling and controlling topics. Dribbling is one of the techniques of playing in football. Football is often included in physical education learning because soccer is a simple and easy game to play by students, in the sport there are many elements of character education contained in it including student co-operation. Football is one of the mediators to educate in order to become an intelligent, skilled, honest, and sportsman. At football matches, it can be seen the field stars show dribbling techniques used to pass the opponent and prepare the space to easily pass the ball to a friend. Basically dribbling is kicking discontinuously or slowly, therefore the foot used in dribbling equals the foot used to kick the ball. Dribbling aims, among others, to approach the distance to the target, through the opponent, and inhibit the game. According to [6] "the teacher is a component in teaching that plays an important and important role, because the success of the teaching and learning process is determined by the teacher's teaching model." One of 64 game models in football that leads to sub dribbling topic and controlling class

X is 1 Vs 1 continuous. Controlling / controlling the ball is a technique that must be mastered by every football player. According [3] explains bawhwa "techniques in receiving the ball there are two kinds of balls that are directly stopped (stopping) and receive the ball in the sense of controlling the ball (controling). Basically controlling is done so that players easily control the ball so it is not easy to seize the opponent. Controlling is divided into ie when the ball is flat (rolling over the ground) and at the moment the ball bounces. In learning football sub-meteri controlling on class X is divided into three namely using the inner legs, using the outer legs and soles of the feet.

The purpose of the learning process is an increase in student learning outcomes. According [10] defines that "learning outcomes in students is a change of behavior as a result of the learning process that includes cognitive, psychomotor and affective learning outcomes." Learning outcomes are a result of judgment obtained by students during the learning process. With the results of learning can also be used as an evaluation topic for teachers. How to measure student learning outcomes is to provide tests for students. To find out and measure the learning outcomes that students get during the learning process, the teacher gives the test. According to [5] "the test is a systematic procedure created in the form of tasks standardized and given to individuals or groups to be worked on, answered, or responded to, in written form, oral or deed."

The game is not only needed in the age of the children, but the game is also needed during adolescence because with the game besides making fun also can strengthen solidarity and sensitivity to each other. With the game can increase the motivation of students and can build positive ideas. The same is also stated by [1] "Games provide a natural motivation," the game provides a natural motivation, is the right part in teaching the strategy, and the many benefits that can be used that is to help build a concept of thinking. So the game is a fun activity and as a means of socializing with the surrounding environment and can increase motivation and foster positive values such as cooperation, responsibility, honest and sportsmanship. In learning the students are expected to practice what is directed by the teacher, so the problems that arise can be minimized. There is no possibility that any learning gets difficulties in the learning process. Therefore, teachers should have the ability to use learning models that are appropriate to the conditions in the school. The model can guarantee flexibility to enable a person who uses a particular model to make adjustments to the situation or condition better. So the researchers tried to find a suitable model for learners, from some learning models used in PJOK including small side games. The 1 Vs 1 continuous game model is one of the Small Sided Soccer Games (SSG) game models prioritizing game variations. According to [8] "SSG has the characteristics defined by factors that offer multiple possibilities of variation. Several studies have analyzed the effect of modifying the number of players, pitch size, exercise duration, coach encouragement, rule changes, ball contacts and different periods of play on the physiological demands of soccer. SSG has characteristics and factors that offer many variations. Several studies have analyzed the effect of modification of the number of players, field size, duration of training, support from coaches, regulatory changes, contact with balls and different types of games about physiological soccer game

Characteristics of the SSG game is a football game model that in the implementation can adjust to existing conditions in the field including the number of players, rules of the game, field size, game duration, contact with the ball, and changes in different types of games. The purpose of this study is to find information from the problems that exist in the formulation of the above problems. 1). To know the effect of 1 Vs 1 continious game on dribbling learning outcomes and controlling soccer on students of class X IPA 1 Senior High School 16 Surabaya. 2). To know the magnitude of game influence 1 Vs 1 continuous to learning result dribbling and controlling soccer in student class X IPA 1 in Senior High School 16 Surabaya.

II. MATERIALS AND METHODS

In this research type of research used is quasi experimental research with quantitative approach. This quasi-experimental research is a type of experimental research whose requirements are not satisfied in pure experimental research, such as controlling variables, control groups, treatment or manipulation of activities and test results. Among the four requirements, the study did not use a control group so it was called pre experiment. According to [11] "called quasi experiments because there is no characteristic equation (random) and no control of variables." The design of this study was by using One Group Pretest - Posstest Design because there was only one sample group and did not use the control group. According [12] explains that in the design model of this study, the group was not randomly or coupled, nor was there a comparison group, but was given preliminary and final tests in addition to the treatment. In a study there were populations and samples. "Sampling is the process of selecting a sufficient number of elements from the population, so that 1 out of 10 classes of class X with the number of each class between 30-40 research students on the sample and an understanding of the nature or characteristics will allow us to generalize the nature or characteristics is on the population element "[7]. In this research the sampling technique using simple random sampling. In conducting instrument research is needed for researchers to determine the success of treatment given to the subject of research. According [10] explains that "The research instrument is a tool to measure tests in a study. The research instrument is a tool used to measure both natural and social phenomena being observed. "In this study the instrument used is a zig-zag test.

III. RESULT AND DISCUSSIONS

Analysis of the results of this study will be described with descriptive results of the results of hypothesis testing. Descriptive data to be presented in the form of data from learning result of Physical Education dribbling topic and

controlling of soccer before and after given game 1 Vs 1 continuous at student of class X IPA 1 Senior High School 16 Surabaya obtained from pre- test and post-test experimental group. As for the sample of research that is class X IPA 1 with the number of students as much as 36 students, but at the time of taking data of students who follow the pre-test, treatment 1, treatment 2 and post-test only amounted to 24 students. In the description of this data will discuss the average value, standard deviation, variant, the highest value and the lowest value of the average pre-test and post-test treatment group about the effect of 1 Vs 1 continuous game on learning outcomes dribbling and controlling soccer. Based on the results of the above data it can be seen the average value of pre-test dribbling is 70.40 with standard deviation of 3.11 variant of 9.68, the lowest value of 66.70 and the highest value of 75.00. While in the post-test data the average value is 77.90 with a standard deviation of 2.50, a variant of 6.23, the lowest value of 72.90 and the highest value of 81.20. In the pre-test controlling the average score was 73.38, with the standard deviation of 2.86, the variance of 8.16, the lowest score of 69.00, the highest score of 78. While in post-test controlling the average value was 77.80, with a standard deviation of 2.84, a variance of 6.23, the lowest score of 72, the highest score of 83. the difference between the pre-test and post-test dribbling for the mean is 7.5, the standard deviation difference between the pre-test and the post-test is 0.61, the variance difference between the pre- and post-test values of 3.45, the lowest difference between the pre-test and the post-test. So from the result of the data can be seen big increase between pre-test and post-test class X IPA 1 that is = 10,65%. While on controlling result the difference between pre-test and post-test average value is 4.42, deviation standard difference value between pre-test and post-test is 0,02, varian difference value between pre-test and post- test of 1.93, the minimum difference between the pre-test and the post-test is 3, and the maximum difference between the pre-test and the post-test of 5. So from that result can be seen the increase between pre-test and post- test that is 6.02%.

First pre-test research process consisted of 3 aspects of the test such as affective using attitude assessment, cognitive observation by answering 4 items essay, and psychomotor dribbling with zig-zag test and controlling with judgment expert. Pre-test is done during teaching and learning activities that is 3x45 minutes. In the process of implementing all three test items, students are accompanied by researchers and students explained about the rules and how to perform the three test items. In the implementation of psychomotor tests students follow the zig-zag test for dribbling and judgment expert skills for controlling skills look enthusiastic but still difficult to do controlling and dribbling because students have not been able to master the motion of the ball. At the second meeting, the students who followed the treatment of 33 students with 2 sick students and 1 without information. This second meeting uses 3 games of 1 Vs 1 continuous 1 Vs 1 continuous 1-goals, 1 Vs 1 continuous 2-goals and 1 Vs 1 continuous 4-goals which each game is held for 25 minutes and divided into 2 small groups in every game. With the division of the group is expected to facilitate researchers to supervise the course of the game. Overall the students still look confused in the game because previously never had a model of group competition game played individually is one on one person..

IV. CONCLUSION

This discussion will discuss the declaration of the effect of 1 Vs 1 continuous game on the learning outcomes of dribbling and controlling in soccer in students of class X IPA 1 in Senior High School 16 Surabaya. In this study, researchers apply the learning model in the form of the game is expected to improve student learning outcomes, especially on soccer learning topics that is dribbling and controlling that is by applying the game 1 Vs 1 continuous. In the research process, the first meeting conducted pre-test consisting of 3 aspects of the test such as affective using attitude assessment, cognitive observation by answering 4 items essay, and psychomotor dribbling with zig-zag test and controlling with judgment expert. Pre-test is done during teaching and learning activities that is 3x45 minutes. In the process of implementing all three test items, students are accompanied by researchers and students explained about the rules and how to perform the three test items. In the implementation of psychomotor tests students follow the zig-zag test for dribbling and judgment expert skills for controlling skills look enthusiastic but still difficult to do controlling and dribbling because students have not been able to master the motion of the ball.

Students are given treatment by using 3 kinds of 1 Vs 1 continuous game that is 1 Vs 1 disguiuse (spotters), 1 Vs 1 lose defender, and 1 Vs 1 random. In this second treatment the game model level is more difficult than the previous game model. Just like the second meeting, each game is held for 25 minutes and is divided into 2 small groups in each game. Differences seen in the third treatment, students look enthusiastic and more active in the game activity because it can mempamahi rules and how to play games. Differences are seen in the post-test with pre-test performed earlier. In psychomotor test zig-zag test for dribbling skill test and judgment expert for test of student's controlling skill, there is a change in motion control. In the pre-test students are still difficult to control the movement of the ball and the body is still less relaxed, but in this post-test students are accustomed to control the motion of the ball and the body can relax.

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Effect of Plyometric Tuck Jumps and Lateral Hurdle Jumps on the Ability of Takraw Male Athletes to Do Smash Kedeng

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***Abstract*— Smash Kedeng is important to get points in Takraw's game, but it's very difficult to do. Therefore, it is necessary to develop appropriate training. This study aims to examine the right exercise to improve smash Kedeng ability. This experimental research used sample of 20 male athletes using two independent variables: plyometric tuck jump and lateral hurdle jumps, and one dependent variable: ability of Smash Kedeng. Data were analyzed with t-test. The result was lateral plyometric exercises hurdle jumps are better than tuck jump exercises for the ability to smash Kedeng.**

Keywords— Plyometric, Tuck Jump, Lateral Hurdle Jumps, Smash Kedeng Introduction

I. INTRODUCTION

Takraw is a game that uses the skill of the foot to play the ball. This game is performed by two squads on the field as wide as a badminton court. Each team consists of three players. In order to play sepak takraw, one is required to have basic skills or skills consisting of kicking with the legs, playing the ball with the head, with the thighs, shoulders and soles of the feet. Mastery of sepak takraw skills can be individual skills, and matching skills[1]. Individual skills include: *sepak sila, sepak kura, sepak badek, sepak cungkil, memaha* (thigh control), *mendada* (chest control), and heading, while the skills to master the game include: *sepak mula* (service), receiving the ball, feeding, smash and block. Smash in takraw is a special technique that must be controlled by all players, especially the players in the position *apit kanan* and *apit kiri*. Smash in takraw has a higher difficulty level compared to other techniques. Smash is one of the most important attack techniques and is a very decisive series of motion in the game sepak takraw (Winarno, 2011, p. 6)[2].

Smash kedeng is a smash done with the feet. The players, *apit kiri* and *apit kanan* have many opportunities to do smash *kedeng*. For that, to have an ability to attack the opponent team, players need to have a good smash ability (Darwis & Basa, 1992, p. 69)[3]. Sometimes a player jumps ahead of the ball, so when the ball blow has not reached within the range or the ball has dropped first, so the player fails to smash the ball or ball stuck on the net.

Smashes require physical abilities including: speed, agility, strength, thunder, leap and foot blow on the ball to do smash. To produce the maximum smash, it need appropriate method to increase the precision and accuracy. In other words the right method could improve the ability of smash on takraw's athletes (Annas, 2014)[4].

Speed will affect the movement of smash *kedeng*, because this physical ability is an important for athletes. Smash can be done with the shortest time possible. To do smash *kedeng*, the athlete must also have the Power. Power is the result of multiplication between strength and speed. To increase the power of the athlete it takes strength and speed training (Sukadiyanto, 2011)[5]. It's an ability to move the body and its parts without feeling the tension on the articulations and muscle pairs. Athletes who have a good level of flexibility will be able to smash *kedeng* perfectly. In addition to the flexibility, the balance is necessary to do smash *kedeng*, especially to maintain posture when doing smash *kedeng*. If the balance is good, the player wouldn't fall easily when doing the movement of smash *kedeng* during the game.

Plyometric is an exercise or repetition aimed at connecting the movement of speed and power to produce explosive movements. Plyometric exercise can result in strong muscle contraction with very rapid movement (Chu, 1991, p. 1)[6]. Plyometric is a form of training to achieve explosive power for all sports activities. Explosive power is the power of the muscle movements performed at high speed (Bompa, 1994). Plyometric is associated with exercises that are strong and rapid muscle contractions in response to the speed of dynamic changes and stretching of the muscles involved. The plyometric exercises in question are barrier hops, depth jump, multiple box-to-box jumps, stadium hops, single leg stride jump, skipping, tuck jump and lateral hurdle jumps[7]. These types of exercises can improve the speed, agility, balance,

power and flexibility of a player when done in earnest and progressively practiced progressively.

Tuck jump exercises and lateral hurdle jumps, a form of training that will be given to the male athlete Takraw to increase muscle limb power in the athlete while performing smash ability kedeng. Both of these exercises using leap leg strength, but in the form of exercise tuck jump leap and lateral hurdle jumps are different. Each of both exercises, has advantages and disadvantages, but it is not known which exercise has a great impact on improving the ability of smash kedeng at male athlete takraw at Club Padang Jagad. Not all athletes have good physical ability in doing smash *kedeng*. Only a small number of takraw's male athlete in Club Padang Jagad having the ability to do a good smash *kedeng*. Therefore, it is necessary to examine what factors influence the achievement of male athlete takraw Club Padang Jagad either from coaching, implementation of practice, methods applied and otherwise.

Based on the problems that have been stated, takraw's male athletes at Club Padang Jagad still have weaknesses in the physical ability of both the leap, impact, speed, flexibility and balance when performing smash ability so that smash punch produced is not maximal. The purpose of this study were: 1) to analyze the effects of exercise plyometrics tuck jump on ability of smash *kedeng* on takraw's male athletes, 2) to analyze the effects of exercise plyometrics lateral hurdle jumps on ability of smash *kedeng* on takraw's male athletes, and 3) to analyze the exercise appropriate between plyometric tuck jump and lateral hurdle jumps on the smash ability of takraw's male athletes.

II. MATERIALS AND METHODS

This research use experimental research method with design Matched by Subject Design. The population in the study were 26 takraw's male athletes at Padang Jagad Club of Demak Regency in 2017. Samples used are 20 athletes, using a purposive sampling technique, male athletes who have good mastery of smash techniques. The sample was tested with vertical jump test, then divided into 2 groups with the same ability using matched subject ordinal pairing technique, with the aim of balancing the two groups before doing the treatment in research using ABBA formula. The sample was divided into 2 groups of Experiment 1 and Experiment Group 2, Experiment Group 1 group was given plyometric tuck jump training and Experiment 2 group was given lateral hurdle jumps practice. The research instrument used there are 2 kinds, namely 1) Test vertical jump and 2) Test of Kedeng smash ability. The exercise was done in 14 times with the training program that has been made adapted to the ability of athletes. Afterwards, do the final test with the test of Kedeng smash ability, 10 time. The data of the research were analyzed using t-test statistic to know the effect of the difference.

III. RESULT AND DISCUSSION

Plyometric exercises in some studies show their effectiveness to improve agility, muscle formation and strength or power. Plyometric training has evolved into a widely accepted and greatly effective tool to improve power and agility. Athletes of all ages and skill levels can safely perform plyometric exercises[7]. Plyometric training can be an effective training technique to improve an athlete's agility[8]. Plyometric can improve the production of muscle force and power. In particular, the fast force production of the trained muscle improves, coupled with smaller increases in maximum isometric force[9]. Pyometric training used in this researh was tuck jum and lateral hurdle jumps.

The results of the analysis of research data are presented in Table 1, which can be described as follows:

TABLE 1. DESCRIPTION OF RESEARCH DATA

	N	*Mean*	*Min*	*Max*	*Std. Dev*
Pre-test Vertical Jumps	20	49.00	40	62	6.83
Pre-test Tuck Jump group	10	14.80	11	20	3.28
Pre-test lateral hurdle jumps group	10	16.40	12	21	3.46
Post-test Tuck Jump group	10	18.00	15	23	2.86
Post-test lateral hurdle jumps	10	20.90	16	26	3.47

Based on the result with t-test, experimental group 1 (tuck jump) showed that pretest and posttest were 8.500. Test of significance (t-test) is done with significant level at $\alpha = 5\%$ with db = 10 - 1 = 9. T count is bigger than t table with 8.500> 2.262, it means that alternative hypothesis (Ha) is accepted. These results indicate that there is a significant influence from the results of tuck jump plyometric training on smash *kedeng* ability's at takraw's male athletes in Club Padang Jagad, Demak regency in 2017.

The pretest and posttest data of experimental group 2 (lateral hurdle jumps) was analyzed to determine if there was any difference of effect of athlete smash ability's at Club Padang Jagad Demak Regency in 2017 before and after the lateral plyometric hurdle jumps.

Based on the test results of the influence with t-test statistical analysis, in the experimental group 2 (lateral hurdle jumps) it is known that the pretest and posttest results obtained value of 13.636. Test of significance (t-test) shows that t count> t table with significant level at $\alpha = 5\%$ with db. = 10 - 1 = 9, shows that t count is bigger than t table 13.636> 2.262. It means that the alternative hypothesis (Ha) is accepted. These results indicate that there is a significant effect of the lateral plyometric hurdle jumps on the ability of smash kedeng at takraw's male athlete at Club Padang Jagad Demak Regency in 2017.

The effect of posttest result data on experimental group 1 (tuck jump) and experimental group 2 (lateral hurdle jumps) was done to determine if there is difference of effect of smash

kedeng ability's on athlete of takraw at Club Padang Jagad in Demak Regency in 2017 after doing plyometric training tuck jump and lateral hurdle jumps. The result of calculation of influence test using t-test is presented in the following table.

Based on test result of influence with t-test, posttest result in experiment group 1 (tuck jump) and experiment 2 group (lateral hurdle jumps) obtained value 2.230. Test of significance (t-test) is t count> t table with significant level at $\alpha = 5\%$ with db = 10 - 1 = 9. T count is bigger than t table: 2.230> 2.262. It means that the null hypothesis (Ho) is accepted. These results indicate that there is no significant effect of tuck jump and lateral hurdle jumps on the ability of takraw's male athlete to do smash *kedeng*.

To know which experimental group has an improved percentage of smash capability that can better be known through calculation of the effect of percentage improvement of each group. The results of the value of the effect of enhancing the ability of smash *kedeng* in percent between the experimental group 1 (tuck jump) and the experimental group 2 (lateral hurdle jumps) as follows:

TABLE 2. PRE-TEST, POST-TEST AND INCREASEMENT

	N	*Mean pretest*	*Mean posttest*	*Mean Different*	% Increasement
Experiment group 1	10	14.80	18.00	3.20	21,62 %
Experiment group 2	10	16.40	20.90	4.50	27.42 %

Based on calculation result of percentage of smash upgrading, it is known that experiment 1 group (tuck jump) has an increase of smash ability of 21,62%, while experiment 2 group (lateral hurdle jumps) has 27,42% improvement of smash kepeng capability. It means that the alternative hypothesis (Ha) is accepted. Based on these results, the experimental group 2 (lateral hurdle jumps) has improved the ability of smash *kedeng* better than the experimental group 1 (tuck jump) with a percentage increase of 27.42%.

The results showed that there is influence between tuck jump exercice on the ability of smash kedeng in takraw. Tuck jump is a practice of jumping motion with the knees bent and the foot refusing on the ground to jump and land with a shovel. The plyometric tuck jump exercises will affect the gluteus, gastrocnemius, quadriceps, hamstring, and hip flexors[10]. Similar research shows that the practice of using plyometric jump to box increased on average 1.361 was better than using a double tuck jump plyometric exercise with an average increase of 1,210[11].Tuck jump training exercises hamstring muscle strength because at the time of jumping and the knees bent, hamstring muscle is very dominant in the movement of the lower leg, especially on the back. When performing a leap, hamstring muscle plays an important role to provide power the muscle contraction in a concentric and extrinsic to the maximum with the practice of tuck jump. In addition to the practice of smash kedeng also done to improve the ability of athletes through plyometric training tuck jump both in terms of the speed of discharge and the accuracy of the punch when hitting the ball in the air.

The plyometric exercise can increase leg muscle power by 23% (Suratmin, I Putu Panca Adi, 2016)[12]. An other research mentioned also that there is a difference in the effect between having a high and low limb muscle explosive power to a high limb muscle explosive outcome having greater influence compared to low limb muscle explosiveness in jump results[13].

The results showed that there is influence between lateral hurdle jumps practice on the ability of smash kedeng on athletes takraw. Lateral hurdle jumps are the same exercises as a tuck jump with a jumping motion with the knees bent and the foot refusing on the ground to jump and landing with a shovel, but the leaping direction of this exercise to the side by passing the hurdles as a 45 centimeter high hurdle. Lateral hurdle jumps exercises press on the balance, strength, and speed of leg movement to achieve the highest jump and jump as far as the side. When doing a smash kedeng required balance and speed to jump for smash kedeng can be done well when the ball is fed to the side of a smasher. This is because the lateral plyometric exercise hurdle jumps can improve the ability of the athlete in terms of balance, strength and speed leap to the side. With the ball bait being thrown to the side, the athlete can perform a maximum smash with the maximum and aim the ball into the field.

The result of this research mentioned that there is influence between tuck jump and lateral hurdle jumps on the ability of smash kedeng at takraw's males athletes at Padang Jagad Club of Demak Regency in 2017. Tuck jump and lateral hurdle jumps training on the ability of smash kedeng is (21.62<27.42) then it can be concluded "lateral plyometric practice hurdle jumps are better than plyometric tuck jump exercises. This is because the lateral plyometric practice of hurdle jumps has the advantage of a sideways leaping motion that resembles a smash-like motion. This exercise emphasizes the balance, strength and speed of the leap to the side. This exercise train athletes to do smash kedeng by directing the target ball to the field area.

IV. CONCLUSION

Based on the results of research and discussion in this study it can be concluded that there is an influence between tuck jump exercise on the ability of smash kedeng at takraw's athletes, there is an influence between the lateral practice hurdle jumps on the ability of smash kedeng, and lateral plyometric hurdle jumps is better than the tuck jump plyometric on the ability of smash *kedeng*. From these conclusions can be suggested for trainers or coaches are advised to use lateral training methods hurdle jumps as an alternative exercise to improve the ability of smash kedeng.

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The Palm Date Treatment to Anaerobic Muscle Fatigue on Running Athlete

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***Abstract*—The fitness of an athlete is very important. Running athletes need enormous energy in a short time thereby they should increase the risk of anaerobic muscle fatigue. One of the effort to delay it was by increased of glycogen deposits and potassium intake which indicated to prevent and reduce anaerobic muscle fatigue. Palm date had relatively high content of carbohydrates and potassium. This study was aimed to determine the effect of palm date treatment to anaerobic muscle fatigue index (FI). It was one group pre-post test study design. The subjects were measured by RAST (Running-based Anaerobic Sprint Test) prior before any treatment as a pre-test. After one day rest, subjects received 100 grams of palm date treatment since one hour before RAST as a post-test. Data were analyzed by paired t-test. There was FI significant difference between pre-test and post-test ($p<0.05$). Palm date intervention was significantly prevented anaerobic muscle fatigue.**

Keywords—anaerobe, carbohydrate, palm date, fatigue index (FI), RAST, running athlete

I. INTRODUCTION

Sport achievements has a high value for a country. The fitness of athletes before and during match is crucial to the sport achievement. Therefore, it becomes nutritionists concern in the sport nutrition field in order to improve athletes performance and sport achievement especially for running athletes to reduce the risk of fatigue. A running athlete requires great energy in a short time so the risk of fatigue is an aspect that truly needs attention. However, it is a blind spot that lacks of a serious preventive effort in fatigue management.

There are many terms that were understood by many people as well as the health and sport expert about the definition of fatigue. Physical fatigue can be interpreted as a decrease in work capacity caused by doing certain activity. Decrease in work capacity is decreased in quality and quantity of work or physical movement of a person[1]. While anaerobic fatigue is a muscle fatigue caused by high physical activity of anaerobic type which requiring rapid energy in a short time with the result of high lactid acid concentration in muscle cells[1]. High concentration of lactic acid in muscle cells trigger muscle fatigue that limits muscle ability to do contraction and cause pain[2]. Measument for anaerobic muscle fatigue can be performed using Fatigue Index (FI) parameter via *Running-based Anaerobic Sprint Test* (RAST)[3,4].

One of alternative ways to delay anaerobic muscle fatigue during exercise is by increasing the amount of glycogen deposits of 25-100% derived from carbohydrate consumption before exercise[5]. This effort able to delay anaerobic muscle fatigue by 20%[2]. Macronutrient treatment such as carbohydrate to adult athletes as much as 30-80 grams per hour during sport exercise with duration ≥ 1 hours can increase athletes endurance[6]. Muscle fatigue is also influenced by micronutrient substances, micronutrient studies suggest that increased activity of Na^+, K^+, and ATPase during exercise is able to stabilize the concentration of sodium and potassium in membrane to prevent fatigue[7]. Intervention study of carbohydrates and potassium food sources to athletes was indicated to give a positive effect in reducing anaerobic muscle fatigue[8]. One of high carbohydrate and calium food sources can be found in dried fruits. Palm date as one of dried fruits contains 73 grams carbohydrate and 698 miligrams potassium per 100 grams[9]. Therefore, palm date should be tested to ensure the effectiveness of these high carbohydrate and potassium food sources as anaerobic muscle fatigue prevention on athletes[8,10,11].

II. MATERIALS AND METHODS

Design of this study was *one group pre-post test design*. One group of subjects performed treatment with measurement before and after treatment. Study subjects were members of *Center For Student Development and Training* specifically for *Running Athletic / Pusat Pelatihan Latihan Mahasiswa (PPLM) Atletik Lari*, Sports Science Faculty, Universitas Negeri Semarang age 15-25 years. Samples were taken by simple random sampling and Slovin formula was used to sample calculation.

Subject's inclusion criterias were not taking supplements, vitamins, high-dose minerals, herbs, medications associated with inflammatory reactions or immune function, not under physician care or post-surgery 6 months prior to the study and willing to follow the study through informed consent.

Subjects obligatory to fasting 8 hours before do the Running-based Anaerobic Sprint Test (RAST). On the first day, all of subjects were not given any food treatment then RAST was done as a pre-test. On the second day, subjects took a rest. Palm date treatment were done on third day as a post-test. Subjects received treatment of 100 grams of palm date since one hour before RAST[4].

The RAST was started by warming up approximately 10 minutes with stretching exercises and specific training routines (sprint and light running). It conducted on a straight 35 meters sprint track at each endpoint for escape. The test consisted of 6 sprints at maximum speed covering a distance of 35 meters, with a 10-seconds pause between each trial. Time was manually timed by a researchers, two other researchers were positioned at each extremity of the test area to control recovery time (10 sec)[4].

Peak Power Output (PPO) was calculated by body mass (kg) x distances^2 (meters) ÷ time^3 (seconds). From the six sprint times and PPOs, it can be determined maximum and minimum power output. Then, Fatigue Index (FI) can be calculated by (maximum power output – minimum power output) ÷ total time for the 6 sprints. Data were analyzed using paired t-test[4].

III. RESULTS AND DISCUSSION

A. Subject Characteristics

Subject characteristics were described in Table 1. Subjects had similar age characteristics among others. The youngest subject was 21 years old, while the oldest subject was 25 years old. Body Mass Index (BMI) ranges from 20.03 kg/m2 to 23.91 kg/m2.

TABLE 1. SUBJECT CHARACTERISTIC

Variable	Mean ± SD
Age (year)	22.83 ± 1.10
Weight (kg)	64.47 ± 3.65
Height (m)	1.70 ± 0.03
Body Mass Index (kg/m^2)	22.26 ± 1.12
Total Energy (calorie)	2941.92 ± 909.96
Total Carbohydrate (gram)	259.30 ± 71.95
Total Potassium (mg)	1390.50 ± 362.98

According to Table 2, subjects who suffered fatigue and not fatigue were 3 (30%) and 7 (70%) at pre-test (before palm date treatment), respectively. Whereas, all of subjects at post-test (after palm date treatment) were not suffered fatigue at all.

TABLE 2. SUBJECT DISTRIBUTION BASED ON FATIGUE INDEX

Measurement	Fatigue Index (FI)				Total	Percent
	>10 (Fatigue)		≤ 10 (Not Fatigue)			
	Frequency	Percent (%)	Frequency	Percent (%)		
Pre-test (before palm date treatment	3	30	7	10	10	100
Post-test (after palm date treatment	0	0	10	100	8	100

Table 3 showed that there was a significant difference of Fatigue Index (FI) between pre and post-test measurement ($p<0.05$). Means of FI at pre-test measurement was higher than at post-test. The results of this study indicated that Fatigue Index (FI) was lower at post-test after 100 grams palm date treatment than at pre-test. The result of *Paired t-test* analysis showed that there was a significant difference of FI on both measurements.

TABLE 3. FATIGUE INDEX (FI) STATISTICAL TEST

	Pre-test (before palm date treatment)			Post-test (after palm date treatment)			*p**
	Mean ± SD	Min	Max	Mean ±SD	Min	Max	
Fatigue Index (FI)	7.94 ± 2.91	4.88	13.05	3.82 ± 1.33	2.09	5.48	0.001

Means of FI at post-test measurement was 3.82 ± 1.33, whereas 7.94 ± 2.91 at pre-test. It could be interpreted that palm date treatment reduce FI on athletes moreover it proved the existing hypothesis. FI ≤ 10 categorized that athletes did not experience fatigue, while FI > 10 means athletes were fatigue[10]. *Running-based Anaerobic Sprint Test* (RAST) was one of the tests for measuring anaerobic muscle fatigue that has been widely used because of its validity and reliability. It was more specific for anaerobic muscle fatigue tests in running based sports by looking at the FI[4].

In high-intensity sports activities such running, the body required energy rapidly and nutrient metabolism ran anaerobically. In such a situation, the body produced a side product of lactic acid that caused pain and muscle fatigue when accumulated[2]. Muscle fatigue was a condition that occurred after a strong or long muscle contractions which the muscle's ability to contract was decreased. It occurred for a certain period of time until muscle strength was restored[1].

Anaerobic energy metabolism consists of two systems, phosphocreatine (PCr) and anaerobic glycolysis systems known as the lactic forming system. Creatin (Cr) was a type of amino acid stored in the muscle as a source of energy. Phosphocreatine (PCr) was a form of creatine that already phosphorylated in muscle. It was broken down into *inorganic phosphate* (PI) and creatine by *creatinephospho kinase.* PI bound the *adenosine diphosphate* (ADP) molecule to re-form *adenosine triphosphate* (ATP). High amount of energy (2.3 mmol ATP /kg seconds) could be generated instantly to meet energy requirement for exercise with high intensity by PCr hydrolysis process[1]. However, it could only last about 7-10 seconds while doing the maximum physical activity because limited storage of ATP and *creatine phosphate* (CP).

Another metabolism process was anaerobic glycolysis or known as the lactic forming system. This process used glucose deposits which largely derived from muscle glycogen and blood glucose to produce ATP. Basically, glucose was converted to pyruvic acid with the formation of ATP. Afterwards, pyruvic acid was converted into lactic acid in a limited oxygen condition or the formation of pyruvic acid occurred rapidly. If the supply of oxygen is insufficient, as in vigorously contracting skeletal muscles, the pyruvate cannot be oxidized further for lack of oxygen. The reduction of pyruvate by *Nicotinamide Adenosin Dinucleotide Hydrogen* (NADH) to form lactic acid was catalyzed by *lactate dehydrogenase* which forms the L-isomer of lactate. This condition occurred in severe contracting muscle such running, weighting, push-up, or long jumping. Lactic acid through the bloodstream circulated into the liver. Then, it was converted back into glucose. Glucose was circulated again into bloodstream and entered into muscle cells. Glucose was converted into glycogen which known as *the lactic acid cycle* or *the Cory cycle*[2].

The important nutrients that had a big role for anaerobic fatigue muscle were carbohydrate and potassium. Increased of glycogen storage for 25-100% derived from carbohydrate consumption before exercise was one effort to delay the occurrence of muscle fatigue during exercise. A study showed that this effort could delay muscle fatigue approximately 20% during exercise[2]. Moreover, a meta-analysis study recommended 30-80 grams of carbohydrate intakes to prolong the delay of muscle fatigue [6]. Date palm (*phoenxdactylifera*) was plant that had been known since antiquity, even before humans familiar with agricultural technology. Date palm was a very useful plant especially because of their resistance to high temperature and dry condition, even all of its part can be used for humans need. It was called by "*adagium"* as there were so many benefits of date palm as the number of days in a year[12].

Dried dates had an average water content of 22.5% with an energy content of 1151 Kj, 73.5% carbohydrate, 0.45% fat, 1.9-2% protein, and 7.5% fiber[13]. In every 100 grams of palm date consist of 73 grams carbohydrate, 0.5 grams fat, 3 grams protein, and 3.7 grams fiber[9]. Another study of high carbohydrate food source was a banana treatment to athlete before exercise could significantly prevent muscle fatigue in the anaerobic phase[8]. The larger amount of glycogen reserve in muscle, it took longer time to spend it for activity. It determined muscle fatigue. When the glycogen reserved was run out, then the muscle would experience fatigue[14].

Muscle fatigue was also influenced by micronutrient substances. Micronutrient studies suggested that increased activity of Na^+, K^+, and ATPase during exercise was able to stabilize the concentration of sodium and potassium in membrane to prevent fatigue[7]. Each hundred grams of palm date consisted of 698 mg potassium and 11 mg sodium[9]. Potassium concentration in the intracellular fluid could increase 30-60 minutes after consumption of high carbohydrate and potassium food sources[15]. A study of potassium contained in citrus fruits helped to maintain body fluid and acid balance. In addition, as important electrolyte for nerve impulses in muscle contraction and also maintain blood pressure[16]. Potassium requirement could be obtained from high potassium food sources such palm date, banana, and citrus. Potassium food sources consumption could prevent the occurrence of anaerobic muscle fatigue[8,10].

IV. CONCLUSION

The study result found that there was a significant difference in mean fatigue index (FI) between pre-test (before palm date treatment) and post-test (after palm date treatment). Treatment 100 grams of palm date before exercise could reduce FI on athletes. Carbohydrate intake before exercise could prolong the delay of muscle fatigue. Moreover, potassium intake had a role for micronutrients concentration control in membrane to prevent fatigue.

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Biomechanical Analysis of Snatch Technique in Conjunction to Kinematic Motion of Olympic Weightlifters

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***Abstract*--The snatch requires the barbell to be lifted from the floor to a straight-arm overhead position in one continuous motion (Gordon et al, 2012). The increase of performances is depending on the improvement of proper technique and training methods (Hung-Ta et al, 2010). Determining the effects of barbell weight towards to kinematics profiles is indispensable to find the effective technical factors of successful lifts [15]. To investigated the kinematics motion of angle of ankle, knee, hip, velocity and bar trajectory in two differences weights to performance of snatch. This study used descriptive with retrospective case control method by recording kinematic motion of 6 (six) male olympic weightlifters. The 3 HD cameras (Sony NEX-VG30EH) are installed approx 90º on the frontal, dorsal and sagittal of the platform with 9m distances and analyzed by SIMI Motion Software. The result will be discussed in three parts, the first is various lifting phase, secondly is the compare lifting between success and unsuccessful, and lastly is to compare the outstanding player with the general. Conclusion through kinematic analysis can be used to observe technical insufficiencies that cannot be observed in the real time malfunction, so that the coach can find the problem and create specific exercises more accurately.**

Keywords: kinematic, bar path, angle, weightlifting

I. INTRODUCTION

Weightlifting becomes one of the sports that are expected to contribute to the Olympics in Rio De Janeiro, Brazil 2016. Achievements earned by Indonesia at 2 times 2008 Beijing Olympics and 2012 London are silver medals under Chinese achievement as Olympic gold medalist. Several affecting factors that determine the maximum achievement in weightlifting are mastery of efficient techniques [14]. The snatch is an event in which the lifter lifts the barbell from the platform to locked arms with one smooth continuous movement without stopping, one hand lagging behind or extra pushing above the head.

The lifter usually uses wide grip which enables lifting the barbell faster and higher. One try to lift the barbell from the pull off the platform to the squat does not take more than two seconds, depending on how exact the movement is and the level of muscle work. The lifter usually lifts less weight at the snatch then at the clean and jerk. Bio-motoric component is a critical need to be considered for the sport of weightlifting. In addition to requiring components such as strength, speed and coordination, the explosive power component is one of the dominant factors that are crucial to be able to perform snatch movements perfectly in addition to the required physical components, mastery of the technique is also very necessary to obtain an efficient movement [2].

The review of technique and technical training in weightlifting both in snatch as well as cleand & jerk are highlighted by the following technical elements such as technical procedure, style and basic mechanism form of technical models [1]. The snatch technique requires the barbell to be lifted from the floor to a straight-arm overhead position in one continuous motion and it is the most technical component of a weightlifting competition [9]. The phases of snatch (first pull, transition, second pull, turnover under the barbell, catch phase and rising position) are considered to be the most important phases of the snatch lifts, and increasing the barbell weight has an

important effect on all biomechanical factors during these phases [5, 6].

The snatch begins from the Lift off position, progresses through First Pull, Transition and Second Pull phases to the squat then the finish, or Hold position. The First Pull is from when athlete lifts the loaded barbell from the floor until the bar has cleared knee height. The Second Pull is from when the bar clears the knee and ends with the lower limbs in full extension. During the Second Pull the athlete extends the hips and keeps the bar as close as possible to the body. The Bar Clear is from when the lifter drops under the bar supporting it on extended arms in the full squat position to until the lifter stands [16]. The lift finishes with the bar stable at the Hold position. When the snatch technique is analyzed as a whole, it can be seen that the synchronization and perfection of the system consisting of the body and barbell is the key to a successful lift.

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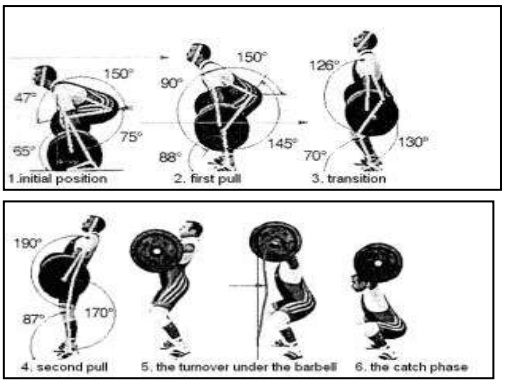

Fig. 1. The Phases of Snatch : (1) the first pull, (2) the transition, (3) the second pull, (4) the turnover under the berbell, (5) the catch phase, and (6) the rising position from squat position.

The performance pattern of the snatch technique requires the barbell to be lifted from the floor to a straight-arm overhead position in one continuous movement [9]. Determining the exact effects of the increased barbell weight on the barbell and body kinematics might help to understand the effective technical factors and the biomechanics of successful lifts of higher weights. Several study explained the Secondary Pull as critical to both the Snatch and Clean lifts as it is considered the highest power phase of both lifts [13], and interpretation of bar kinematics/trajectory could be used as indicative of faults in lifting technique, therefore needed to be considered [4]. From the kinematic point of view, the basic variables to influence the success or failure of a single try are the timing features of individual phases of this movement structure [10]. Then there are the space features, mainly the trajectory of the barbell locomotion, changes of its position by both vertical and horizontal axis, the difference in the maximum reached height and the final height of the barbell [5]. The successfully of snatch is depending on those maximized Pull Height after Second Pull, minimized the loss in height of the bar during the squat through the efficientcy of bar trajectory of kinamatic movement [12].

II. METHOD.

This study was descriptive in nature with Retrospective Case Control methods with the aims was to investigated the kinematics motion of angle of ankle, knee, hip, barbell velocity, bar trajectory as well as bar displacement in two differences weights to performance of snatch. The 3 (three) high definitions cameras (Sony NEX-VG30EH), 60fps are installed approx 90^0 on the frontal, dorsal and sagittal of the platform with 9m distances (fig.2).

It was began with provide informed consent, PAR-Q (physical activity readiness questionnaire) then anthropometrical measurement to 8 (eight) Indonesian male weightlifters team representatives *(2.76±20.96 y.o), body height (4.79±170.03cm), body weight (6.79±70.03kg), body mass index (1.56±21,60), Resting Heart Rate (2.25±74,63 bpm) and Maximum Heart Rate (9.56±202 bpm)*, who compete internationally and conducted as part of the monitoring of athletes preparation for Olimpic Games Rio 2016.

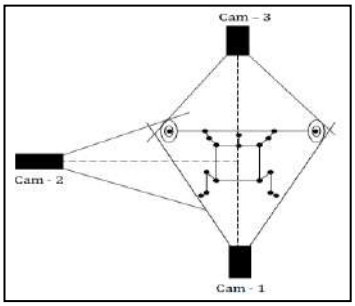

Fig. 2. The camera set-up

The measurement procedure begins with recording of the 6 (six) male Olympic weightlifters by perform 2 (two) times snatch with individual weight of 80% dan 90% from personal best. The snatch lifts were recorded using synchronized 3 HD cameras and the kinematic motion of snatch will be analyzed by SIMI Motion Software.

The study focused on the evaluation of basic time, space, and velocity variables which we can subsequently work with changes in ankle, knee and hip joints, changes of the barbell position in vertical axis as well as the speed of the barbell. This Biomechanical analysis of the Indonesia weightlifters was conducted on the performance of the National Weightlifting Championship at Senayan, Jakarta.

III. RESULT.

Based on the set aim of the work, study focused on the performance evaluation of angle of joints, velocity variables which we can subsequently work with changes in ankle, knee and hip joints, changes of the barbell position in vertical axis, the speed of the barbell and bar trajectory. The difference in angular characteristics of ankle joints measured form knee axis to knee during initial position with two different loads, can be seen from the table and figure below.

TABLE 1. THE DIFFERENCES OF ANGLE DURING INITIAL POSITION

Attempts	Athletes	Angle of Ankle (left)	Angle of Ankle (right)	Time maximal	Angle difference	SD (s)
1 (80% PB)	A-1	79	72	0.571	7.0	2.35
	A-2	92	78	0.425	4.0	2.91
	A-3	81	75	0.731	6.0	3.92
	A-4	79	78	0.760	1.0	2.22
	A-5	91	85	0.831	6.0	3.81
	A-6	78	72	0.774	6.0	3.82
2 (90% PB)	A-1	89	75	0.621	14.0	2.51
	A-2	78	97	0.852	19.0	2.45
	A-3	83	73	0.878	10.0	3.72
	A-4	88	80	0.890	8.0	2.52
	A-5	89	84	0.934	5.0	2.34
	A-6	81	72	0.871	6.0	3.27

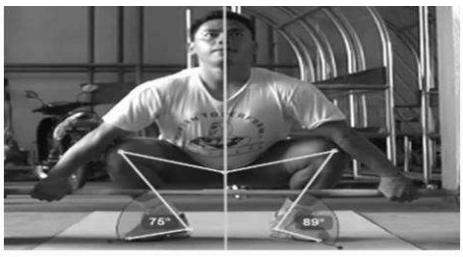

Fig. 3. *Initial position*

The lists of names of the athletes listed above are based on their best achievement. It clearly shows the average values of two attempts, maximal reached ankle angle of individual monitored persons and time of reaching this angle. Overall, it can be concluded that the average angle formed from the right and left ankle when performing forces with different loads is changed.

The average angle formed by the left ankle on the force 80% of the maximum load is equal to 5 degrees, while the right leg is 10 degrees. Practically all athletes have the right ankle angle larger than the left, when it will do the snatch with a load close to maximum. This is possible due to consider factors optimal balance of center of gravity between body weight with the weight of the load to be lifted. The most prominent right and left ankle angle difference occurs in the two athletes with the best achievement with the angle difference above 10 degrees.

This needs to be done further analysis by using electromyography to determine the maximum contraction between the right and left, so it can be known the cause of the difference. Profiles related to the speed and angular changes of the knee during a snatch are illustrated in the following table.

TABLE 2. THE GRIPS, KNEE, HIP AND TIME CHANGES DURING LOCOMOTION

Athletes	Attempts	Grips distance (cm)		SD (s)	Ankle distance (cm)		SD (s)	Knee Angle (°)	SD (s)	Hip Angle (°)	SD (s)	Time (s)	SD (s)
		left	right		left	right							
A-1	1 (80% PB)	33.7	34.3	0.02	63.4	66.5	0.03	46.3	0.02	112.7	3.33	0.47	2.32
A-2		**28.4**	**26.1**	0.03	**55.3**	**58.8**	0.02	**137.3**	0.03	**167.3**	3.32	0.60	2.21
A-3		29.1	29.6	0.04	61.7	60.4	0.02	85.7	0.04	127.2	3.34	0.78	3.12
A-4		27.7	27.1	0.03	57.1	56.3	0.04	63.2	0.03	85.7	4.24	0.85	4.42
A-5		24.3	24.7	0.04	60.6	61.1	0.02	71.3	0.04	65.9	4.13	1.05	4.51
A-6		26.8	27.4	0.05	58.9	60.4	0.03	55.2	0.05	113.5	3.12	1.63	3.29
A-1	2 (90% PB)	33.2	34.5	0.02	62.8	65.1	0.03	52.9	0.02	124.8	3.65	0.59	2.98
A-2		**27.4**	**26.2**	0.03	**54.7**	**57.4**	0.02	**169.5**	0.03	**184.5**	2.67	0.71	2.67
A-3		28.2	28.4	0.03	60.2	60.7	0.03	93.6	0.03	134.2	2.32	0.83	3.65
A-4		27.1	26.7	0.02	58.2	57.2	0.03	72.7	0.01	97.3	3.16	0.89	4.87
A-5		23.4	24.2	0.03	59.8	60.4	0.02	75.3	0.02	77.8	2.26	1.07	4.91
A-6		25.3	26.1	0.04	59.2	60.1	0.02	61.2	0.06	123.6	3.24	1.34	3.53

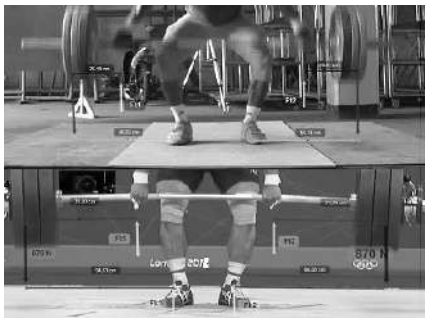

Fig. 4. *lift-off position*

Based on the individual profile, it can be concluded that there is a change of position of mechanical position of the body such as the position of hand grip on barbell, the distance between the positions of the ankle with barbell where it shows the width of the distance between the legs on standing, to do the lift-off position. In addition, the angular position on the joints and waist also changes along with increasing the load to be lifted.

Maximum values of hip angles, which mean maximum extension of knee angles and hip angle during the monitored locomotion were nearly the same in size (95.9° a 120.6°), for knee angle (61.1° a 93.6°), so were the time data (0.47 s a 0.73s). A2 has a profile that is different from most other athletes. It was close to the values with the degree of extension of knee angles value (137.3° a 169.5°). Extension of hip joints was distinctly greater (184.5°). The angular changes of knee and hips joint is shown in graph 1 (fig.6), meanwhile line in these graphs represent different phase of attempts, red line represent of knee joint and green line represent of hip joint.

To provide an explanation of the efficiency side of the barbell, it is evaluated both the barbell trajectory (fig.7) as well as barbell velocity (fig.8) features form the height of top dead centre (H1), bottom dead centre (H2) and the difference between these two positions during two attempts (tab. 3). Top dead centre comes up at the moment when the barbell loses contact with the platform – between phases 4 and 5 and bottom dead centre comes up at the catch phase (phase 6).

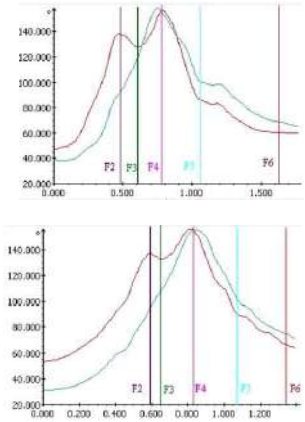

Fig. 6. *Angular changes of knee and hip joints.*

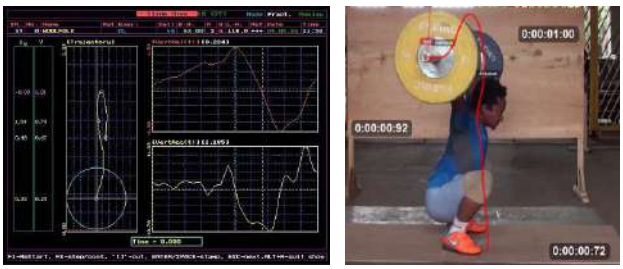

Fig. 5. *Bar Trajectory*

TABLE 3. THE HEIGHT OF TOP AND BOTTOM BARBELL AND BARBELL VELOCITY

Athletes	H1 (m)	SD (s)	H2 (m)	SD (2)	H1-H2 (m)	SD (s)
A-1	1.596	0.058	1.287	0.056	0.309	0.022
A-2	1.455	0.060	1.259	0.043	0.196	0.018
A-3	1.560	0.063	1.244	0.068	0.316	0.026
A-4	1.524	0.061	1.254	0.045	0.154	0.011
A-5	1.563	0.059	1.276	0.057	0.321	0.029
A-6	1.547	0.062	1.239	0.046	0.364	0.023

Athletes	Highest measured velocity in (abs_{max})	Standart deviation
A-1	2.66 m/s	0.36
A-2	2.39 m/s	0.22
A-3	3.42 m/s	0.32
A-4	3.13 m/s	0.33
A-5	3.01 m/s	0.28
A-6	3.14 m/s	0.27

The results of the tests showed that the highest speed of the barbell was reached in the snatch by A3 (3.42 m•s-1), then by A3 (2.66 m•s-1) and finally by A2 (2.39 m•s1). Graphs (fig. 6) show the progress of vertical velocity v(Z), horizontal velocity v(Y) and absolute velocity v(abs) of the barbell in time. With A1 and A2 can see that the velocity has one important peak, while A3 performs locomotion with nearly constant maximum velocity for the time of approximately 0.15 s. Pictures (fig. 7) show in which point the maximum velocity was reached.

The body posture of ankle, displacement of center gravity, center of body mass at the moment of maximum extension of A2 is shown in the pictures (fig. 9).

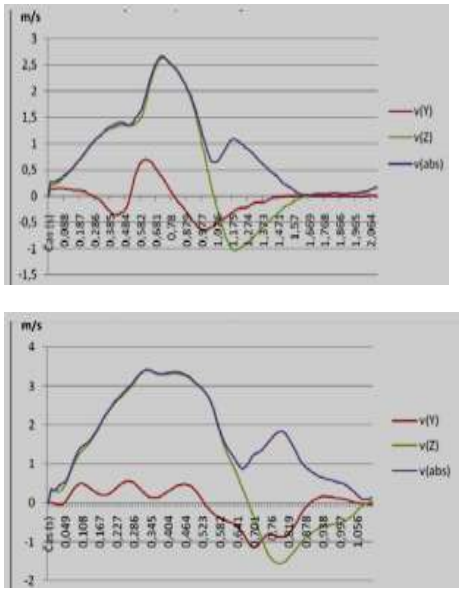

Fig. 6. *Graphs of the barbell velocity and maximum velocity*

Fig. 7. *Body posture and displacement.*

The significant difference between the ankle angle A2 compared with other athletes that impacts the body posture and the displacement of mechanical factors of the body in this case is the point of balance between weight and lifted weights are not in bodyline. This factor then causes the raised barbell to also be 1 degree angled towards the larger ankle angle. A difference of 1 degree of the barbell is lifted, would affect the weight of the barbell is lifted between the right to the left. With an un-mechanical position, the imbalance between the weight and the weight of the raised object becomes very inefficient. Therefore, angular changes in each body segment such as ankle, knee, waist need to be considered to get the most efficient body position based on the principle of biomechanics.

A. Discussion

The result of study shows that mostly athletes have already technical profile closed to the technical model which is lifted by literature. Generally it can be concluded that the quality of techniques owned is in accordance with the technique based on the principle of biomechanics.

A perfect body equilibrium position will be easily obtained when the angle at the ankle is widened, thus obtaining a larger cross sectional area, than ever before as the weight of the load to be lifted [7]. It shows also the same explanation of the kinematic principle that in the ankle angle during the first phase is approximately 70.45º, the second phase around 80.10º and the last phase around 90.71º [15].

The top lifters move the load from the lower extremities to the upper extremities efficiently, by straightening as well as enlarging the knee joint around 145.17º at the first extension, the transition phase about 128.0° and at the end of the second pull reaches around 162.5°[2]. It is proved by results of average value in the knee extension in the first phase of 137.45º, the average value of transition phase of 116.45º and average value of last phase of 169.5º. In addition, this study also shows the similar explanation with the currently research related to the bar velocity as well as bar trajectory changes as the weight of the load increases.

In addition to the similarity of techniques found between athletes with literature, in this study also found significant differences in techniques (fig.9), or commonly referred to individually malfunction, which is not discussed in other literature. This factor is believed to be the main cause difficult to achieve maximum performance.

As seen in Figure 9, the position of the foot between the right and left in this transition phase experienced the difference or in an asymmetrical position. The left leg looks floating and does not touch the floor, while the right foot still touches the floor to maintain a balance on the ground. This imbalance of body position causes a shift in weight (Cog), which should be a line with a body weight (cob). By having a position that is not a line between the weight points of the load with the point of weight, then the body will have difficulty in maintaining the balance while holding the load. As a result, the body will withstand an unbalanced load between the right and the left. The principle of equilibrium explains that if the body does not have a balanced bodyline position and separate around 10-20cm in holding the load, then the load to be lifted increases to 50% heavier than the actual load [16]. Figure 9 show that the distance between the weight of the object and the weighted load point separated 16cm apart. With the imbalance of the position, then affect the barbell position raised to be not in bodyline and become 1 degree angled. Based on the principle of equilibrium, it is possible that the athlete lifting weights 50% heavier.

The Unbalance the body position could be occurs due to a muscle imbalance of between the right and left. In addition, investigation related to the history of injury are also necessary to be able to determine the overall condition, especially in the lower extremities of the right which include the ankles, knees and hip that cause the movement of the body position to be not symmetrical. Further research related to kinematic analysis by adding electromyography is needed to be done, in additional can obtain further data related to the kinematic analysis as well as provide detail data regarding with potential muscle contraction or detect the muscle strength imbalance on the right and left.

The conclusion of this study is that the asymmetry position of joints leads to technical imperfections and will effect of the performance. Not only ankle joints but also knee and hip joints should reach the maximum extension

nearly at the same time, at the end of the fourth phase, when finishing the second pull [3]

Therefore, coaches should pay attention on individual technical malfunction not only based on technical model in literature and are recommended to provide a specific form of strength training to cover the muscle imbalance founded, thus helping athletes to get more effective and efficient techniques.

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Effect of Physically Programmed Examination to Value of Maximum Oxygen Volume (Vo2max) at Justice Cricket Junior Samarinda

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***Abstract*— VO2max is an important factor that contributes to the endurance of aerobic athletes. It reflects the cardiorespiratory capacity of a person, so the more oxygen that can be transported and consumed by the muscles that are on the move, the better the endurance of the athlete. The purpose of this study was to prove the usefulness of physical exercise programmed against the VO2max value of female athletes age 10-12 years. The study sample consisted of 40 female athletes age 10-12 years who were divided into 2 groups, namely control and treatment group. VO2max values were measured before and after the subjects performed a 12-week programmed physical exercise, using the modified Queen's College Step test method. The unpaired t-test is used to compare changes in VO2max values between groups. There is an increase in VO2max value in female athletes age 10-12 years who received a programmed physical exercise.**

Keywords—vo2max, programmed physical exercise, female cricket athlete

I. INTRODUCTION

In the development of medical science, sport has got a place in the world of health as one important factor in the prevention of disease. Someone who has a prime physical fitness can perform daily activities optimally and do not tire quickly, and still have energy reserves to perform other activities [1]

One of the new sports and started a lot of popular community is a sport cricket, this sport can not be separated from the need for good physical fitness. One element of physical fitness is cardiorespiratory endurance. Basically, there are two kinds of cardiorespiratory endurance, namely aerobic and anaerobic. During cricket play, it takes anaerobic endurance to perform explosive movements that require an explosion of energy. But for the game in general, movement patterns, as well as recovery time, aerobic endurance is needed. Measurement of cardiorespiratory endurance for aerobic capacity can be performed by measuring maximal oxygen consumption (VO2max).

VO2max is the maximum amount of oxygen that can be consumed during intense physical activity until eventually fatigue occurs [3]. VO2max values depend on cardiovascular, respiratory, hematologic, and muscle oxidative abilities [4]. Physical fitness is the dynamic degree of a person who is the basis for the successful execution of the task to be performed. Therefore, absolutely necessary coaching and maintenance of one's physical fitness. For the successful implementation of this task needs to be a match between the requirements that must be met that is anatomical and physiological to the kind and intensity of physical tasks performed. Skill related fitness is defined as skills that support one's performance in sports and other physical activities. Included in related fitness skills are agility, balance, coordination, reaction time, speed, and power [7].

A. Cardiorespiratory Endurance

Cardiorespiratory endurance is the body's ability to perform intense and sustained physical activity by involving a large group of muscles. This cardiorespiratory endurance includes the most important element of physical fitness. Exercise to improve cardiorespiratory endurance can lead to increased aerobic capacity of a person [8].

B. Factors Affecting VO2max Value

Some factors that may affect the VO2max value are as follows:

1. Age

Cross-sectional and longitudinal studies of VO2max values in untreated 8-16 year-olds show progressive and linear increases from the peak of aerobic ability, with respect to chronological age in girls and boys. VO2max boys become taller by the age of 10, although some believe exercise resistance is not affected by aerobic ability before age 11. The peak VO2max score was achieved approximately at age 18-20 years in both sexes.

In general, aerobic ability drops slowly after the age of 25 years. Research from Jackson AS et al. found that the mean reduction in VO2max per year was 0.46 ml / kg / min for men (1.2%) and 0.54 ml / kg / min for women (1.7%). This decrease occurs due to several things, including maximum heart rate reduction and maximum stroke heart rate.

2. Gender

Women's aerobic ability is about 20% lower than men of the same age. This is due to hormonal differences that cause women to have lower hemoglobin concentrations and greater body fat. Women also have less muscle mass than men. From the age of 10 years, VO2max boys become 12% higher than girls. At age 12, the difference is 20%, and at 16 years of age VO2max boys are 37% higher than girls.

3. Temperature

In the luteal phase of menstruation, progesterone levels increase. Though progesterone has a thermogenic effect, which can increase the body's basal temperature. The thermogenic effect of this progesterone seems to increase BMR, so it will affect the cardiovascular work and ultimately also affect the value of VO2max. Thus, indirectly, the temperature change will affect the value of VO2max.

4. State of the exercise

Physical exercise can increase the VO2max value. However, VO2max is not fixed to a certain value, but can change according to the level and intensity of physical activity. For example, the old bed-rest can lower VO2max between 15% -25%, while regular intense regular exercise can raise VO2max with almost similar values.

Effective physical exercise is endurance and includes a certain duration, frequency, and intensity. So that can be said that the activity and background of an athlete's exercise can affect its VO2max value.

C. Factors Determining the VO2max Value

1. Pulmonary function

During intense physical activity, there is an increased need for oxygen by the muscles at work. This oxygen requirement is obtained from ventilation and oxygen exchange in the lungs. Ventilation is a mechanical process for inserting or removing air from the lungs.

2. Cardiovascular function

The most important cardiovascular response to physical activity is an increase in cardiac output. This increase is due to an increase in the stroke volume of heart and heart rate which can reach about 95% of its maximum level. Because oxygen consumption by the body can not exceed the speed of the cardiovascular system by delivering oxygen to the tissues, it can be said that the cardiovascular system may limit the VO2max.

3. Red blood cells (Hemoglobin)

4. Body composition

Fatty tissue gains weight, but does not support the ability to directly use oxygen during heavy exercise. Thus, if VO2max is expressed relative to body weight, the weight of the fat tends to increase the denominator without causing any effect on the VO2 numerator; VO2 (mk / kg / min) = VO2 (LO2) x 1000 Weight (kg)

Thus, obesity tends to reduce VO2max.

D. VO2max measurements

To measure VO2max, there are several tests that are commonly used. These tests should be measurable and easy to implement, and require no special skills to do so. Bicycle and treadmill ergometer tests are the two most commonly used ways of generating workloads. Even so, step test or field test can also be done for the same benefit.

1. Bicycle Ergometer

Performed by using a static bicycle pedaled to get the workload. Workload can be provided continuously or intermittently. This bicycle ergometer can be mechanical or electrical, and can be used in both perpendicular and supine positions.

2. Treadmill

Some of the protocols that can be used in inspection with treadmills are: (1) Mitchell Method, Sproule, and Chapman, (2) Saltin-Astrand Method, and (3) OSU Method. 3. Field Test

This test is very easy to do, because it does not require special tools. Testee is only required to run by a certain distance or time. Some variations of this test are: (1) 12 minute run, (2) 1.5 mile run, and (3) 2.4 km run test.

4. Step Test

Many variations of this test with respect to the number of steps per minute and the height of the bench used to generate the workload. Testee moves up and down the bench alternating legs with a rhythm that is set with a metronome. Although it is easy to do and does not cost much, the exact workload is hard to come by with this test because fatigue that may arise during a test can affect the accuracy of the workload and the point of gravity. VO2max values can be obtained with the Astrand normogram based on pulse and weight or using formula calculations. The available formulas also vary, with the standard VO2max values vary as well. The data needed to calculate VO2max is a recovery heart rate. Some variations include: (1) Harvard Step Test, (2) Queen's College Step Test, (3) Tuttle Step Test, (4) Ohio Step Test, (5) YMCA Step test, and (6) Tecumseh Step Test.

E. Physical Exercise Physically

What is meant by physical exercise is programmed physical exercise that is done regularly with the intensity, frequency, and duration of a certain, and have a specific purpose as well.

1. Exercise intensity

Athletes should be given training until their heart rate reaches 80-95% of the maximum heart rate. While the maximum heart rate that can be achieved during the exercise is 220 - age (in years). An 80-95% heart rate of the maximal heart rate is called the target zone. If the intensity of the exercise given is less than the target zone, then the results do not improve much endurance.

2. Duration of Exercise

Duration of exercise should range between 40-45 minutes within the target zone if it is to achieve endurance improvement. This does not include warm-up and cooling times.

3. Frequency of Exercise

We recommend that you practice at least 3 times a week to get good results because endurance someone will start to fall after 48 hours if not undergoing exercise. For an athlete, the higher the required endurance factor in the branch, the higher the VO2max number it should have. In this study to be used is a method of Queen's College Test with a modified bench made as high as 28 cm.

II. MATERIALS AND METHOD

This research is a quasi experimental research with the design of Two Group Pre and Post Test Control Group Design;

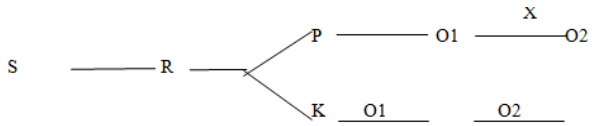

Fig 1. Design of quasi experimental method

Information :
S: Subject R: Random P: Treatment group K: Control group, O1: Measurement of endurance before treatment. O2: Measurement of endurance after treatment for 12 weeks
X: Programmed physical training

The target population in this study were girls who are athletes cricket junior daughter Samarinda age group 10-12 years and follow the physical exercise programmed during the month of January-March 2017 as treatment group, as well as elementary school students 031 Samarinda which has been selected through inclusion and exclusion criteria.

The sample selection was done by simple random sampling. The sample size is 20 people per group. The independent variables in this study are physical exercise programmed athletes cricket junior daughter of Samarinda. Physical exercise is an exercise that is done regularly with the intensity, frequency, and duration particular, according to the program that has been set. Using a nominal scale. Variable depending on this research is VO2max value. Measured using the Queen's College Step Test. Using continuous scale.

The result data is VO2max edited, coded, and dientry in computer file using SPSS 15.0 for Windows program. After cleaning, statistical analysis is tested using descriptive analysis test and inferential test analysis. All data distributions were tested for normality using the Saphiro-Wilk test. In characteristic data, it was found that age data and BMI had normal distribution, so continued with t-test was not paired and the result was that the two groups were not significantly different.

The difference in initial and final VO2max values in both groups was tested using the Wilcoxon test because the VO2max value had abnormal data distribution. It was found that the difference between initial and final VO2max values in each group had a significant difference. The p value is considered significant when $p < 0.05$.

III. RESULTS AND DISCUSSION

There were 40 subjects who met the inclusion criteria. The subjects were divided into two groups, namely the treatment group and the control group, using simple random sampling. Initially, data collection of research subject characteristics was done. The data was collected on the initial VO2max value. The treatment group performed a programmed physical exercise for 12 weeks, while the control group did not perform the programmed physical exercise. After 12 weeks, the final VO2max data is taken. The number of study subjects did not change until the end of the study.

The results showed that the study subjects had almost the same age, in which the treatment group had a slightly older age than the control group. In the results of weight and height measurements there was a significant difference between the two groups, ie the treatment group had body weight and height greater than the control group. But the difference in body weight and height is not too affect the overall research results because in the end BMI both groups are not significantly different.

VO2max measurements were performed using the Queen's College Step Test method with modified bench height, performed 2 times over an interval of 12 weeks.

It can be seen that the mean initial VO2max values in the treatment group were lower than the control group. In contrast, the final VO2max value in the treatment group was higher than the control group. From the results can be seen also that there is a change in VO2max value in both groups. The control group experienced a significant decrease in VO2max value, while the treatment group experienced a significant increase in VO2max value.

TABLE I. CHARACTERISTICS OF RESEARCH SUBJECT

Measurement	Control Group (Average)	Standard Deviation	Treatment Group (Average)	Standard Deviation	p
Age (years)	11,65	0,81	11,70	0,92	0,976§
Weight (kg)	36,85	10,54	42,75	7,47	0,048*
Height (cm)	142,16	9,19	151,21	8,49	0,003*
BMI (kg/m2)	17,94	3,51	18,58	2,18	0,493*

TABLE II. VO2MAX VALUE BEGINNING AND END

VO2max (ml / kg / min)	Control Group (Average)	Standard Deviation	Control Group (Average	Standard Deviation	p
VO2max start	44,38	3,85	39,91	4,50	0,002*
VO2max end	36,96	5,63	42,53	4,68	0,003§
P	0,001£	-	0,045≈	-	-
Delta VO2max (ml / kg / min)	-7,42	6,46	2,62	5,03	<0,001*

From the research data obtained that there is an increase in VO2max value in the treatment group, the junior sickle cricket athletes Samarinda age group 10-12 years after doing the physical exercise programmed. While in the control group, namely elementary school students 031 Samarinda actually decreased VO2max value. Increased VO2max values in the treatment group who performed the programmed physical exercise in accordance with some similar studies that have been done previously. This increase is influenced by several things: physical exercise, cardiovascular function, and body composition.

Theoretically, the control group should have an increased VO2max value because VO2max values will increase with age (35). However, this can not be used as a base when the study time is only 12 weeks In addition, it should be considered also non-physical factors, namely the psychological condition of research subjects. One of the main problems in sub maximal exercise tests such as this step test is the lack of motivation of research subjects to perform the test. The differences in physical endurance among individuals are not only related to physical capacity alone, but also relate to the psychic capacity to suppress the symptoms and manifestations of fatigue that arise, where psychological endurance is lower in those with less physical endurance.

The subjects for the control group were elementary school students whose physical activities were limited to daily living activities, while the subjects for the treatment group were junior cricket athletes who had grown accustomed to regular physical practice. Thus, the motivation for performing this test in the control group was more unstable than the treatment group, so the control group's VO2max value decreased.

IV. CONCLUSION

The programmed physical exercise for 12 weeks can significantly increase VO2max value. Beside that, there was a significant difference in VO2max value changes between groups who received a 12-week programmed physical exercise with a group that did not get a programmed physical workout. The group that did not get the programmed fiscal exercise decreased significant VO2max value.

It is needed to do more research with the characteristics of subjects more controlled and doing research on VO2max by taking into account puberty factor to get more accurate results.

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The Throwing Techniques in Martial Arts for Beginner on Match Category

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***Abstract*— The purpose of this paper is to illustrate the composition of motion throwing techniques in martial arts in accordance with qualitative biomechanical analysis for beginners. The throwing techniques are done with series of complex motion, so the fighter needs a model of exercise that can facilitate in studying such technique, especially for beginners on match category. The fighter will more easily master the techniques and assist the trainer in the training process. The design of the study is qualitative. The researcher collected the data through observation. The findings are presented into some motions: the initial attitude (ready position), the catch process, the process of eliminating the opponent's balance, and the follow-trough phase.**

Keywords— throwing techniques, match category, beginner.

I. INTRODUCTION

The martial arts sport has a variety of techniques that must be mastered by the fighter, especially the fighter who will compete in the match category. The technique consists of three basic techniques, namely attack techniques (kicks, punches, and strokes), defense and throwing technique (Widiyanto and A. Hariono, 2015). The techniques used in the game of martial arts have different values, among which is the throwing technique that has the greatest value aiming to drop the opponent by preceding the catch. The throwing technique is a technique used by the fighter in the comparative category to drop opponents beginning with the catch process. According to the research conducted by Nugroho (2005), the dominant techniques used in the game of martial arts were: (a) 44% kick techniques, (b) 33% stroke technique, (c) 14% throwing technique with a catch, (d) 5% dropping technique, (e) 3% defensive technique with kicking, and (f) 1% cutting technique with punch.

According to Bompa and Carerra (2015) at the age of post-puberty or adolescence age, someone who engages in sports activities will enter the stage of specialization skills, meaning that teenage athletes have practiced the skill of a sport. Bompa further states that "in specialization stage, athlete may improve and perfect the technique of the sport. It is biomechanically correct and physiologically efficient. Athletes should perform difficult technical skills frequently during training sessions, incorporate them into specific tactical drills, and apply them in competitions". Similarly, according to Hariono (2004), the technique of slamming is one of the techniques in martial arts which has relatively high difficulty, therefore the technique of throwing is given after the fighter master some techniques such as punch and kick techniques, while in the process of tracing a technique that has high difficulty requires a clear picture when going to do the technique for athletes to better understand the stages of movement to do. To achieve this, a motion analysis technique required drop so that the movement will be done effective and efficient. Furthermore, Good mastery of the technique will affecting on the level of energy efficiency for the fighters, so as to perform the activity repeated in quite a long time without experiencing physical exhaustion and psychological (A. Hariono, 2015).

The throwing technique has a series of variation in which the catch is very diverse in a martial arts match. According to Hariono (2004) there are approximately seven kinds of falling techniques that are dominantly used during the game. Because the technique of throwing is a relatively difficult technique, then when the throwing technique given to the fighter must go through the correct stages, it means that the trained technique movements should start from the initial stage, the stage of implementation, the final stage which certainly does not harm the fighter. On the basis of these assumptions, this paper will take several types of techniques that are safe and can be done by teenage fighter using sports biomechanics analysis. Sports biomechanics is a science that elaborates the forces and effects of the forces that occur in the human body during exercise. Through the application of sports biomechanics to technical exercises, it will be very useful to form the correct movement of techniques. In addition, someone who is directly involved in sports exercises such as trainers will be very helpful to carry out the exercise, for example they can precisely analyze the techniques performed by athletes, determine the movements which will improve athlete performance, determine the tools to be used in training appropriately, be able to identify movements that might lead to injury, and identify the type of exercise to be performed to improve athlete quality (P. McGinnis, 2013).

The technique of throwing is still dominantly used as a technique that will produce the greatest value. Based on observations in some practice sites, the current model of throwing techniques is still seen from previous experiences of a senior athlete and tends to athletes focus more on the final result regardless of the correctness of the motion techniques performed. The researchers found that in a 28 games of youth

martial arts match, the throwing technique happened 171, 122 unsuccessful techniques failed to score and 49 throwing techniques produced value, resulting from the observation of 71% athletes experience failure and 29% throwing techniques successfully produce value. However, this is only seen from the success of the athlete dropped the opponent, while in terms of the truth of throwing technique is not clear. The technique of throwing is more advantageous because the fighter can stop the opponent's attack so that the opponent does not get a chance to do a counterattack. Furthermore, the fighter who does the throwing technique appropriately and correctly will be able to drop the opponent and get the greatest score.

II. MATERIALS AND METHOD

The method used in this paper is direct observation by recording throwing techniques with handycam and analyzed through kinovea software. Then the researcher analyses the movement and gives an indicator in the motion of the technique of throwing, which will support the successful implementation of the technique.

III. RESULT AND DISCUSSION

Based on the analysis that has been done with kinovea software tool, it is found that the stages of motion of throwing technique are: (1) ready position, (2) Implementation process: (a) catch process; (b) the process of eliminating the opponent's balance, (3) follow-trough phase.

Throwing technique is one of the techniques used in a martial arts match to knock an opponent that begins with the process of capturing a foot or kicking attack.

Throwing techniques are including in defensive technique. Defensive methods in most martial arts have been classified into five types of movements; throw, evade, block, fend off and *makan gerak*. These classifications were made based on personal observations and experiences in martial arts.

The defensive moves in this paper refer to the preliminary move taken as a response towards the striking force and all these techniques are widely used and are considered as the initial steps which are included in the whole technique. Throw is a technique with which the defender catches the attacker’s limb that is being used to apply the force. The defender would normally utilize the momentum of the attacker to complete the defensive formation. Even though more than one style of martial art uses the grab technique, it is more commonly observed among Judo practitioners when they apply the throw technique (Mustapha, G., Mahmud, J., Zakaria, M., Sulaiman, W, 2015).

a. Biomechanics Principles of Throwing Techniques

Biomechanics according to Hay (1982) is the study of the internal and external forces that work on the human body with the consequences of the forces generated. The definition is in line with the opinion of Hamill et al (2015) namely, "biomechanics is the study of the structure and function of biological systems by means of the methods of mechanics". Meanwhile, according to Hall (2012) "biomechanics is the application of mechanical principles in the study of living organism". From some of these definitions, biomechanics is a field of science that studies the internal and external forces with the principles of mechanics. If biomechanics is applied in the field of sports and sports exercise it can be said that sports biomechanics is a science that studies the internal and external forces and their effects on the human body when doing exercises and sports.

The biomechanics applied in sports certainly has specific sports-related benefits that are aimed at achieving the best performance, while according to McGinnis (2013) the primary objective of sports biomechanics is the improvement of sports or exercise performance, while the secondary goal is injury prevention and rehabilitation. This secondary objective is closely related to the former and is almost regarded as part of the main goal, because an unscathed athlete will perform better than the injured athlete.

McGinnis further makes the items that are the primary goal for (a) technique improvement; the most common method for improving performance in many sports is to improve an athlete's technique. The application of biomechanical analysis to improve techniques can occur in two ways namely qualitative biomechanical analysis methods and quantitative biomechanical analysis methods. In the first method, the trainer observed the motion practiced by the athlete. Then the trainer directly gave feedback about the motion. In the second method, the trainer videoed the motion of the athlete and it will be analyses using certain software. The software will give the result in the form of graphic and number accurately. Based on this result it will be seen which motion that should be corrected. In other words, a trainer or teacher uses biomechanics to determine what actions can improve the performance of his athletes, (b) the improvement of the equipment, the equipment used will obviously affect the performance of the sport, either directly or through injury prevention, (c) quality training, biomechanics have the potential to produce modifications in training and thus improve athlete performance. This biomechanical application can occur in several ways, the analysis of the athlete's technical deficiencies can help the trainer or teacher in identifying the type of training the athlete needs to improve. Secondary objective of biomechanics application in sport is to prevent injury and rehabilitation.

Biomechanics can be used to provide a technological change base for more efficient, equipment changes, or training to prevent or rehabilitate injuries. Movement techniques performed by an athlete should be done efficiently, if the movement is efficient then the athlete can control the movement and master a game in the field. According to Hidayat (1999) the motion is said to be efficient when: (a) large muscle groups work first, (b) intelligent exertion, meaning good coordination when appropriate timing, (c) moves proportionally, meaning that it is economically viable and automated. Conversely, inefficient movements will cause: (a) excessive labor and tension, (b) excessive physical fatigue, (c) lethargy, (d) pain, (e) frustration.

In the sport of martial arts, a throwing technique that successfully knocks the opponent will produce the highest score. The technique of throw is a technique preceded by a catchment process and then followed by means of dropping the opponent with simultaneous movement simultaneously. To form the technique of kickback for martial arts athletes, it is important to have an exercise model that can be done in stages in accordance with the sequence of techniques that will be done. The stages for performing throw techniques are: (a) initial attitude stages, (b) catch stage, (c) implementation stage or process of eliminating opponent's balance, (d) follow-trough phase. Based on the sequence of stages, the athlete's technique moves involves forces that will cause the movement to occur.

The athlete's body movements are influenced by the principles of mechanics in performing the motion of the technique, following the mechanical principles affecting the throwing technique:

1) Acceleration

Acceleration is a change of pace (P. McGinnis, 2013). McGinnis further states that "when an object speeds up, slows down, starts, stops, or changes direction, it is accelerating". Acceleration that occurs at the time of doing the throwing technique is on the whole series of motion. One of them is when the fighter catches the kick from the opponent and their hands were motionless. Then the fighter catches the kick quickly.

2) Force

The force according to Hall (2012) is the product of mass and acceleration, where the formula for finding a force is F = ma (F: force, m: mass, and a: acceleration), either by push or pull. A force in moving something has a direction therefore a force is a vector quantity. In the implementation of the technique of throw, if the fighter has a large body mass then at the time of moving will produce a great style as well. In addition, if the fighter has a high speed at the time of doing the throwing technique will affect the force needed. In throwing techniques, the application of greater force is generated at the stage of execution and the advanced stage, because the fighter will try to knock the opponent, while in teenagers martial arts is arranged with classes based on weight by the difference of 5 (five) kilograms. Therefore, fighters who have weight on the lower averages will require a greater force that is by adding speed during the process of throwing to drop the opponent with the weight that is in the upper average.

3) Angular Motion

Angular motion is based on McGinnis' idea (2013) with regard to rotation. This happens when a body or object moves around or part of a spin on an axis. Angular motion can occur in the axis that is outside the body or in the body. In motion angular motion techniques always occur both on the joints of the body and the wheelbase on the opponent's foot. In this research will take some form of throwing technique with the assumption that the technique is a simple throwing technique and not dangerous to be done by adolescent fighter. Examples of angular motion that occurs in the shape of a dribble as in the movement of the catch, the arm will move in a circle to catch the kick, then after being caught then the position of the foot that is in front of the parallel with the right foot and then throw the foot caught with the rotation of the fighter's body so that the opponent's body will lose balance and eventually fall.

4) Centre of gravity and balance

According to Blazevich (2007) "the point at which the mass of the body is evenly distributed in all directions is the center of mass". So according to Balzevich the center of gravity and center of gravity have almost the same terms, except that the center of gravity is only used to show when the body is in a vertical direction, thus the lower the center of gravity the body gets more balanced. In addition, the balance according to Hall (2012) is a person's ability to control equilibrium.

In the execution of the technique the center of gravity of the body weight will vary according to body movement and body position. The success of the kickback technique is that when the fighter managed to drop the opponent without falling together or fallen after doing business to slam. This means that the fighter has to perform a series of fast and simultaneous technique movements so that the opponent does not have time to anticipate during the kickback process. The rapid and simultaneous movement starts from the catch process, the process to eliminate the balance of the opponent, until the final process is to keep the body from falling along with the opponent.

The movement response when capturing the opponent's kick is very influential to the implementation of the throwing technique, the more timely the reaction and the target will facilitate the fighter to perform the technique of throwing. For that attitude the pairs of arms or palms determine the speed to capture the kick.

5) Momentum

Momentum is the magnitude of the thrust force of an object. In other words, it is the momentum as a force of motion (Sudarmada and Wijaya, 2015). In the technique of throwing momentum can occur when the two fighter make the movement of catch, when the two fighter have the same weight of the type of catch can be done in unison with the kick process, but when the fighter will slam with a catch that tends to wait for the opponent's kick then the fighter must pay attention to the proximity of the amount of weight with the opponent.

b. Analysis of Throwing Technique in Martial Arts

The motion of throwing technique in martial art occurs very fast. Therefore, the author will focus on the dynamics of movement from stage to stage. According to Arus (2012) the movement of techniques in sports martial arts very quickly different from sports related with distance and speed, therefore in the martial arts a little difficult to determine in detail related to speed, acceleration, momentum, work, energy, power, angle movement. The extremities of the body involved in throwing techniques are the upper and lower extremity, on the upper part of the body especially the arms (biceps, palms, arms, and hands), brachioradialis, palmaris longus, the majority of the flexors, abductor pollicis, pectoralis minor and major, deltoid (all three parts), trapezius and latissimus dorsi (E. Arus, 2012).

The following is a descriptive analysis of the stages of motion in performing the throwing technique:

1) Ready position, namely the attitude of right foot pairs in front (front and rear legs are not on a straight line). The position of the hand is in front of the chest and ready to catch the kick, but still relax. A straight forward view (Fig. 1).

Fig.1. Ready position (private doc, 2018)

Attitude pairs (ready position) to do the throwing technique at athletes who are not left-handed the head position following the eye view of the opponent's shoulder position, it is very influential for the reaction process at the catch kicks because if a fighter will kick the other limbs that will following the movement is a shoulder movement. The position of the right arm and left is in front of the chest. The magnitude of the knee flexion angle that is in front is smaller than the angle of the back foot flexion, the right arm flexion angle is greater than the flexion angle of the left arm. The position of the foot is not aligned and the distance adjusts to the shoulder width of the athlete.

Based on the figure it can be seen that the attitude of pairs (ready position) can be explained as follows: (1) the view leads to the opponent; (2) the right arm is in front of the chest, palms are waist-deep, and the elbows are slightly bent and the position of the hand is parallel to the legs that are in front; (3) the left hand is in front of the chest with the position of the arm bent; (4) center of gravity tend to be perpendicular to both feet. Attitude of pairs on every technique that will be done athletes is very influential on the results of engineering movements that will be done, because the attitude of the tide is the initial attitude of the body to perform techniques that are continuous movement.

Attitude that is done with both legs is not parallel between the front and rear legs, because the motion of the technique is a technique to kick the elimination of the opponent's balance then the attitude of the tide is done tide attitude that gives base of support (BOS) is wider, with the better balance gets. The attitudes tend to place the weight on both legs, so that the front leg knees are not bent too much and not too low because it will inhibit the movement or process to eliminate the opponent's equilibrium, because the athlete will require a greater force to eliminate the opponent's equilibrium. In addition, with the weight in the middle will speed up the catch because the distance between the palms of the hands with the feet to be caught closer.

2) The implementation process, which is an effort where the athlete moves to eliminate the opponent's equilibrium with a series of planned slings. The explanation of the stage of execution of the first type of throw: (a) the position of both hands to catch the kick with the position of the right hand is under the opponent ankle, and left hand holding the opponent's limb in the top position; (b) The position of both legs is fixed, then the held leg is pulled forward from the opposite position and positioned the foot downward along with the pulling of the right foot pedestal so that the right foot parallel to the left foot. The next movement, if the foot is on the mattress about 30 cm then the foot that has been captured rotated towards the right quickly coincided with stepping right foot to the right and followed with the left foot forward.

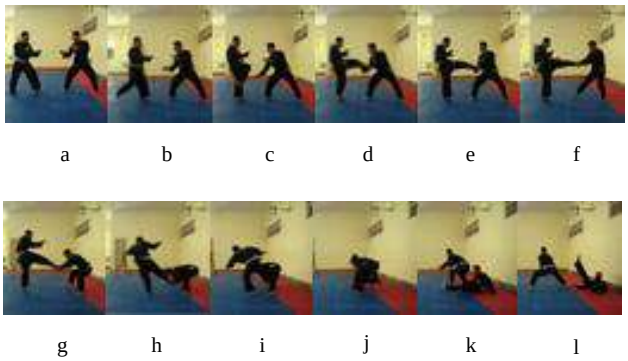

Fig. 2. (a, b, c): ready position, (d, e): the catch process, (f, g, h and i); the process of eliminating the opponent's balance, (j, k, l): follow-trough phase.

Based on the picture above (Fig. 2), the movement analysis on the implementation process is done by the steps as follows: (1) athletes do catch with the right hand palm, while the palm of the left hand holding the top of the opponent's foot so that the catch will be stronger. The position of the horses is still maintained to maintain balance when accepting style (kicks); (2) the athlete pulls his body backward so that the center of gravity shifts and the foot pedestal moves on the left leg, while the opponent's position becomes unstable because with the effort to pull the opponent's foot quickly will cause the balance of his body disturbed, the speed of the pull can be seen from the foot the lifted athlete to obtain the mechanical advantage of increasing pressure on the mat; (3) the athlete pulls the opponent's leg downwards using the direction of the force, thus affecting the acceleration; (4) accelerated acceleration is used to change the direction of force (towards the left side of the opponent) so that the centripetal force experienced by the opponent, with the application of the centripetal force, the opponent's body will instantaneously change direction quickly (cannot control the force that occurs on his body) and in the end it will be easy to drop.

3) Follow-trough phase, the body rotates to the right after both hands turn the foot to the right, performed simultaneously. A follow-up movement by turning the body to the right will end with the final attitude as an attitude that supports the athlete not to fall over with the opponent being thrown.

Therefore the final attitude of this throwing technique is to do the horses.

IV. CONCLUSION

The forms of throwing technique are very diverse. It is determined by the type of kick that will be caught and dropped. In the implementation of throwing techniques, there are several stages to be done so that the technique of throwing can be done effectively, efficiently, and will not be dangerous for beginner fighters. The stages are (1) ready position, (2) the catch process, (3) the process of eliminating the opponent's balance, and (4) follow-trough phase. The four stages are the process of learning the motion of the throwing technique that became the core of every motion. In addition, these stages will be useful for trainers to provide technical training more easily and efficiently.

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Exercise Method of Hockey Basic Technique Skills

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***Abstract*— In this research, 20 from 54 the cluster of the student is random sampling. The research was focused on three aspect; training method and motivation achievement to the ability of the basic techniques of hockey students. The data were collected with questionnaire and analyzed with tuckey analysis. Result on the analysis it is concluded that (1) the ability of the basic techniques of hockey students who are given the tactical training method is higher than students who were given drill training method.**

Keywords— ability of the basic techniques of hockey, training method

I. INTRODUCTION

Game hockey is one of the sports that was built in SMAN 3 Samarinda incorporated in extracurricular. The hockey team that fostered it has a poor performance in every competition that followed. Though in the coaching is trained by a tactical trainer brought from Mulawarman University which is credibility in hockey sports is no doubt with the intensity of exercise three times a week. To get a good and reliable player requires a player who has a good level of basic engineering skills and good physical condition as well, because the mastery of good basic techniques will greatly influence in a game.

Basic techniques that need to be mastered by a hockey player include passing, stoping, dribling, and shooting. From the field writer's observation of hockey team SMAN 3 samarinda it is found that, in a team match is often experienced failure in the attack, it is caused less accurate mastery the ball caused by dribblling techniques that are controlled less, whereas dribblllig is one of the success of someone support hockey player in game proofing. When biomechanically analyzed errors in dribbling may be too stiff hand holding a stick so that the wrist round is less relaxed or the ball position with the stick too far so the ball becomes wild and hard to control, or maybe errors in other body positions. To be able to correct the errors that occur it needs to be fixed basic techniques than the dribbling itself, and it can not be separated also the role of trainers in using the technique training methods in the exercise.

A. Skill of Hockey Technique

Dribbling is a skill in the motor domain and is often referred to as motor skills. Such motor skills can be distinguished by fine motor skills and gross motor skills. Magill says that "motor skills can be categorized with rough skills and refined skills. It further states that: sport skills almost entirely use rough skill" [10]. Skills can be classified with open skills and closed skills. Furthermore it is said that closed skill is a skill that is not influenced by the surrounding environment, whereas open skill is skill which is enjoined by the surrounding environment [9]. To be able to master the basic technical skills of hockey skills is not independent of the role of motor learning ever done before. Motor learning itself is "aset of processes related to practice or experience that lead to permanent change in skilled behavior. There are three stages in motor learning that are: 1) cognitive stages, 2) association stage, 3) automation "[9]. This is similar to that proposed by Magill that; Stages of motor learning: 1) cognitive stage, 2) associative stage, 3) automatic stage [10].

From the opinions above can be described that to get a skill that can last long required once the process of motor learning. The motor learning process itself must go through the first stages is the cognitive stage, and at this stage the athlete is given information about the movement to be performed, so that the implementation of the motion task begins the acceptance of information and the formation of motor programs. The second stage is the associative stage, ie at this stage the athlete begins to implement what has been reflected in his memory, which is characterized by the more effective ways of performing the task of motion, and he begins to adjust to the skills he performs. here will be seen a coordinated appearance with the progress that occurs gradually, and slow other movements become more consistent. The third stage is the stage of Automation, after the athletes train for some time, it will enter the automatic stage, marked by motor skills that do happen automatically.

B. Dribble Hocking (Dribble)

In general, dribble is defined as a movement to control the ball that moves with maximum speed along the field with the stick. According to Anders and Myers that dribble is the act of running with the ball while keeping the stick close to the ball [1]. Ten and Haridas say that dribble is a way of escorting a moving ball [12]. It is the skill used to break away. So to get a hockey player who has good basic engineering skills, in the execution of the exercise is very necessary to use the stage of exercise in accordance with the stages of motor learning, which begins with cognitive, associative and automation. By going through the stages is expected to master the basic techniques of hockey game can run well with the ball when escorted by the opponent. Dribble the movement of a player while controlling the ball with stick [7].

The ruler of indor hockey make it almost imposibble to dribble through a skilled defender. To beat a skilled defender a player must either pass the ball or create space to dribble by misleading the defender [6]. The hockey sports branch is generally known to have three dribbles namely (1) dribbled (Close Dribble), (2) dribbling off (Losse Dribble), and (3)

Indian dribble dribbling [6]. Thus to be able to carry out the dribbling skills of the Indian way in accordance with the demands of modern hockey games today, each player needs the support of adequate physical abilities such as speed playing the ball to the right and left, endurance, hand strength, stamina , and agility move. Because it suits the purpose of dribbling which, among other things, is to attack the opponent's defense area, to be able to control the ball as long as possible in his team, and to keep the ball and the opponent away, the player must be able to move swiftly to play the ball to dodge and deceive the opponent in order to attack to the opposing game area or to survive.

C. Technical Exercise Method

The training method is a lesson for developing practice, where the word method is used for the material conditions of activity "[6]. Bompa states that exercise is a way to achieve the goal of improving the organism's system and its function to optimize the performance or appearance of the sport [3]. The MoNE further states that good and successful practice is done regularly, thoroughly, systematically, and continuously / continuously; throughout the year, with an ever-increasing and gradual training load every year [2]. "Technique training is aimed to be able to (learn hard) movement techniques, such as: kick ball technique, servise, fast track, long jump, etc" [8]. In words we can make it clear that regular and sustained exercise will make a movement technique trained to be an automatic movement. In learning motor / learning / exercises didefinisika is to perform skills. And the exercise should be more than ever and consistent. The skills of motion controlled must be permanent anyway, so that whenever such skills are required automatically will occur. So the motion skills performed do not require a hard effort to do so.

From some of the above definitions of methods and exercises we can conclude that the exercise method is a systematic and planned way that serves as atat to present sports activities aimed at the skills of motion or exercise. Various efforts are being made to improve sports skills and maintaining physical fitness. In this regard various approaches taken by trainers or sports teachers in rnemberikan training or lessons to players or students in the field. This understanding of learning strategies is intended as a learning approach when the trainer teaches dribbling techniques in hockey. Based on this, the approach is defined as a form of business undertaken by the trainer in providing learning or training to players or their students with the goal of training results can be achieved optimally. In an effort to improve the optimal performance of a hockey sport should be a player through the process of learning, coaching and regular training. Learning or training is also not a temporary or incidental activity, because irregular exercise will be less meaningful to an increase in the performance of a sport.

D. Drill Approach

A drill approach is given to train the game focused on mastery of basic engineering skills. This approach emphasizes the achievement of the goal of the player to master the basic techniques of hockey game. This drill method has been acknowledged by many trainers, since the drill approach method can improve skills techniques rather than athletes. As the word drill in Big Indonesian Dictionary is, do the exercises in a short time. Furthermore it is stated that drill is a train (skill, dexterity etc.) takes time [5]. and besides that which is also required in this method is a coach who really has good motion techniques as well. With the mastery of good motion techniques, the trainers will easily provide a good and correct example.

With this drill method the trainer will be able to have the opportunity to train with a sufficient number of athletes at the same time. This drill approach is an exercise method designed as an exercise to improve a person's skills by assigning to his athlete to do the exercises over and over again. With this expenditure is expected to be a skill and physical improvement of the athletes trained. As suggested by Coker that the drill method very effective to achieve the goal of an exercise [4]. And furthermore it is said that in order to maximize the time available, the drill must activate all learners. From these statements we can conclude that the drill method is an appropriate method to be used in the Dribllehoki exercise. And it is also advisable for the trainer to be able to carry out the time by including all athletes in the training process if the exercise wants to be more efficient.

In addition, Coker states that theoretically, the drill method will give the athlete the chance to practice some of his newly trained skills, demonstrating the skills he mastered, and motivating his next training plan [4]. Clearly already what is said by the Coker, that with drill methods of engineering constraints will be faster obtained [4]. With drill is done continuously is expected to get an automatic movement in which the movement made can not be interfered again from other task done simultaneously. Drill approach itself can be used to train all kinds of sports, because the basic motion of a sport should be trained repeatedly in order to get good movement and correct and make the technique into an automatic movement, automatic movement will reduce the workload of the athlete itself. Thus the appearance of the athletes in a game will be confident and better too.

E. Tactical Approach

Skills to demonstrate the ability to process the ball, the performance of a truly full effort with struggle, dynamic movement, and the creation of a beautiful goal, accompanied by tactical surprises, which make the audience amazed to see it, is a distinctive attraction from a hockey game. With these skills, players are required to play as well as possible in a match. In a hockey game, the skills that each player possesses are inseparable from a single team and are not used individually. In other words, the ability of a player, will not be able to achieve goals when playing alone and at will regardless of the needs of the team. Because of that many we meet, a player who mimiliki good skills and talents sometimes not played by the coach because the player can not cooperate with a friend in a match.

With a tactical approach to practice there will be an exercise process that prioritizes teamwork, because in this tactical approach is a game that is shown to train the technical play that is adjusted to the exercise / learning of the player or

the students play with the spirit. The purpose of tactical approach in learning / practice by tomoliyus is to increase understanding of the students about the concept of play through the application of techniques that match the problem or situation in the game [13]. Furthermore it is said: in the tactical approach students are placed in play situations that emphasize on retaining possession of the ball before identifying passing, dribbling or firing exercises [13]. From the above opinion we can conclude that the method of tactical approach exercise is a method of training approach that is designed to train techniques and tactics simultaneously. Because with this tactical exercise approach, the players / students are given the practice as in the actual game, but the game has gone through a modified process. The formulation of the problem in this research are: 1) Is there any difference between technique training method with tactical approach with technique drill method with drill approach to the improvement of basic technique skills of hockey dribbling? This study aims to determine: 1) the difference between the technique technique method using the drill approach with the technique training method using a tactical approach to basic hockey engineering skills.

II. MATERIAL AND METHOD

The method used in this study is experimental, where in the experimental class students are given the method of tactical exercise and the control class is given drill practice method. Furthermore, both classes are given basic technical skills test hockey. And analisys in use is the F test. F test known as concurrent Test or test Models/Test Anova, i.e. test to see how the influence of all free variables together against the variables bound.

III. RESULTS AND DISCUSSION

The difference in the effects of exercise methods with tactical approaches an alternative hypothesis of basic engineering skills of hockey (Ha) that States that the ability of the different techniques of hockey dribbling between groups of students who learn with a tactical method of drill and the drill received, the value of Fhitung is 9,407 > Ftabel = 8.53. If F calculate > from table F, (starting in Ho Ha received) so significant or model can be seen in the columns on the Anova significance (Processed with SPSS, use regression test with Method Enter/Full Model). Significant model for column of significance (%) < Alpha). means accepting the ha refused to ho, so that it can be concluded that there is a significant difference between the drill approaches hokey dribbling skills and tactical approach. This means that the ability of the technique to learn hockey dribbling by using higher tactical methods of the students who learn the drill.

For tactical method column and price drill Ftabel is searched based on dk between columns (numerator = 1) dk in denominator 16 is (3.63). Price F arithmetic> F table then ho rejected and accept Ha. This means that there is a difference in dribbles ability based on training methods. Tactical exercise methods improve dribling skills.

Differences Effect of Exercise Methods With A Tactical Approach to Drill Approaches to Basic Techniques of Hockey Skills. Sport is not only aimed at achieving without a fun process for students. Students need the support of a fun workout environment, cooperation with a fun companion or practice with an exercise setting where students feel they are playing.

On the other hand one of the important aspects that determine the outcome of the exercise that is achievement motivation is dynamic. Required training methods that can provide pleasure for students. One method that can provide pleasure while providing opportunities for students to master dribling techniques is a tactical method. The method can provide fun, break fun with activities and help make quick and precise decisions on the game.

On the other hand, dribbling exercise using a tactical approach loaded with tasks given can stimulate thinking because the game is done really. The students learn to decide and can judge how the movement and appearance in the field. The tactical approach seeks to relate tactical play skills and basic engineering skills by emphasizing the selection of ambient settings that can enhance students' achievement motivation.

IV. CONCLUSION

Tactical method is better than the drill method of dribbling hockey learning result. because there is a significant difference. The tactical method contains students feeling happy and the condition makes students more intense, directed to the goal of exercise, have endurance and able to maintain balance during practice. The tactical approach itself is more directed to the game, so the athlete or student is directed to the real-life situation where the students play but still earnestly to achieve the outcome of the practice, For the extracurricular activity trainer, the result of this research can be a description of the development in providing tactical and drill methods both in teaching and learning process and training. For the School; Schools need to provide trainers who are competent in their fields and have the ability to improve student achievement exercises.MS Word Formatting toolbar.

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The Effect of Endurance Exercises Method to Increase VO2Max Wrestling Athlete in Indonesia

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***Abstract*— The results showed that VO2 Max as a whole result of pretest result 46,95%, result of test of Cycle I increased to equal to 49,43%, and result of Cycle II test become more good again reach 50,21%. The conclusion of this study is that the training interval method can to increase the VO2 Max Atlet Wrestling Program Indonesia Golden Games XXVII Myanmar 2013 so that its durability increases. The study's recommendation is to improve endurance athletes using interval training methods.**

Keywords—VO2Max, endurance, interval training

I. INTRODUCTION

Sports wrestling is rarely heard echo in Indonesia, but the real fact is not so. Although not as popular as football, badminton or tennis, but this type of hard sport also still exist in Indonesia. Since the entry of new types of sports to Indonesia such as sumo, wushu, or other similar sports, wrestling is seeming abandoned. Though the history until the development of this sport in Indonesia through several stages is quite difficult, including its existence is almost completely eliminated since Japan came to bring sports like Judo and Kempo.

Until finally wrestling again popularized in 1959 with the match in Bandung. This physical exercise was also contested in the grand event of ASIAN GAMES IV in 1962 so that Indonesia should briefly establish a special wrestling association to recruit athletes and provide education / coaching for prospective athletes.

The association is called the All Amateur Wrestling Union of Indonesia or abbreviated as PGSI. The association was founded on February 7, 1960 and has hosted this branch sport until now. PGSI is under KONI and regularly conducts athlete training to participate in various championships both regionally and internationally [11].

The ability to work muscles or organs continuously over a period of time without experiencing excessive fatigue, in addition to endurance, endurance is one component of the physical condition that is highly needed in sports wrestling, for optimal athlete performance, recovery and body compositions , athletes need diet and synchronous physical activity [3].

Endurance endurance ability / endurance one can do by measuring VO2Max, understanding VO2Max is a body system that transports oxygen by the blood pumped from the lungs to muscle tissue [1]. VO2 Max is a measure to determine the endurance of one's Kardiorespiratori. VO2 Max is the level of oxygen consumption during exercise. the body's need for oxygen is determined by the intensity (weight) of movement or exercise performance [4].

II. MATERIALS AND METHOD

The method used in this study is the experimental method, Experiments are activities that are planned and executed by researchers to collect data related to the hypothesis. The researcher deliberately and systematically introduces the treatments into natural phenomena and then observes the consequences of the treatment. Data were collected through a 15 minute / balke test to see the aerobic endurance capability of the test performed during preliminary tests, intercultural tests, and final tests, then the data were analyzed to determine the improvement of aerobic endurance. Data analysis using SPSS Program with a significant level of 0.05 to prove whether the action is done on the athlete wrestling is an increase or not.

III. RESULTS AND DISCUSSION

The results showed that VO2 Max as a whole result from pretest 46,95%, result of Cycle I test increased to equal to 49,43%, and result of Cycle II test become more good again reach 50,21%. VO2 Max results For More details can be seen in table 1.

TABLE I. DESCRIPTIVE STATISTICS DEPENDENT VARIABLE: VO2MAX

Test	STYLE	Mean	Std. Deviation	N
Pretest	Gergo Roman	49,6250	1,17333	4
	FreeMan	48,9225	1,99251	4
	FreeWoman	42,3175	5,28747	4
	Total	46,9550	4,57203	12
Test SIklus I	Gergo Roman	51,2875	1,45287	4
	FreeMan	50,9725	2,45490	4
	Free Women	46,0250	1,92787	4
	Total	49,4283	3,09335	12
Test Sik;lus 2	Gergo Roman	52,1075	1,31206	4
	Free Man	51,8700	2,24643	4
	Free Woman	46,6575	2,07842	4
	Total	50,2117	3,15031	12
Total	Gergo Roman	51,0067	1,60754	12
	Free Man	50,5883	2,40058	12
	Free Woman	45,0000	3,71675	12
	Total	48,8650	3,83112	36

From the data above shows that the highest mean Vo2 Max is the Gergo Roman style exercise, which continues to increase from pretest, test result I and II test results, while the lowest is the women's freestyle exercise, To give a clearer picture can be seen in figure 1.

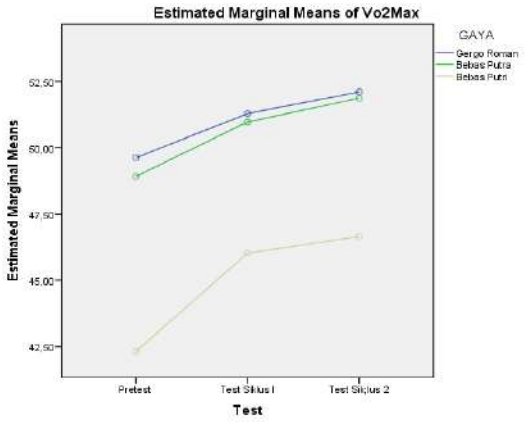

Fig 1. Hypothesis testing

From the calculation of variance analysis obtained summary as in the following table.

TABLE II. TEST OF BETWEEN SUBJECT EFFECTS DEPENDENT VARIABLE: VO2MAX

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	344,973[a]	8	43,122	6,900	,000
Intercept	85960,376	1	85960,376	13754,651	,000
Test	69,347	2	34,674	5,548	,010
GAYA	269,938	2	134,969	21,597	,000
Test * GAYA	5,687	4	1,422	,228	,921
Error	168,738	27	6,250		
Total	86474,087	36			
Corrected Total	513,711	35			

a. R Squared = ,672 (Adjusted R Squared = ,574)

From the table above can be explained things as follows.

a. The value of the Fcorrected model of 6,900 and its significance of 0,000 indicates that there are significant variations of Vo2Max by Test and exercise style at a significance level of 5% (0.05).
b. The Ftest value of 5,548 and its significance of 0.010 indicates that there are significant variations of Vo2Max by Test (Pretest, Cycle I Test and Cycle II Test) and exercise style at 5% significance level (0.05).
c. The Fgaya value of 21,597 and its significance of 0,000 indicates that there are significant variations of Vo2Max based on exercise style (Gergo Roman, Free Putra, and Free Princess) at a significance level of 5% (0.05).
d. The FTest * style value of 0.228 and its significance of 0.921 indicates there is no significant Test and Style interaction in affecting Vo2Max. This means that the Test and Style each independently affect the variation of Vo2Max not interacting with each other.

The results showed the overall VO2 Max results from pretest 46.95%, the results of the first cycle test increased to 49.43%, and the results of the second cycle test to be better again reached 50.21%. VO2 Max.

Seeing the results of the VO2 Max test above shows that the endurance of the wrestling athlete shows that the training interval endurance training methods and training programs provided to athletes are appropriate, that a high degree of aerobic ability is a prerequisite for enhancing performance [5].

IV. CONCLUSION

The conclusion of this study is that endurance training (run interval) can increase VO2 Max Atlet Wrestling Indonesia, VO2 Max increase overall from, result of pretest 46,95%, result of test of Cycle I increased to equal to 49, 43%, and the second cycle test results become more good again reached 50,21%.

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Perception of Athletes And Trainers on Use, Security, and Company Tools of Extinguishers on The Exercise Skills of Bolavoli Motion

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***Abstract*— The problem raised in this study is how the trainer and bolavoli athlete respond to the application and usefulness of the bolavoli thrower on the practice of bolavoli motion skills? The objective is to know the perception of trainers and athletes on the application and usefulness of the ball-throwing tools during bolavoli training. A qualitative research approach was used as a research method with 15 subjects of provincial bolavoli trainers and 40 provincial bolavoli athletes involved as respondents. Data obtained through questionnaires, interviews, and observations as a research instrument, which then performed data processing using descriptive percentage. The results of the study showed that 15 trainers stated that the sprayer tool could be used for motion study exercises and guidance of bolavoli achievement, and could fulfill the need for motion bolavoli skills training. Perceptions of the use of bolavoli launcher are also given by the players as respondents. The results of the assessment showed that athletes stated that the bolavoli launcher was feasible to use, comfortable to use, and safe to use the exercises.**

Keywords— exercises, bolavoli, sprayer

I. INTRODUCTION

The basic pattern of the game bolavoli mentioned PBVSI (1995: 1) that reflects the ball (volley) continuously over the net. While the goal is to skip the ball over the net in order to fall to touch the floor of the opponent's field and to prevent the same effort from the opponent. According to Beutelstahl, technique is a procedure that has been developed based on practice, and aims to find a solution to the problem of certain movements in the most economical and useful way [2]. Furthermore, technical skills according to Reynaud are grouped into two, namely: 1) attacking technique skills consisting of serving, passing, and attacking, and 2) defensive engineering skills consisting of block and dig [9].

Various basic engineering skills absolutely must be learned and mastered to be able to volley the ball according to the technical principle of bolavoli. Through long and continuous practice, the bolavoli athletes learn, master and improve the skills of serve, pass / dig, set-up, spike, and block motion needed in survival tactics and attacking the sport of bolavoli.

It is clear that now the sport of bolavoli is growing rapidly, fast and far more sophisticated. One example is the emergence of a jump-serve and back row attack on serve and spike skills, being a much more dominant factor and making the bolavoli game has changed. This means that coaching needs to be accompanied by an adequate training process, including training facilities for bolavoli motion exercises. In developed countries, bolavoli practice based on science and technology innovation has been widely used. The exercise is done with the tools of science and technology innovation, one of which is a tool pelontar bolavoli. The bolavoli launcher is a set of machines that work mechanically to throw / bolt the ball. The ball of the throwing ball is used for the sake of bolavoli practice.

Boliavoli launchers manufactured and marketed include AirCat Volleyball Machine from Airborne Athletics USA, Inc.1800 East Cliff Road, Suite 11A Burnsville, MN and Attack Volleyball Machine from Attack Volleyball from Sport Attack USA. 40 Verdi, NV (Asian Region in Shibita-cho Miyakonojyou-shi Miyazaki, Japan) [1]. The two machines above are some bolavoli throwers that have been manufactured and used to aid in bolavoli exercises. Developed countries use science and technology innovations to drive successful practice, improve performance, and help learn bolavoli motion skills.

In Indonesia, AW_2016 bolavoli drill machine has been developed. A science and technology innovation exercise tool learns the skills of bolavoli motion. So need a study of how the application and usefulness of this tool in the practice of bolavoli motion skills? The world of sporting achievements is very unique because the performance results are measurable and observable, even presented openly, as well as publicly accounted for, broadcast by the media (print and electronic) and recorded as sports performance data. Therefore, according to Lutan, behind the process of sports coaching is needed the formation of a "growth mind set" that emphasizes the endeavor and ethos of hard work, as a reflection of the champion character, or a culture of accountability that emphasizes the process improvement / improvement in a continuous and systematic way [5].

Achievement sports can not develop on a stand-alone basis so as to require synergy of all stakeholders, in order to ensure sustainable sports development. The lack of sustainable coaching is against the sporting demands of achievement that will only succeed when long-term coaching principles are met. Lutan mentions as a system, sports coaching achievements

involving a number of major components and research results revealed at least 10 major components called pillars [5]. The ten pillars are: financial support, organization and integrated sports policy structure, pemasalan and nurseries, performance development: talent identification and development, elite group achievement: reward system and support in the post-career period, sports infrastructure: training facilities, training and quality of training, quality of competition: national and international standards, scientific research: input of sport science and technology, and media environment and sponsorship.

As often argued by experts: "The sports performance should start from an early age to reach peak performance, which takes place through a continuous coaching process for 10-12 years, or at least 10,000 hours of practice." Therefore the implementation of sports achievement development greatly emphasizes the process, rather than product (result). Furthermore, it is necessary to create an environment and pay attention to the factors that support the quality of athletic training, in order for athletes to learn, practice, repeat the movement and be able to master the techniques of attacking techniques and techniques of survival. The quality of the exercise depends not only on the trainer, but on the interaction of many factors that can affect the performance of the athlete. Bompa (2009: 8) states that the factors that affect the quality of the exercise are: a) the trainer's knowledge and personality, b) facilities and equipment, c) supporting science discoveries, and d) matches or competitions. All that is reciprocal with the ability of athletes based on motivation and talent.

AW_2016 bolavoli drill machine is a work system that aims to throw the ball for the benefit of exercise for athletes in learning the skills of receive-serve, pass / dig, set-up, block and spike bolavoli. The ability of bolavoli drill machine AW_2016 is: capable of catapulting 900 times throw / hour, hold for 3 hours continuously, can give the right throw and steady, maximum throwing speed 98.3 km / hour. This bolavoli aids to meet the training needs of a bolavoli athlete in the practice of bolavoli game motion skills. Exercise facility as one of the supporting factors that determine the quality of exercise including equipment or equipment. So to create a quality practice, the coaching club and coach must pay attention to the availability of equipment or equipment that is adequate for athletes in the exercise.

Practicing and learning bolavoli motion skills is learning motion skills on how athletes can master the movement of receiving service, accepting or passing, feeding, punching and stemming, so that the movements are effective and useful for playing the ball back and forth regularly over the net as well. Cooker (2004: 98) mentions that the steps to acquire movement skills according to Fitts and Posner's Three-Stage Model are: 1) Cognitive Stage, 2) Associative Stage, and 3) Stage Automation.

The first step is the cognitive stage, in which the athlete is introduced to new motion skills and the main task used to develop a sense of the need for motion. In this step the athlete experiments with various strategies, sees and perceives things that hinder and support the movement learned. The second step is called an associative stage. At this stage the athlete begins to choose his motion skills to achieve his motion goals. Characters that arise at this stage include: focused on the chosen motion strategy, there is a lot of repetition of the movement to master its motion strategy, and the increase is slowly. Changes in motion skills can be seen with improved performance, and athletes have a strategy in which motion is possible and selected. Appearance appears to be more consistent and there is a decreased rate of motion errors. The third step is described as the stage of automation. At this stage a high-level appearance is formed and its motion strategy has become an automatic movement. The characteristics of this stage are: 1) the final stage of motion learning is characterized by the ability to perform the movement automatically, 2) in the movement without being affected, although still pay attention to other things, 3) in the process of movement has a lot of memory in the central nervous system 4) this is not all athletes achieve it, 5) automatic movement is not necessarily efficient.

The implementation of sports science in Indonsia is now beginning to develop. However, even though it is not accompanied by the application of high technology, so in its application is not optimal. Infallible Ali (2012: 22) states that a narrow understanding that led to the study of sports science can not develop optimally. This understanding is related to the study of sports science which is only understood as the science of motion and practice. The outside study was considered not a field of sports science. The view needs to be straightened out, given the science of sports has grown considerably away from the understanding.

According to Lutan, the function of sports science and technology is to seek innovation in coaching [5]. If not to the extent of these capabilities, at least the application of science and technology is needed to provide information to make the right decision in the training. In the development of the next science and technology, the existing technology makes sports activity is no longer a heavy activity. Various tools ready to become "weapons"

In the Law of the Republic of Indonesia Number 3 of 2005 on National Sport System chapter XIII article 74 paragraph (3) and paragraph (4) related to Science and Technology Development (Science and Technology) Sport states that: Government, local government, and / or community undertake the continuous development of science and technology to promote national sports; The development of science and technology is conducted through research, assessment, transfer of technology, socialization, scientific meeting, and cooperation among research institutes, both national and international who specialize in sports science and technology; and the results of science and technology development are socialized and applied for the advancement of sport.

II. MATERIAL AND METHOD

A test design is used to find out the perception of usefulness, safety, and comfort of the thrower on the practice of bolavoli motion skills. 40 provincial bolavoli athletes were involved as test subjects (respondents). In addition, 15 provincial-level trainers were involved in the study to make observations and provide assessments.

The instruments used were questionnaires, interviews, and observations. Questionnaires are used to collect information or data from the trainer on the results of the use and performance of the ball launcher. It is also used to gather information on possible adaptation of the tool during use. Observation is used to collect data related to the implementation of the ball launcher. Interview guides are used to explore or supplement data and information from athletes and trainers on the conditions, benefits, and usefulness of the ball launcher. Further data obtained were analyzed by descriptive percentage.

III. RESULT AND DISCUSSION

A. Implementing Tools

The ability of the bolavoli drill machine AW_2016 and its application to the bolavoli exercise, among others: 1) the skills of motion receive the service: give throwing with rotation type rotating or spinning as a service from the opposing team and respondents trying to practice the skill of motion acceptance of service ball, 2) the skill of receiving the attack: giving a flutter like an attack in a ball game with a rotating spinning or spinning ball type and the respondent attempting to practice the skill of the defensive moves of the opposing team's attack; 3) the skill of feeding: giving a flutter like a passionate pass) in a ball game with a rotating or spinning ball type and the respondent tries to exercise the mastery of passing motion skills or feeds the ball in a team so that the ball can be struck by the attacker; 4) the skill of striking or attacking: giving a throw like a u mate of team mates in a ball game with a round ball type and respondents attempting to practice attacking motion skills with a wide variety of ball spools, and 5) motion detrimental skills: to give off like an attack in a ball game with a spinning or spinning ball type and respondents tried to exercise motion control skills to stem the attack of the opposing team.

B. Perception

The perception of 15 trainers related to the use of bolavoli throwers in motion exercises was observed with three aspects, namely guidance of bolavoli achievement, development of sport science and technology, and bolavoli coaching aspect. The results of the questionnaire showed that all respondents (100%) stated feasible with the perception as follows:

1. Guidance of bolavoli achievement: can be used for exercise and improve bolavoli skills, safe and comfortable to be used for exercises to learn bolavoli motion skills, can be used for athletes of sons and daughters, as well as various levels of athletes.
2. Science and Technological Science development bolavoli: can meet the needs during exercise learn bolavoli skills, and can meet the throwing keajegan during use athletes practice learning bolavoli skills.
3. Bolavoli coaching aspect: can be used to practice skills receiving services, receiving attacks, feeding, hitting, and stemming in a game of bolavoli.

Perceptions of the use of bolavoli launcher are also given by the players as respondents. Perception is given by assessing the bolavoli thrower after the respondent tries to use it in the practice of bolavoli motion skills. The results of the assessment showed that all respondents (100%) stated that the bolavoli launcher was feasible with observations on:

1. Utility aspect: can be used to practice bolavoli motion skills. The result of respondent's analysis showed that model product can be used to assist trainer in training process (24%), repeating model ability (20,7%), and model can be used to learn technique (17,2%) are three answer most of the respondents. The respondents' highest answer indicates the model product can meet the needs of the ball throw used by the athlete in learning motion skills or bolavoli techniques. The repetitive nature of the ball ejector model results from the ability of the product to throw the ball continuously. This condition is used trainers and athletes to meet the needs of the exercise. Thousands of ball throws produced by the launcher product used by the athlete to repeat the movement as a training process.
2. Security aspect: safe to use for the practice of bolavoli motion skills. The results of the respondent's analysis show that the safe model product is used for bolavoli exercise because it is not in direct contact (48%), the tool can be adjusted or adjusted (20%), effective design (20%), and unobtrusive tool (12%). The biggest and most convincing respondent answer is the absence of physical contact or touch between the model of the thrower and the athlete during use in the training process.
3. Aspect of comfort: comfortable to use for exercising bolavoli motion skills. The result of respondent's analysis showed that the model product of the convenient ejection device was used for bolavoli practice because the model of the spherical device can be adjusted / adjusted (42.3%), can be used for the attacking and survival training (19.2%), physical condition training (15.4%), stable ball burst (7.7%), and other answers (15.4%) refers to repeatable, coach, and efficient tools. The data shows that the system of speed setting, direction, and throwing angle is the answer to convince respondents to feel comfortable using the model product of AW_2016 thrower. The indirect effect of the use of the model of the ball ejecting device is related to the physical condition. This refers to a relatively rapid repetition of each athlete's motion resulting from the throwing of a modeling product model. This situation requires a good athlete's stamina to always show the performance of the exercise as a demand and goal of the exercise.

The AW_2106 bolavoli drill machine tool can meet the needs of a ball-throw for the practice of bolavoli motion skills, can be adjusted to the angle, direction, and ejaculation aspect, can be used to practice learning the skills of receive, pass / dig, set-up, block, and spike bolavoli, and economical. The practicality and effectiveness of the training tool is shown from the interviews of 40 respondents who have tried the AW_2016 bolavoli drill machine. Interviews show that the AW_2016 bolavoli drill machine is useful for bolavoli exercises. The respondents' highest answer indicates this tool can help the trainer in the bolavoli training process obtained from his ability to throw the ball. AW_2016 drill machine tool capable of throwing the ball continuously and steady so that it has the nature of drilling to meet the needs of burst during exercise.

Fulfill the needs of bursts of balls used by athletes in learning motion skills or bolavoli techniques. This condition is used trainers and athletes to meet the needs of the exercise. Thousands of ball throws are produced by tools used by athletes to repeat the movement as a training process, this is termed drilling. Repetition of the movement by using the ball-throwing out of the tool to learn various motion skills or bolavoli game techniques. AW_2016 bolavoli drill machine is safe for bolavoli exercises, the most responded and convincing answer is the absence of physical contact or touch between the model of the propeller and athlete during use in the training process. This is derived from the ability of the tool that can be positioned, the type of burst, and throw target. In addition, its ability to adjust the direction of throwing, throwing angle, and altitude is the factor of avoidance of physical contact during use in the bolavoli training process. The ability to adjust the speed, direction, and angle of the throw is a factor in the AW_2016 bolavoli drill machine tool. The throwing ball with a choice of speed from 0 to 98 km / h, and the right target due to the direction and angle settings to make the outrage can be used to meet the need for resistance and attack tactical exercises.

The results of throwing the ball used athletes to practice receive serve, block, and pass / dig for defensive tactics. Set-up and spike exercises are an attacking tactic that can be trained with this model of the thrower. The indirect effect of using this tool is related to physical condition. This refers to the relatively rapid repetition of each athlete's motion resulting from the throwing of the AW_2016 drill machine. This situation requires a good athlete's stamina to always show the performance of the exercise as a practice demands.

The practice of bolavoli motion skills is a long process that follows the Fitts and Posner stages. The athlete seeks to recognize, understand, and master the skills of receiving motion, accepting attacks, feeding, hitting, and blocking bolavoli games using bolavoli thrashing media based on the cognition stage, association stage, and then the automation stage. The process of a movement starts from the presence of external or internal signals that enter through the brain nerve which then causes the contraction of a muscle or muscle group. Lutan (1988: 240) states that: the contraction generates sensory information (response-produced feedback) of the muscles and / or from the movements produced by the contracting muscles. The feedback is regarded as information stimuli as well as other stimuli such as light or sound, which then serve as a triger or spur for the next contraction. In the next stage, the muscle contraction also produces a feedback response that spurs the third contraction, and so on until a complete contraction circuit takes place. The origin of the feedback-feed generating sequence of subsequent responses can be from various sources such as muscle contractions, joint receptors, or even from sight and hearing.

Sources of information (stimuli / stimuli) that enter through our hearing or vision are processed in the brain by recognizing and identifying the characteristics of the input first, then our bodies respond well in the form of a movement. The presentation of information processing of bolavoli motion training exercises from ballooning tools can be delivered as follows: first, the athlete captures the information from the spill of the ball and the tasks and functions of motion skills through the sensory organs (eyes, ears, etc.). Some information is filtered (ignored) at the sensory level, then the rest is inserted into short-term memory (consciousness). Short-term memory has limited information maintenance capacity so that its content must be processed in such a way (by repetition or training), otherwise it will disappear quickly. When processed, information from short-term memory can be transferred into long-term memory. Long-term memories (Long-Term Memory) are important in the training process. Long-term storage contains factual information (called declarative knowledge) and information about how to do something (called procedural knowledge). The end of this process is the output, which is the skill of receiving the service, accepting the attack, feeding, hitting, and bolavoli game dam.

IV. CONCLUSION

AW_2016 bolavoli drill machine tool is an innovative exercise, especially training facilities that support athletes learn bolavoli motion skills. This tool has the ability to provide thousands of throwing ball that can be used athletes in the process of continuous training and demands long training time. Research conclusions are a convenient and safe bolavoli thrower model for exercise, can be used for motion-learning exercises, and can fulfill the need for bolavoli exercises. The proposed recommendation is that the model of a bolavoli thrower can be used by trainers and athletes as an alternative to the bolavoli motion exercises..

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The Role of Training of Goal Setting And Muscle Relaxation to Self Confidence of Swimmer Central Java Training Center 2016

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***Abstract*— The purpose of this study is determine the role of training of goal setting and muscle relaxation against self-confidence enhancer swimmer central java training center 2016. The population is swimmer Central Java Training Center 2016 in 2016, which amounted 8 people. Then the sampling technique is total sampling. The main data collection in this research is done by interview and additional data is done by using measuring instrument or self-confidence questionnaire. Qualitative data processing or interviewing is done by making informant answer category. While the quantitative data processing is done by testing the validity and reliability of the athlete self-confidence questionnaire. The results showed that the improvement of mental skills was followed by an increase in confidence of all swimmers. Increased confidence that occurs in Central Java Training Center 2016, swimmer can be seen to improve performance, swimmer proved can improve the record time at best time. But the target or goal setting time record on all athletes has not been able to achieve the goal setting they are targeting. Conclude that the intervention in the form of effective mental training in improving confidence to swimmer. For this study still apply the same mental training to all swimmer. We recommend for individual mental training programs. Subsequent research needs to adjust the giving of the form and the mental skill portion for each athlete.**

Keywords*— *Goal Setting, Muscle Relaxation, Swimmer Confidence

I. INTRODUCTION

Goal setting is one good foundation for achieving success in mental skills training programs. Because that trainers and athletes can achieve success in both techniques, tactics and mental through the goal setting principle. The principle of goal setting is to help the athlete to pay attention to the right behavior to achieve success in the sport, increase the athlete's perseverance in various difficulties, strengthen efforts and achieve results in training and matches (Komarudin, 2013: 63).

In the sport of swimming achievement, athletes must have confidence because of self-confidence have a significant relationship to the performance improvement of athletes. The level of confidence is an indicator of success in every competition, the athlete can carry out his duties properly based on the belief in the abilities that exist in him. Athletes who have confidence will be consistent in the attitude and acting during practice and when competing. It is an athlete's mirror of consistency in its emotional aspect. The athlete who has the confidence will be able to perform interpretation, evaluate his own ability and can drive successful achievement and responsible for what is done and set (Komarudin, 2013: 68).

One of the most important discussions concerning self confidence is about the sources that become an athlete's confidence. By knowing the source of confidence, then the interested parties (trainers, coaches and others) can find out what interventions can be done to improve the athlete's confidence. Proper intervention will certainly have a positive effect on the performance show by the athlete (Juriana, 2012: 4).

Based on the description above, the authors are interested to conduct research entitled "The role of training goal setting and muscle relaxation toward self confidence improvement for swimmer of trainer center of Central java 2016". Based on the problems that have been found, then the formulation of the problem in this research as follows: What is the form of goal setting and Muscle Relaxation intervention training Can Improve Self Confidence for Swimmer of trainer center of Central java 2016 ?

II. MATERIAL AND METHOD

The research Methods is qualitative research, with research design before and after treatment.. A qualitative approach is an appropriate method to develop as a new approach in sports psychology and practice. Because experiences involving activities and body such as athletes are highly individual (Stelter, 2003). In addition to having different characteristics, the athlete's experience is also influenced by the specific situation he is facing. While some quantitative data as additional data or supporting data.

The research have two treatment : 1. Goal setting, 2. Muscle relaxation. Additional data is done by using measuring instrument or self-confidence questionnaire

A. Data Requred

The data used for study consists of several things including:
1. Demographic and athlete performance data
2. Data about athlete's mental skills
3. Data on athletes' self-confidence

The population is swimmer of trainer center of Central java 2016, which amounted to 8 people. Then the sampling technique is the total sampling.

B. Data Collection Technique

The main data collection in this research is done by interview for goal setting and muscle relaxation, additional data is done by using measuring instrument or self-confidence questionnaire.

Further questionnaire as additional data used in this study is a self-confidence questionnaire athlete pool adaptation of State Sport Confidence Inventory or SSCI. The grid of the measuring instrument used is as follows:.

TABLE I. GRID OF SELF-CONFIDENCE QUESTIONNAIRE (JURIANA,2012:38)

Dimensions	Definition	Item Number
Exercise and physical skills	The athlete's belief or trust that he or she possesses the ability to execute the required physical skills to demonstrate successful attachment	1,8,11
Cognitive efficiency	The athlete's beliefs or beliefs that he or she is able to focus, are able to maintain concentration and make decisions to demonstrate success	2,4,5,7,9
Tenacity	The athlete's confidence or trust that he is able to refocus after his appearance, able to immediately rise after a bad performance, can overcome the doubts of problems and decline to show a successful performance.	3,6,10,12,13
		TOTAL ITEMS = 13

C. Instrument Research

The instrument of this research is self-athlete confidence questionnaire which has reliability of r = 0,921 and validity ranged from 0,405 until 0,829 (Juriana, 2012: 39). It shows that the gauge is already consistent and it is appropriate to measure the confidence of the swimmer.

III. RESULTS AND DISCUSSION

In this chapter will describe the implementation and results of interventions that include: the overview of informants, the implementation of the intervention program and the outcome of the intervention program Informant's Overview

TABLE II. PRE TEST FOR BEST TIME

No	Informant	Age	Number Of Competition	Best Time
1	A	14	50 M freestyle	00.27.39
			100 M freestyle	01.01.07
2	B	15	200 M freestyle	02.11.39
			400 M freestyle	04.39.00
3	C	16	200 M butterfly	02.30.55
			400 M IM	05.17.00
4	D	19	200 M breast stroke	02.40.00
			100 M breast stroke	01.16.11
5	E	20	50 M freestyle	00.24.25
			200 M freestyle	01.56.72
6	F	20	200 M butterfly	02.05.70
			100 M butterfly	00.57.02
7	G	24	50 M breast stroke	00.33.43
			100 M breast stroke	01.13.50
8	H	25	100 M back style	01.01.80
			50 M back style	00.28.70

In goal setting training, athletes are given the opportunity to write their targets twice (before explanation and after explanation of goal setting), then the researcher with the help and cooperation with the trainer performs the mental training that is muscle relaxation training. Exercise is done before or after meals.

The results of the implementation of this intervention program are divided into three: 1). changes in informant's mental skills before and after intervention, 2). changes in athletes' self-confidence before and after intervention, 3). change of time record for Goal setting.

A. Changes in Informant Mental Skills

After the training, seven of the eight swimmers experienced an improved goal setting skill, one athlete was an informant whose goal setting skills were lacking, but improved in moderate categories. In addition, relaxation exercises are the most frequent exercises to improve athlete's self-confidence and can decrease anxiety after his body relaxes. The anxiety then turns into self-confidence. Relaxed after relaxation makes the athlete more focused, his movements and swimming styles become more controlled and his body condition after relaxation becomes ready for use in swimming movements, and this makes him feel confident. Then the relaxed state after relaxation makes the athlete no longer has many disturbing thoughts. Here is an overview of skills change informants:

TABLE III. BEFORE AND AFTER FOR GOAL SETTING AND RELAXATION

No	Informan	Before	After
1	A	- *Goal setting* = Less - Relaxation = Less	- *Goal setting* = Good - Relaxation = Medium
2	B	- *Goal setting* = Less - Relaxation = Less	- *Goal setting* = Medium - Relaxation = Good
3	C	- *Goal setting* = Less - Relaxation = Less	- *Goal setting* = Good - Relaxation = Medium
4	D	- *Goal setting* = Less - Relaxation = Less	- *Goal setting* = Good - Relaxation = Good
5	E	- *Goal setting* =	- *Goal setting* = Good

		Medium - Relaxation = Medium	- Relaxation = Good
6	F	- *Goal setting* = Medium - Relaxation = Medium	- *Goal setting* = Good - Relaxation = Good
7	G	- *Goal setting* = Good - Relaxation = Medium	- *Goal setting* = Good - Relaxation = Good
8	H	- *Goal setting* = Medium - Relaxation = Medium	- *Goal setting* = Good - Relaxation = Good

Based on self-confidence questionnaires, it is known that there is a change of confidence level before and after intervention. Confidence score after intervention is higher than pre-intervention score, more can be seen in table as follows:

TABLE IV. PRE TEST AND POST TEST SELF-CONFIDENCE

No	Informant	Age	Pre Test Self-Confidence	Post Test Self-Confidence
1	A	14 thn	86	105
2	B	15 thn	99	102
3	C	16 thn	93	95
4	D	19 thn	90	101
5	E	20 thn	92	94
6	F	20 thn	106	107
7	G	24 thn	113	115
8	H	25 thn	101	111

B. Change of Informant Time Record

Time Based on the results of the PON (national sports week) of September 2016, it is known that after attending mental training, all athletes have not been able to reach the target of the prescribed time. But there are four athletes experiencing the best-time improvement in the primary number, 3 athletes having the best-time improvement on another number, and one athlete has not improved best-time. However, all athletes admit that they are better at competing after a mental training. Swimmers feel more energized but able to control themselves to stay calm, relaxed and concentrated. Furthermore, the acquisition of swimmers' time records to informants of this research is as follows:

TABLE V. CHANGE OF TIME RECORD

No	Informant	Competition Number	Best Time	Time Target	Results of The P0N
1	A **	50 M freestyle	00.27.39	00.26.80	00.27.68
		100 M freestyle	01.01.07	01.00.50	01.00.44
2	B ***	200 M freestyle	02.11.39	02.08.00	02.10.37
		400 M freestyle	04.39.00	04.36.00	04.39.00
3	C ***	200 M butterfly	02.30.55	02.26.00	02.27.58
		400 M IM	05.17.00	05.10.00	05.28.00
4	D **	200 M breast stroke	02.40.00	02.37.00	02.41.00
		100 M breast stroke	01.16.11	01.14.07	01.15.83
5	E	50 M freestyle	00.24.25	00.23.90	00.24.70
		200 M freestyle	01.56.72	01.53.80	01.58.18
6	F ***	200 M butterfly	02.05.70	02.00.00	02.04.53
		100 M butterfly	00.57.02	00.55.25	00.56.94
7	G ***	50 M breast stroke	00.33.43	00.32.00	00.33.38
		100 M breast stroke	01.13.50	01.12.00	01.12.44
8	H **	100 M back style	01.01.80	00.58.56	01.01.58
		50 M backstyle	00.28.70	00.27.20	00.27.92

Description: ***) has a time-lapse repair in the main style
**) encountered a timing improvement on the second style

In mental training has not been done specifically by the coach to accompany physical exercise in athletes so far. Clearly the reality of mental exercise in sport should be considered as important as physical exercise. Furthermore, mental training interventions conducted in this research are trying to contribute to the development of sports, especially in order to increase for Swimmer of trainer center of Central java 2016.

The athletes after implementing the intervention program or completing the training phase, then follow the race on PON XIX in Bandung West Java in 2016. This study limits the role of mental training in improving athlete's confidence. The results showed that the improvement of mental skills was followed by an increase in confidence of all swimmers.

Increased confidence that occurs for Swimmer of trainer center of Central java 2016 can be seen to improve performance, proved athletes can improve the record time at best time. Therefore, mental training should be done continuously by athletes in order to have a positive impact on performance improvement or improvement of time records at best time.

Then the target or goal setting time records on all athletes have not been able to achieve the goal setting they are targeting, according to researchers' observations of athletes have not been able to achieve goal setting because many factors that influence among them are very cold water conditions, weather that does not support especially frequent rain, health conditions, food consumption, geographical location of Bandung as a highland that resulted in athletes must struggle to adapt to the environment. Another factor is there are some athletes who keep track of time for targets or goal setting too high, which results in heavy athletes to be able to achieve the time already specified. But seven out of eight athletes can improve their best time.

Although the improvement in mental skills is followed by an increase in the confidence of all swimmers, but each swimmer feels certain mental exercises that play the most role in improving his confidence. This is very natural because experiences involving activities and bodies such as athletes are

highly individual (individual defferences). In addition to having different characteristics, the athlete's experience is also influenced by the specific situation he is facing.

IV. CONCLUSION

Conclude that the intervention in the form of effective mental training in improving confidence to swimmer. For this study still apply the same mental training to all swimmer. We recommend for individual mental training programs. Subsequent research needs to adjust the giving of the form and the mental skill portion for each athlete.

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The Impact of Aqua Jogging Exercise on Hematological Response in Obese Women

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***Abstract*— This study aims to determine the effect of aqua jogging on the hematology in obese women. Experimental Randomized pre-test post-test control group design, 36 obese women, age 45-50 years, divided into 3 groups, aqua jogging, resistance training and control (n = 12). Body Mass Index (BMI) hematological blood measured before and after treatment. Hypothesis test using One Way Anova test. The hematologic change of the aqua jogging group was higher than resistance training and control ($p<0.05$). In contrast, the increase in erythrocytes in the resistance training group was higher than aqua jogging and control ($p <0.05$). Aqua jogging affects the hematological levels in obese women.**

Keywords*— body mass index, hemoglobin, hematocrit, erythrocyte

I. INTRODUCTION

Obesity is a worldwide health problem. In Indonesia, Riskesdas records that there are more than 40 million obese or overweight adults[1]. Obesity conditions occur when the intake of the number of calories consumed exceeds the number of calories expended in a long time[2,3]. Although genetic factors influence obesity, but diet and physical activity determine an individual eventually becomes obese. Structured physical exercise can improve or maintain body fitness and reduce obesity[4]. Physical exercises can be grouped into several categories, depending on the purpose of the exercise, so as to affect the physiological changes in the whole system of the body, especially the blood hematological picture. The hematologic system consists of all blood cells, the bone where the mature cells grow and the lymphoid tissue where the blood cells are stored if they are not circulating[5,6]. The hematology system is designed to carry oxygen and nutrients, transport hormones, remove waste products and deliver cells to prevent infection, stop bleeding and facilitate the healing process. Blood also allows the body to feed and heal itself and connect between body parts[7]. Hemoglobin is one component of blood hematology and composed of red blood cell components that can bind oxygen. It underlies that hemoglobin has an important role in sports, especially long-term sports. Long-lasting exercise requires sufficient energy and lasts longer to move muscles. The energy used to move the muscle is produced by burning food with oxygen previously carried by hemoglobin. Therefore, hemoglobin plays an important role in the formation of energy, especially aerobic energy systems[5,6]. The effect of exercise on the body that occurs as a result of exercise is determined by the intensity of the exercise, the intensity of the mild to moderate exercise is highly recommended in obese people, as well as in exercises with too much exercise intensity / weight then the resulting effect is different [3,4]. Exercise or physical exercise should be done regularly to make the body more healthy and fit. But in people with obesity or overweight conditions, not all exercise is good to do. Because often this activity actually raises new problems in the joints, especially injury to the knee and ankle because of excess weight [8]. Exercise is appropriate and recommended for the condition of obesity is with exercise in the water sport [7,9]. Movements that can be done in the water include aqua jogging, aqua run, aquarobic or ro ad by the pool. The purpose of this research is to know the effect of moderate intensity aqua jogging exercise on hematology (levels of erythrocytes, hemoglobin level, and hematocrit value) in obese women. Aqua jogging is a form of slow-running exercise done in water[10]. While doing aqua jogging, the feet touch the bottom of the pool, making it safe from injury. The key to aqua jogging is to keep the upper body straight and not too forward, this movement is slightly different from the movement of the road on the ground. Another movement in aqua jogging is knee position should be raised higher and like kicking water, this movement allows the body to stay upright so that aqua jogging movement can be done as running on land[11,12].

II. MATERIALS AND METHODS

A. Participants

36 obese women (BMI>25kg/m^2), aged 45-50 years, who had not attended gymnastics for at least 6 months prior to the study. The participants were divided into 3 groups: (1) aqua jogging 4 times / week for 8 weeks (n = 12), and (2) resistance training 4 times / week for 8 weeks (n = 12) and control group (n=12).

B. Research procedure

Before treatment, the participant is informed about all procedures and benefits related to the research through verbal and written communication, in accordance with the procedure approved by the ethical research team of Dr. Kariadi, Semarang. Participants signed informed consent before being

given treatment. Initial inspection is done at the first meeting in the morning. Body mass index examination and body composition using Body Composition Monitor (Omron HBF-375).

C. Aqua jogging Procedure

Increasing heart rate during exercise in the water is more difficult than when exercising on land. Because 65-95% body cells consist of water, the blood circulation during exercise in the water gets better, meaning that when doing the exercises in the water the heart does not have to pump hard to circulate oxygen. Heart rate monitors are performed every 5 minutes of the exercise period. Aqua jogging given in moderate intense (75% HRmax) 4 times a week (1 hour at a time) for 8 weeks.

1. 10 minutes (combination of static and dynamic exercise)
2. 10-20 minutes, first core exercise, combination of aqua jogging and stretching movements.
3. 25 minutes of second core practice combination of formation exercises by hand in the air (feet continue to perform running motion in the water.
4. 10 minutes of cooling down exercise, using fun games continued cooldown.

D. Resistance training

Four times a week (1 hr. at a time) for 8 weeks. Treatment begins in the first week after the pre-test. Heating using treadmill for 15 minutes, continuing endurance training program 8-13 times repetition with exercise 50-75% from maximum repetition amount of each participant. Treatment is given 3 sets of repetitions of leg press movement, leg curl, chest press, latissimus pulldown, shoulder press, bicep curl and crunches. progressively and progressively the program for 8 weeks from the entire program.

E. Pre-test and Post-test

Pre-test measurements first day before treatment. Post-testing performed at the last meeting of the exercise after 8 weeks for three groups. Post-test measurement is identical to pre-test (body mass index, hemoglobin level, hematocrit and erythrocyte).

F. Statistical analysis

Statistical analysis using one-way ANOVA and statistical analysis using SPSS software version 21 (SPSS Inc., Chicago, IL, USA). Statistical significance is set at $p < 0.05$ and the data is presented as the mean and standard deviation.

III. RESULTS AND DISCUSSION

Exercise is a stressor for the body, the body is forced to perform more activities than usual. More activity requires more oxygen supply, especially activity using aerobic energy system. Exercise not only requires more oxygen but can also produce free radicals in the body. During exercise the body will produce reactive oxygen species (ROS), which are free radicals. Even when the body is inactive, a small amount of ROS is still produced. ROS can disrupt the physiological state of the body. This condition makes the body will respond by enhancing the activity of superoxide dismutase (SOD) and protective enzymes in the blood. In addition, high ROS effects can lead to high hemoglobin breakdown. High oxygen consumption and the presence of free radicals in the body can lead to changes in the suitability of hemoglobin during exercise [13,14]. Changes due to aqua jogging exercises are presented in figure 1.

Variable	Aquajogging Group (n=12) (Mean ± SD)	Resistance Training (n=12) (Mean ± SD)	Control group (n=12) (Mean ± SD)	p
Age	46.74 ± 1.30	46.49 ± 1.30	46.79 ± 1.35	0.225
Calori (ccal)	21.25 ± 165.81	2157 ± 119.97	2134 ± 136.11	0.112
BMI (kg/m2) pre-test	31.29 ±0.98	31.72 ± 1.13	32.47 ± 1.55	0.319
BMI (kg/m2) post test	30.29 ± 1.15	32.86 ± 0.93	32.46 ± 1.54	0.000*
Haemoglobin (g/dl) pre-test	12.90 ± 0.76	12.97 ± 1.11	12.88 ± 0.82	0.779
Haemoglobin (g/dl)post-test	15.00 ± 2.83	13.97 ± 1.18	12.49 ± 0.84	0.001
Hematocrit (%) pre-test	38.80 ± 2.77	38.37 ± 2.44	35.77 ± 1.31	0.116
Hematocrit (%) post-test	43.96 ± 2.25	41.80 ± 3.17	34.89 ± 1.31	0.000*
Eritrocyte (µl) post-test	4.50 ± 0.40	4.54 ± 0.19	4.29 ± 0.15	0.038
Eritrocyte (µl) post-test	4.59 ± 0.83	5.01 ± 0.18	4.22 ± 0.57	0.000*

Fig. 1 General characteristics of the subjects (n=36)

Age of the participants, caloric intake, none were statistically different, while Body Mass Index, hemoglobin, hematocrit and erythrocyte levels after exercise were significantly different ($p < 0.05$). Body mass index in each aqua jogging group, endurance training and control group of (-1.01 ± 0.70; -1.14 + 0.73; 0.01 + 0.01; $p < 0.05$) Increased hemoglobin levels in the aqua jogging group, endurance training and group control (2.10 ± 3.03, 1.50 + 0.39, 0.30 + 0.15, $p < 0.05$). Increased hematocrit level in aqua jogging group, endurance training and group control (5.15 ± 2.63; 3.43 + 5.15; 0.88 + 0.34; $p < 0.05$). Increased levels of erythrocytes in aqua jogging groups, endurance training and group control (0.09 ± 0.63; 0.46 + 0.6; 0.07 + 0.54; $p < 0.05$). Increased hemoglobin levels a significant in aqua jogging were higher than the resistance training and control group.

A. Body Mass Index

Changes in BMI in aqua jogging exercises caused by weight loss and changes in body composition, there is a loss of large amounts of water, electrolytes, minerals and proteins located in the fat tissue accompanied by the use of stored liver and muscle glycogen. For each loss of 1 g of glycogen is always accompanied by a water loss of 2.5 grams. Skeletal muscle contractions (40%) of all body tissues require energy source substrate [15] energy reserves in skeletal muscle are required to meet energy requirements during contractions. One of the fulfillment of these sources is through the mechanism of lipolysis. Lipolysis occurs by epinephrine exposure through the mechanism of activity of beta adrenergic responses secreted during stress on physical exercise and immediately after physical exercise [16,17]. Increased lipolysis in physical exercise may decrease adipocyte fat content in adipocyte cells, decrease in adipocyte size further leads to a decrease in fatty tissue mass. The energy used for aqua jogging exercises mainly comes from fat, because fat will produce more energy than carbohydrates and proteins [18]. The results of this study supported previous research that physical exercise 25% -60%

VO2Max increase fat oxidation 5 -10 times. Increased lipolysis occurred after 30 minutes in untrained subjects and in the untrained subjects lipolysis was slower[19,20] Increased body mass index in the resistance training group is associated with weight gain[21]. Resistance training directly affects the muscles by increasing the number of sarcomeres and carbon fibers, i.e. actin filaments and myosin's required for muscle contraction. The addition of new muscle fibers causes increased muscle strength resulting in weight gain. Another study reported that muscle glycogen increased from level of 13-15 grams / kg of muscle to 40 grams / kg muscle or 2.5 times as a result of exercise[22].

B. Hemoglobin

Hemoglobin is a globular molecule formed from four sub units. Each sub unit contains a hem that joins the polypeptide. Hem is a porphyrin-containing derivative of iron. The overall polypeptide is expressed as a part of the globin of the hemoglobin molecule. There are two pairs of polypeptides in each hemoglobin molecule, two sub-units containing another polypeptide. In hemoglobin in normal adult humans (hemoglobin A/ Hb A) two types of polypeptides are called α chains, each containing 141 amino acid residues and β chains each containing 146 amino acid residues. [5,23] The measured hemoglobin levels are in red blood granules. The number of hemoglobin in normal blood is about 15gr every 100 ml of blood and this amount is usually called 100% [24] The threshold limit for hemoglobin level is >13 gr / dl for adult males and >12gr / dl for women. The range of normal hemoglobin levels for children 12-14 years is between 12-15 gr / dl. As for men 15 years and over have a range of hemoglobin levels 13-16 gr / dl. The hemoglobin level in the blood of the athlete should be normal. If the hemoglobin level is below the normal limit, then an athlete cannot meet the necessary energy requirements. However, levels of hemoglobin that exceed the upper limit of normal harmful to the athlete. The condition is because during practice there will be saturation of hemoglobin in the blood, on the other hand the partial pressure of blood and heart rate is also increased. This can be harmful to the body because at any time can occur sudden heart failure. Moreover, with conditions of high hemoglobin levels that allow saturation to occur faster and more saturated than low hemoglobin levels. This situation must be anticipated by the athlete. Therefore, hemoglobin levels should remain normal in the blood.

C. Hematocrit

Levels of hematocrit in aqua jogging and resistance training groups showed that there was a significant difference between the hematocrit value in the initial test and the hematocrit value after the first eight weeks as well as the experimental group there was a very significant change. [25,26] After 8 weeks of striking exercise, aerobic exercise may be compensated by increased erythrocyte activity in the formation of erythrocytes. Another possibility is that the above exercises have not been able to increase the activity of erythropoietin, but there is a change of hematocrit (from normal to high) so that the amount of erythrocytes increases, as a result of an increase in blood hematocrit[14,27]. This exercise can also be affected by the modulator that regulates the water composition in the body, so that the process of decreasing the water in the blood for each individual is different with the final effect of the blood hematocrit level constantly increasing, even apparent at the beginning of the exercise (pre-test). Furthermore, this exercise is done over a period of time physiologically will be adapted as an activity that gives effect to the increase of erythrocytes. [28]Other possibilities are caused by: poor diet control, behavioral influences and environmental changes that are not well controlled.

D. Erythrocyte

There was no significant difference between erythrocyte level in pretest and erythrocytes after the first eight weeks, even up to eight weeks later, whereas based on the results of the test on the variables of erythrocytes in the treatment group, there was no significant difference between erythrocyte preliminary test and erythrocyte level after eight weeks of exercise, also on the final test. The above condition may be due to the doses that are capable of stimulating the erythrocyte-forming components to work optimally, whereas theoretically the opposite is that oxygen levels of the muscles in the exercise may be expected to decrease sharply during exercise and the pressure of carbon dioxide in venous blood increases well above normal [7] so the erythrocyte-O2 bond tends to be weaker than the erythrocyte-CO2 bond, and as a balancing of the blood-related erythrocytes breakdown during heavy exercise, moderate intensity exercises allow the replacement of erythrocytes to become new and eliminate new blood fragility due to strenuous exercise[29].

IV. CONCLUSION

The continuous bout of exercise was a good control for the high intensity, repeated Wingate exercise bout since both tests accomplished the same amount of work. This allows the effects of intensity to be compared while factoring out duration of exercise.

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Differences between Road Bike and Mountain Bike on Decreasing of Blood Sugar Level after Cycling For 30 Minutes

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***Abstract*— This study aims to determine the difference in blood sugar level decrease after cycling for 30 minutes using road bike and mountain bike. The concept of measurement of blood glucose level using glucometer and it is taken after the sample doing cycling for 30 minutes. This Quasi experimental research was conducted on 30 people of sample where each group consists of 15people. This research is done with purposive sampling technique. The results showed that the average decrease in blood sugar level after 30 minutes of cycling using mountain bike is 23.4 mg /dl while the road bike is 30.3. Statistical analysis using independent sample t-test results show that there is a significant difference blood sugar level decreasing between cycling for 30 minutes using a road bike and mountain bike.**

Keywords—blood sugar level, cycling, mtb, roadbike introduction

I. INTRODUCTION

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood sugar. Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels.

Diabetes is recognised as the world's fastest growing chronic condition. The number of people with type 2 diabetes is growing in each country. In 2013, diabetes caused 1.5 million deaths globally. Higher blood glucose levels also caused an additional 2.2 million deaths, by increasing the risks of cardiovascular and other diseases. (WHO Fact Sheet of Diabetes, 2017)

Now a day many people aware of diabetes risk for their life. People try to get better life and doing some sport to reduce the risk of diabetes. Cycling is on of the most popular sport among urban citizen. There are many various of cycling activity but most of the are Road bike and Mountain Bike.

Road bike and Mountain Bike have many different characteristics that affect our health phisically and phisiologically. The main effect of cycling is can reduce the blood sugar level in our body. There must be different affect of cycling for 30 toward blood sugar level between road bike and mountain bike.

II. MATERIALS AND METHODS

This study aims to determine the difference in blood sugar level decrease after cycling for 30 minutes using road bike and mountain bike. Subject of this Research are male student 16-18 years old, BMI between 20-23 and a reguler cyclist for each type of cycling.

The concept of measurement of blood glucose level using glucometer and it is taken after the sample doing cycling for 30 minutes. This quasi experimental research was conducted on 30 people of sample where each group consists of 15 peoples.

This research is done with purposive sampling technique. Data analysis conducted by Independent sample t test to determine differences between Road bike and Mountain Bike in decreasing blood glucose level.

III. RESULT AND DISCUSSION

The results of this research showed in the table below.

TABLE 1. DESCRIPTION OF BLOOD GLUCOSE LEVEL BEFORE AND AFTER CYCLING FOR 30 MINUTES

Road Bike			MTB		
Before	After	Delta	Before	After	Delta
113	88	25	106	90	16
112	87	25	107	91	16
116	91	25	105	89	16
115	90	25	103	87	16
117	92	25	104	88	16
100	75	25	106	90	16
105	80	25	107	91	16
109	84	25	103	87	16
109	84	25	101	85	16
102	77	25	102	86	16
110	85	25	103	87	16

99	74	25	105	89	16
105	80	25	106	90	16
112	87	25	107	91	16
104	79	25	106	90	16

TABLE 2. COMPARISON BETWEN ROADBIKE AND MTB

Type	Mean	SD	SE
Roadbike	30,3333	8,58293	2,2161
MTB	23,4667	4,47001	1,15415

The results showed that the average decrease in blood glucose level after 30 minutes of cycling using mountain bike is 23.4 mg / dl while the decrease in blood glucose levels using road bike for 30 minutes is 30.3 mg/dl.

TABLE 3. T-TEST FOR EQUALITY OF MEANS

t-test	t	df	p-value	Mean Difference
Value	2,748	21,074	0,012	6,86667

T-test show that the p-value is lower than alpha (0.05) so there is a significant difference in the decrease in blood sugar level between cycling for 30 minutes using a road bike and mountain bike. Thus we can noted that Road bike give a better effect in decreasing blood glucose level than MTB.

Blood is a fluid that flows in the vascular system found in humans and animals [5]. Blood is a vehicle or medium for transportation of nutrients throughout the body. Function in the blood transports oxygen, nutrients and waste products of metabolism from the heart throughout the body and back again to the heart [10]

At this moment, nearly 10 percent of the population—are living with diabetes. The Center for Disease Control and Prevention projects that up to one in three Americans will have diabetes by 2050. Scientists are still trying to figure out what exactly is going on (diet and lifestyle certainly play large roles), but one thing is for certain: A lot of people are living with a fairly complex condition, and the situation will worsen. [WHO, 2017]

Bicycling at a speed between 12 and 14 mph helps a 175-pound person burn about 346 calories, according to HealthStatus. The same person burns about 420 calories in 30 minutes of pedaling at a pace of 14 to 16 mph. If you aren't interested in bicycling on the road, swap your road bike for a mountain bike. In 30 minutes of mountain biking, a 175-pound person burns about 336 calories. At the gym, the same person burns about 451 calories pedaling a stationary bike at a vigorous pace. [6]

Riding bicycle is an effective way to improve overall health. As a low-impact sport, bicycling won't lead to joint pain as burn calories, build muscle and strengthen the body. This activity also improves cardiovascular health, mobility and bone strength, while helping reduce the stress. [6].

This research showed relevan result with E.H. Azhar .The results showed that cycling for 20 minutes affect changes in blood sugar levels significantly (p=0.000). The average reduction in blood sugar levels after the intervention is 25.0 mg / dl. Cycling for 20 minutes if done regularly can help keep blood sugar levels in the normal rate. [4]

But showed some irelevan result with Rohankar, et.al that stated that walking and yoga Exercise are more significant as compared to the swimming and cycling Exercise and lead to develop proper glucose control [9].

IV. CONCLUSION

T-test results show that there is a significant difference in the decrease in blood glucose level between cycling for 30 minutes using a road bike and mountain bike, which is cycling for 30 minutes using road bike showing the bigger decrease of blood sugar level. It is statistically approved that road bike is more efficient to reduce blood glucose level than mtb.

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Personality Profiles Using MBTI Test for Sport Talent Identification for Students

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***Abstract*— Making an accurate and valid prediction about an athlete's long term success in professional sport is likely a difficult aspect of professional coaches' role. To date however, personality inventories have yet to become common place within this evaluative process; and thus, their predictive utility within the talent identification process has not yet been adequately tested [1]. This study described of personality profile for talent identification for elementary and junior high school students in Magelang. Myers Briggs Type Indicator (MBTI) used for measure a psychometric personality. 354 Students in Magelang (205 male, 149 female) filled out the MBTI. In present research work it was found that male students of elementary school were having a significantly higher preference of I and S than male students of junior school who were having preference of T and P. Additionally it was found that the female students of elementary school were having a significantly higher only on attribute of F, than their female counterparts of junior students in whom E, N and J attribute was high. ESTJ type was found to be the dominant one in the Magelang students' population followed by ESTP type.**

Keywords— talent identification, personality, student

I. INTRODUCTION

Knowing sports talent since early has many advantages. From an economic point of view, the success of the national sports industry relies heavily on the identification and development of successful athletic talent. For the year 2016-2017, The National Federation of State High School Associations [2] reports that 7.963.535 high school students participated in high school sports. While in Indonesia especially in Central Java, low status in physical activity of high school students [3]. These number indicates that less than 1% of all athletes participated at school will continue into college. Even fewer athletes will have the ability to become professional athletes [3, 4]. For example, research has proven the positive effect of athletic participation in improving kinesthetic skills, social development, and academic outcomes [5, 7]. Additionally, Sport is a promising setting for obesity prevention among youth [8, 9].

Athletic talent identification is of particular interest to coaches, researchers, parents, and educators alike. Some survey of elite young athletes found that parents were the strongest influence on the initiation of a sport (gymnastics, tennis, swimming, soccer) while coaches were the strongest influence on their decision to perform intense training [10]. Research findings suggest that student athletes who perceive they have high ability levels are more likely to maintain participation in sports activities [10, 11].

Physical education (PE) teachers are the first to identify talented students [12]. While, some study found the majority of subject leaders claimed to identify talented students according to their current levels of achievement, whilst only a small percentage based identification upon students' potential to achieve. The most common criteria for assessment were a performance in school sport and club sport. Its indicated that the

II. METHODOLOGY

A. Study Design and Sampling Procedure

The method used in this research is survey method with ex post facto research design. This is used to determine the personality profile of students in Magelang, Central Java. A total of 354 students (251 elementary, 103 junior, 205 males, and 149 females) composed the sample. All individuals were informed about the objectives of the research and that data would only be used for research purposes and generally analysed, and they signed a consent form to participate in this study. Samples obtained students from 14 districts in Magelang.

B. Instrument Development and Data Collection Procedure

The instrument used was the reviewed Indonesian version of the Myers Briggs Type Indicator (MBTI) containing 60 questions. The MBTI involves 8 different personality "preferences." The preferences are organized into 4 dichotomies (contrasting categories) with subcategories rating key aspects of personality, including styles of perception (P), sensing (S), intuition (N), judgment (J), feeling (F), extraversion (E) and introversion (I). And being applied just once, and also have 0,6 to 0,8 scale reliabilities [13].

Fig. 1: Dichotomies of MBTI [13]

Procedure Questionnaires were administered to subjects within 15-20 minutes and the nature of study was described at the top of the questionnaire to the subjects. Participant filled out a multiple choice question; there are no right or wrong answers. The MBTI instrument is not a test. Subject select the answers that best fit for them. Investigator collected the questionnaires from each PE teachers after completing the questionnaire.

C. Data Processing and Analysis

For the analysis of the personality profiles for students talent identification, the descriptive percentage analysis was initially used (average and standard deviation) for the behavior of each variable to be studied. In order to describe the data and differences the t-test was used. At the significance level of 0.05 was used in order to determine the differences between study groups. The statistical program used was the SPSS version 19.0

III. Result and Discussion

The socio-demographic sample is shown in Table 2, i.e.: the total number of samples of 354 students (251 elementary, 103 junior, 205 males, and 149 females).

TABLE I. : General characteristics of the sample.

Districts	SD	SMP	Total	M	F	Total
Tegalrejo	19	0	19	13	6	19
Secang	20	0	20	2	18	20
Borobudur	19	0	19	10	9	19
Bandongan	19	0	19	15	4	19
Mungkid	20	41	61	24	37	61
Ngluwar	11	0	11	5	6	11
Muntilan	0	21	21	13	8	21
Mertoyudan	0	19	19	15	4	19
Salaman	20	22	42	30	12	42
Tempuran	21	0	21	10	11	21
Candimulyo	21	0	21	16	5	21
Salam	21	0	21	19	2	21
Magelang	20	0	20	10	10	20
Kota Magelang	40	0	40	23	17	40
Total	251	103	354	205	149	354

Note: SD: elementary school; SMP: junior high school; M: male; F: female.

The foremost aim of the study was to identification of the data which was analyzed through percentage distribution. The table 2 reported of the percentage distribution personality profile of all 354 students. ESTJ (type was found to have the highest percentage in the total sample. And the least was INFJ and INTP type.

TABLE II. : The percentage distribution of elementary and junior school students.

Type	SD		SMP		Total
	M	F	M	F	
ISTJ	2,8	2,5	0,8	1,1	7,3%
ISFJ	3,1	1,4	0,6	0,0	5,1%
INFJ	0,3	0,0	0,0	0,0	0,3%
INTJ	0,6	0,8	0,3	0,3	2,0%
ISTP	3,1	0,6	0,6	0,3	4,5%
ISFP	0,8	1,1	0,0	0,0	2,0%
INFP	0,3	0,3	0,0	0,0	0,6%
INTP	0,0	0,0	0,3	0,0	0,3%
ESTP	4,8	1,7	2,8	0,8	10,2%
ESFP	2,5	0,8	1,1	0,3	4,8%
ENFP	0,3	0,8	0,3	0,8	2,3%
ENTP	1,7	0,8	1,1	0,3	4,0%
ESTJ	9,9	9,6	6,5	5,6	31,6%
ESFJ	5,9	6,2	0,3	2,0	14,4%
ENFJ	2,5	1,4	0,0	0,3	4,2%
ENTJ	3,1	0,8	1,4	1,1	6,5%
Total	41,8%	29,1%	16,1%	13,0%	100%

From table 2 reported that the highest percentage of students in talent identification program were ESTJ's followed by ESTP and ISTJ serially. The percentage for the four respective dichotomies e.g. E/I, S/N, T/F and J/P showed on table 3. It's reported for each sample of gender for each school criteria.

TABLE III. : The percentage of eight personality variable

	SD		SMP		Total	P
	M	F	M	F		
Extrovert (E)	66,7	82,4	80,8	88,5	77,5	,000
Introvert (I)	33,3	17,6	19,2	11,5	22,5	,021
Sensing (S)	79,1	78,9	76,9	67,7	77,1	,000
Intuition (N)	20,9	21,1	23,1	32,3	22,9	,003
Thinking (T)	62,2	58,3	86,0	73,9	66,4	,002
Feeling (F)	37,8	41,7	14,0	26,1	33,6	,017
Perceiving (P)	32,4	21,4	38,6	19,6	28,5	,009
Judgment (J)	67,6	78,6	61,4	80,4	71,5	,001

Note: SD: elementary school; SMP: junior high school; M: male; F: female; p: sig. (0,05)

From the table 2 and table 3 showed the percentage of male and female students of elementary and junior schools were compared for the percentage points of their corresponding parameters of E/I, S/N, T/F and J/P:

The first dichotomies (direction of energy and attention focus) highest percentage of extrovert (E) was female student of junior school (88.5%), and the lowest was male student of elementary school (66.7%). And the highest percentage of introvert (I) was male students of elementary school (33.3%) and lowest was female student of junior school (11.5%).

The second dichotomies (how to absorb information), male students of elementary school has highest percentage on sensing (S), and female students of junior school has high percentage on Intuition (N). Third dichotomies (how to make decision), the highest percentage on thinking (T) was male students of junior school, and feeling (F) was female students of elementary school. For the last dichotomies (approach of outward action), perceiving (P) has highest percentage by male students of junior school, the contrary of sub-category was judgment (J) by female students of junior school.

The psychology of personality is concerned with these individual differences. One approach involves looking at personality traits, stable aspects of personality with a partial genetic basis. The most influential trait theories are those of Eysenck, Cattell, and Costa and McCrae [14].

Today, many companies are asking their workers to take personality tests before they decide on the right job positions. This became a popular trend in the world of sports. Many trainers and sports organizations require athletes to take this type of test in order to find out if they will be good for their team and have the right character according to the sport they choose [15].

Various instruments for knowing one's personality have been researched by the researcher. The Myers Briggs Type Indicator (MBTI) [13,16]; the SPQ-20 (Myskillprofile,2016); Minnesota Multiphasic Personality Inventory (MMPI), the Sixteen Personality Factor Questionnaire (16PF), the Comrey Personality Scales (CPS), among many others [17, 18]; Dominant, influence, steadiness and conscientiousness or called by DiSC [19].

The MBTI is usually used in a company context and at times also in other areas where the psychometric analysis of personality traits, someone's abilities or the team constellations plays an important role. There is no specific MBTI for sports but we believe that people who play a certain sports might be more prone to be certain of the 16 MBTI types than another one. In reverse, this might help coaches to tailor training programs more individually and gives them a starting point of analysis and outline of possible solution in case a certain training method does not seem to work for some players. Becoming a better coach and creating a better team starts with awareness of whom they are coaching and the MBTI might contribute to that. In addition, having the information the MBTI provides you with at hand might help for recruiting of professional athletes as well as a better understanding between the teammates.

As reported from Table-2 out of the sixteen types of personality preference ESTJ (112/354) followed by ESFJ (51/354) and ESTP (36/354) were represented. If we look in more detail at the type preferences we will find that ES were having most dominant preference. Ghaderi & Ghasemi, (2012) reported that team athletes are more extroverted (E) than individually athlete, and then individual athletes are more introverted (I) than team athlete. for the next dichotomies, athletes are more used sensing (S) than intuition (N), but athletes that have high subjectivity has tendency more intuition (N) to absorb information [20, 21].

The athlete can make decisions by two ways; by thinking and feeling. The research on semi-professional soccer player reported that soccer athletes are most used thinking for they make decision on playing soccer [22], but they need to used feeling when they shooting the ball to making goal.

The last dichotomies were the approach of outward action with judging or perceiving. The MBTI provides two final distinctions about how individuals approach life: structured or flexible by Myers & McCaulley on [23]. Judgers approach life in a structured way, preferring matters to be settled, while perceivers like to keep decisions "open." Perceivers gain a sense of control by keeping their options open and making choices only when they are necessary. Aside from MBTI's extroversion and thinking constructs, little is definitive about how the other personality indicators may influence sport behavior.

Previous research has used dimensions of the big five personality model, as well as the MBTI, to identify personality differences among athletes and non-athletes [24, 25], but a growing body of research indicates that this information may also be useful in predicting sport choice as well. It's suggested that people with certain personalities are likely to choose sports that require behaviors matching their personalities. For example, LeUnes & Nation, (1982) [26] linked thinking and feeling preferences with sport participation choices. Personality and cognitive style as predictor variables with each uniquely contributing to two facets of virtual team preference, namely preference for virtual teams over working alone and preference for virtual teams over traditional groups [27]. Thus, it's plausible to assume that individuals scoring high as thinkers would be more likely to engage in contact (direct) sports. It's also been hypothesized that extroverts will seek "direct" sports where aggression is permitted instead of sports where it is not [28]. This theory stems from an extroverted athlete's desire to seek greater levels of arousal more so than their introverted counterparts [29].

However, inconsistencies have occurred when attempting to analyze comparisons of "team-sport" athletes to "individual-sport" athletes. Allen, Greenlees, & Jones, (2013) revealed that athletes participating in team sports were more extraverted and open to new experiences, but less emotionally stable and conscientious than those competing in individual sports [30]. From an anecdotal standpoint, it would be reasonable to posit that individual athletes would be more introverted than team participants due to the private nature of their sport [30]. However, Aidman & Schofield (2004) and Morgan & Costill (1996) suggesting that athletes competing in different contexts may render heterogeneous findings [1, 31]. Moreover, fewer differences in personality scores have been identified between athletes competing in various individual sports. Due to the conflicting findings of prior studies, this study sought to establish more reliable estimates of personality and sport choice.

IV. CONCLUSION

An individual's interest to engage in an activity may be regulated by their level of satisfaction with the pursuit. Kandler et al., (2012) and Mann, Briley, Tucker-Drob, & Paige Harden

(2015) indicated that the development of normal personality may inform understanding of the genetic underpinnings of callous and unemotional behavior this internal regulation is reinforced by personal interests initiated by genetic influences [32, 33]. But as Bergman (2012) indicated, "The internal motivators determined by your genetics still require development by practicing". From the results, it can concluded that the higher percentage of personality on students in Magelang were ESTJ (Extrovert; Sensing; Thinking; and Judgment) and the lowest were INTP (Introvert; Intuition; Thinking; and Perceiving) and INFJ (Introvert; Intuition; Feeling; and Judgment.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

The Positive and Negative News Coverage Released by the Media that Influenced Athletes' Psychology

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***Abstract*—The development and the performance of athletes need to be disclosed to the society in general, through mass media though uncontrolled news may give negative side effect which is contra productive for the sports coaching, including mental defectiveness of an athlete. This study is to examine The positive and negative news coverage released by media that psychologically influenced athletes'. The participants were athletes who are from Central java, a total of 10 athletes, who are informed in mass media. They are in potential ages with national level achievement. They are experienced in their own expertise of sport within more of 7 years. They are in progress doing training in the training center basecamp and live in dormitory. The data were collected from interview. The analysis of data by qualitative. Mass media has an important role for an athlete as a constructive criticism shall be accepted as reality. Criticism on the media are helpful in improving her weakness. Athletes actually feel delighted when media covers them. The news in media can boost athletes motivation and popularity. Positive news covered in mass media makes them feel proud. News covering the weaknesses of athletes can bring about self-reflection and self-improvement.**

Keywords—sports news, the positive news coverage, the negative news coverage, mental toughness.

I. INTRODUCTION

In development and improvement of sports achievement, one of the main domains that could not be underestimated is psychological aspect. Here, sports achievement, besides determined by physical, technical and tactical aspects, is also influenced by psychological aspect. Therefore, psychological preparation is urgently required to ensure the optimal physical performance [1]. The role of psychological aspect in an achievement is regarded as important for those who are involved in elite sports.

In a competition, a success is at least determined by 90-95% mental [2]. This fact, an immense factor on mental aspect is unavoidable. In a competition event among elite athletes, the winner is the one who has robust mental toughness.

The performance in sports is influenced by not only positive but also negative expectation towards a particular matter. A positive expectation will definitely give positive impact towards the performance, and vice versa on negative expectation [3]. Further, the degree of positive and negative expectations of a person is influenced by self-belief that she/he will finish the required task well [4].

In some particular situations, though athletes has practiced well and showed significant improvement from their practice, the reality in a real competition might be different as they could not perform the best. Further, the effectiveness of their favorable movement during the practice seems to disappear in a competition. Besides that, the speed of their movement is drastically decreased whereas they become unbelievably rigid. That athlete might have problems in psychological aspect. Therefore they tend to be slightly doubtful in making a decision, face difficulty in determining the right momentum to address an attack, lose concentration when defending and do not have any courage to change their strategy due to anxiousness.

II. MATERIALS AND MEHODS

In a competition event, psychological, physical aspects as well as skills contribute to best achievement. When the ability of an athlete is similar to the ability of the enemy, the aspect that determines the winning is mental thoughnees. Therefore, an athlete who has good mental toughness will be likely more successful in winning a competition.

Many failures of an athlete in a competition are presumably caused mainly by mental aspect. Hence, physical ability and skill trained to an athlete for years would be in vain if they do not have a robust mental toughness.

Psychological condition of athletes in the form of strong mental toughness during a competition becomes one of the essential elements in determining their success. Competitions under high psychological pressure will obviously disrupt the concentration of athletes.

The formation of strong mental toughness on athletes is basically influenced by two factors, internal and external factors. An internal factor relates to the internal condition of athletes including personality structure whereas an external factor is the environmental condition of athletes, including family, rehearsal or society environment.

Meanwhile external factor that influences athletes is an environmental condition surrounding them, including facility, rehearsal or society circumstances. One of the parts of society circumstances is the press or broadcast through mass media related to athletes' achievement or personal problems not to mention sports activity.

Sports news with its variety is viewed as if "a piece of a coin" by the sports coaches and athletes. Therefore, the development and the performance of athletes need to be disclosed to the society in general, through mass media though sometimes uncontrolled news may give negative side effect which is contra productive for the sports coaching, including mental defectiveness of an athlete. This study is to examine the Positive and Negative News Coverage Released by the Media that Influenced Athletes' Psychology.

The research design used qualitative approach [5]. The research subjects were 10 athletes from Central Java, who are informed in mass media. They are in potential ages with national level achievement. They are experienced in their own expertise of sport within more of 7 years. The athletes are from roller skates, judo, tae kwondo, boxing, wushu and volley ball.

The data were collected from interview, each athlete was interviewed 3 times for 30 minutes. The guideline of interview is based on the need of the data in accordance with main objectives to investigate how the athletes' responses toward the news in mass media are. The interview was conducted personally, which was to be likely elicited comprehensive and prolonged information. The interview process was conducted freely and semi-structured alleviate boredom.

The analysis of data uses qualitative data analysis which was administered interactively and continuously until it was finished [6]. The procedure of data analysis were: data reduction, data display, and conclusion drawing verification. The data are verified through expert cross checking, they are: the coach, sport committee, journalist, communication expert, psychology expert.

III. RESULTS AND DISCUSSION

Amir Mahmud the chief editor of Suara Merdeka newspaper and sports commentator, says that normatively according to Act No 40 year 1999 about mass media stating that the reality from that construction implies actually on how media can participate, media content can give as if writing down on a piece of blank space. Media can fill in anything oriented on related matters there. The problem is on how media discuss issues which are more ethical, showing badness-goodness, caring or not caring, feeling of responsibility disclosing the reality and interdependence. The independence shall not be interpreted as a matter based on a volume of balance, but on how media express accentuation of an issue towards motivation for greater good.

In the framework of journalism, a sport is an exploration object. On how and what should be reported by the media are mostly featuring the commercial aspects. There is occasionally a more noble purpose that shall be highlighted which is, supervision aspect. Nevertheless an integral part in that pattern is how to integrate ideal industry which is supervision in balance based on each portion.

In general, the media coverage of sports news is well-known with its pattern of pre-match report, during the match and post-match report. From those three aspects media constantly inserts colorful elements. The first element is how to report news full of conflictainment, a conflict that can trigger people to follow it as an entertainment. How media presents profiles, conflicts prior to a match are reviewed in order to direct the readers or audiences to observe a match from a number of aspects that even sometimes do not surprisingly relate to the sports. Political, sociological, psychological aspects are presented in such a way. Then the second is a report during the match in which atmosphere built by the reviewers are packaged attractively because after a match, there must be interesting topics being discussed.

The meaningful report is related to the process of coaching. Media coverage always gives a side effect especially psychological aspect that media unavoidably has robust influence. The influence on the one hand can trigger intern factor or a factor motivating an athlete, on the other it can discourage the athlete's spirit.

Perceptions must be constructed on how to take advantage of the blank space on the media by willingness though there is sometimes hidden agenda behind its coverage. For example, in broadcasting news journalists usually have significant role in determining the output of the news on whether athletes will be terrorized to influence their performance or instead they will be appraised for the encouragement during a competition. Because it becomes the choice of journalists, they will have particular strategy to report news. Media usually encourages athletes before a competition in order to be superior than the rivals. Chris john, for example, was reported negatively because of the influence of his psychological condition that relates to the market and industry of media. The key is on how media has the willingness to report news, negatively or positively.

According to a communication expert Turnomo Raharja, there is always an inextricable relation between media and sport. Sport becomes one of the commodities of media as it can become commodity of the marketable issue. Athlete with all of their fame, achievement and personal life can become the commodity by the media. Related to the media coverage, the conceptual frameworks media shall have three parameters. First, what has been reported by media must be based on facts. Further, the facts should be able to be verified, tested and should avoid criticism without any evidence. The estuary of all coverage is truthful that any news covered by the media should be based on facts. Actually the media coverage is a result of construction as the media has its own interest. When reporting an athlete with high achievement, there must be an interest behind it whether related to political, economical interest or others. That means the media cannot be value-free, cannot be in a blank space, independent, objective, without any prejudice, and having hidden interest. Many examples show the alignments of media towards particular group. The

next question that shall be addressed is whether or not media coverage especially media criticism can influence the achievement of athletes. As a matter of fact, causalistic thinking should not be used; if athletes are criticized, their achievement will be declined; on the other hand there is a possibility that media criticism can encourage athletes to achieve more. Media only becomes a small part of athletes' achievement and the improvement or decline of an achievement is not merely due to media coverage. We cannot use positivistic thinking or causalistic thinking anymore. Essentially it depends on how the athlete processes information. The critics in media can be a tool for encouraging achievement or instead discouraging the spirit of the athlete.

Further, Ade Usman a journalist of Wawasan newspaper explains that media cannot be value-free. In other words, there is always an agenda and impossible to not favor on one interest. Basically that interest is caused by the effect of situation and condition that later on determine the percentage of influence; whether minority or minority depends on its own situation. A journalist must be in favor of one interest, what makes the difference is the degree.

From a psychological aspect, according the expert Ferdinat Hindarto the Vice Rector III of Unika Soegiyapranata Semarang explains, emphasizing what has been stated by Turnomo Raharjo, that the relation between media coverage and psychological aspect is not a causalistic relation, there is an intervening variable. Take for example boxing, during the preparation of PraPON Mataram when media reported the same pictures for two days consecutively in which coincidentally the athlete in that picture was less likeable by his friends. Consequently, the other athletes are angry and dislike the journalist who covered the picture. Another example is from football when a player is harshly criticized on the media due to his unwanted manner. Because the athlete is a foreign player who cannot speak Indonesian fluently, he proudly shows the news whereas in fact he was being criticized. It indicates that the influence of media coverage gives diverse and complex effects.

According to Yudo coach, Amin Pambudi states that mass media is immensely contributive in the development of sport since positive coverage from the various media in the form of reinforcement will give positive impact for the athletes; on the other hand criticism will offend the athletes. On that condition, athletes tend to be nervous during the practice. The role of mass media in sports development is very essential particularly during a competition. When athletes are exposed, their spirit will be higher afterwards the positive feeling will encourage them to achieve the expected goal. It happens because the exposure from media is actually the will of the society thus the athletes shall perform the best.

Suhardjono, a coach of roller skate states that media can build the excitement of an athlete for achievement, critics on the media are reasonable. Therefore, athletes who excel shall be covered in a media for a promotion thus it will inflict their pride.

From the perspective of an athlete, Roller skates athletes expresses that very often mass media improvises by their own interpretation in making the news. Occasionally, mass media looks for information without asking the athletes but other people. The information is not accurate. Hence, it bothers the athletes because their privacy is opened to public.

A judo athlete expresses that journalists do not understand his choice. The media describes him as an arrogant and rude athlete but from that moment he has better self-control to minimize the critics in the future. Mass media has an important role for an athlete as a constructive criticism shall be accepted as reality. In fact, not all critics addressed by mass media discouraged athletes; instead they encouraged athletes to control themselves better.

Meanwhile Taekwondo athlete, also expresses that the media coverage will not disturb her because she just wants to show the best and makes people proud of her achievement. Therefore, in her opinion media coverage will not influence her performance during a competition.

A wushu athlete, does not have any problem with media coverage because their real intention is to compete and she fully directs her attention on what will happen on the game, not outside of it. Further, her focus is on her rival and herself because it can help bring the best of her on the game. Related to the response of an athlete when reporting on newspaper, wushu athlete further reveals the first feeling appeared after the media coverage is excitement because it shows the attention of media. According to her experience during a competition on Pra PON and won, if there were no critics from the mass media she would have the winning point. On the other hand, if the mass media criticized her decreased speed, she would remember that and put her best effort to improve her performance. In fact the critics on the media are helpful in improving her weakness.

In the current development of sport, the remarkable role of press or mass media has been brought even closer. Indeed, media seemingly becomes an inextricable part of the development which shall be managed well in order to positively impact on the sport achievement. Whenever athletes are exposed on a media, their spirit will be higher as their happiness is linked to the level of expectation on personal achievement. It is just as likely to happen because athletes perceive that the media coverage is a part of society interest which shoul be fulfilled. It is immensely important, therefore, to cover high achiever athletes for the sake of public promotion and the increase of their pride simultaneously.

In responding the negative coverage, athletes' interpretation genuinely depends on themselves. The truth is that not all media criticisms are demotivating them but critics sometimes encourage the athletes to have better self-control thus positive influence will come along. Accordingly, criticism on media perhaps becomes a motivation for athletes to improve their performances.

Athletes who have robust goal setting during certain competition will not be hampered by media as they focus on showing the best and make others or the nation become proud of their impressive achievement. Here, their interest is only on the game not on the matter beyond the competition.

Correspondingly, they are focusing on their rivals and themselves expecting to finish the game as well as possible.

From the perspective of psychology, it should be closely examined that the interconnected relation between media coverage with psychological aspect is not causalistic relation because there exist intervening variables. The first influencing psychological aspect is personal goal setting when athletes totally dedicate themselves on sports. In this case, if the determination is strong, other variables will follow and not easily influence by the inevitable external tensions.

The next aspect related to the media coverage is self confidence. Somehow athletes need to build their confidence by not only internal but also external factors. Motivation becomes the third aspect in which not only positive but also positive news perhaps become the source of motivation. When the critic influences atheltes' performance, it is the responsibility of a coach to respond towards it. Here, the critical media is permissible as long as it is proportional in the appropriate area.

The fourth aspect is intelligence in which the athletes' ability to manage information will be, of course, determined by their intelligence. When reading a media coverage, athelets can be excessively flattered because they cannot appropriately manage the information due to misperception.

Further, personality influences the psychology of athletes. In addition, its dimensions are numerous including on how an athlete should be trained to have attribution. Attribution is interpreted as a mindset to examine the cause of a failure or success.

The sixth aspect is focus and flow on how athletes can turn away anything which is unlikely related to the competition. Therefore, they can truly focus on the competition and put their best effort on the game including ignorance in responding both positive and positive media coverage.

Lastly, stress management and burn out become the seventh influencing psychological aspect of athletes. Attending regional or national training programmes in a few days, weeks or a month maybe can still make atheletes delightfully enjoy the activity. However, after months of doing the repeated activity over and over again will eventually make them feel bored. In this case, media can take on the role of this aspect which sometimes unthinkable. Media is like a knife which can be utilized as a useful cooking utensil or a harmful weapon for killing. The most crucial thing is on how athletes use or manage the information from the media.

Amidst the influence of media, there is an intervening variable which is personality variable. It relates to the theory that every individual naturally possess the need for exhibition to show up and perform. The excessive urge will negatively impact the athletes thus the news should be proportionally managed.

Indeed, media does not constantly become the single variable in influencing atheletes through negative coverage since their ability to manage the information will likewise affect them. The referred levels can be classified into three: intelligence, achievement and types of personality.

IV. CONCLUSIONS

Athletes actually feel delighted when media covers them. The news in media can boost their motivation and popularity. At this level, positive news covered in mass media makes them feel proud. In contrast, news covering the weaknesses of athletes can bring about self-reflection and self-improvement. It is clear that the negative news sometimes possibly become motivation for athletes compared to the impact of positive news.

The interpretation of negative news on the mass media depends on the athletes. In particular, the level of athletes really determines the management of incoming information. The referred level can be divided into three: intelligence, achievement and types of personality. From the perspective of athletes' achievement, elite athletes certainly have robust, independent and solid personality as well as above average intelligence.

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Exploring Spirituality of Sport for Research in Indonesian Context

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***Abstract*—Sport is a multidimensional phenomenon, encompasses various purposes ranging from health-focused physical activities to spiritual-enhancing practices. Spirituality contributes to a person's well-being, and recent studies begin to examine the potentials to integrate spirituality into the practice of consulting in sport context. Spirituality for some extent is related to religion. In Indonesia where religion is the most important aspect of life, studies in how spirituality contributes to sport performance and athletes' well-being are interesting and beneficial. However, only few studies are found in this topic, and opportunity to do research in this area is still widely open for exploration. As researches need strong theoretical foundation, this article aims to provide information based on literature review about spirituality of sport, its theories and applications. This information is meant to help future researchers and practitioners who intend to promote athletes' performance and well-being by the means of the benefits of spirituality and religion.**

Keywords—sport, spirituality, literature review

I. INTRODUCTION

Religiosity and spirituality (S/R) are a highly investigated topic, denoting how important it is for individuals and society. Eight in ten people in the world are found identifying themselves with religious groups or about 84% of total world population [1]. Despite of tendency of increased secularity and more people are refusing religion or getting less religious around the world, people still search for spirituality. For example is Americans, 27% adults think of themselves as spiritual but not religious [2]. Different situation is found in Indonesia, a country with a huge number of religious people, spirituality is expressed within the framework of religion. A survey shows that majority of Indonesian stated that religion has a very important role in society and participate in some rituals [3].

Many studies report how spirituality impacts various aspects of life. Some correlates of spirituality in health outcomes are longer healthy life of older people [4], reduction of mortality rate [5], and mental and physical health [6] [7]. It is known to have effect lowering the rate of heart disease, stroke, kidney failure, and cancer mortality. It lowers cholesterol levels and surgery-related stress, as well as increases positive health habits and longevity [7]. Spirituality also plays important role in coping behavior in facing distressing experience, lowers depression rate, suicide, anxiety, psychotic disorders, and substance abuse [6]. Overall, spirituality has a great contribution to well-being and happiness [8].

In social life, spirituality become predictors of pro-social behaviors, such as volunteering, charitable giving, and helping others, which are contributive for developing moral community [9]. In workplace, this appears in the form of Organizational Citizenship Behavior, indicated by behaviors such as acceptance, assuming additional responsibilities, following the rules and procedures, maintaining and developing positive attitude, and patience and tolerance of dissatisfaction and problem [10]. Due to its practical aspect, spirituality is integrated in health care [11], educational institution [12], in workplace [13], and even sport [14].

Talking about sport, kinds of physical activities comes to mind. Sport is regarded as physical exercise, instrument for health, competition, and championship. Frequently appeared as something physical, sport is more likely less known for having a spiritual facet. Actually, the spirit of sport lies behind every action of athletes and sportsman characterized by working hard, perseverance, and integrity. It is about virtues, values, beliefs, and confidence to something higher than self which influence how athletes and sportsman behave. Spirituality of sport is relatively understudied especially in Indonesia. Therefore, the article is purposed to provide information based on literature review about spirituality of sport, its theories and applications. This review is meant to help sport scientist and practitioner to develop research or application using the concept.

II. DEFINING SPIRITUALITY

Spirituality comes from Latin *spiritus* meaning breath, wind, and life principle. The spirit is the thing within human which is vital and serves as the source of force of life. It is a dynamic reality that expresses itself in the body and organizes body as team. The spirit works in holistic way, meaning integrating cognitive, affective, and physical elements. Therefore, there is no dichotomy between body and soul. The spirit is beyond the self, but it serves as the force that enables and motivates a human being to search for meaning and purpose of life, to search the supernatural or meaning that transcends him, to discover his origin and identity, and to require morality and equity [15].

As related to spirit, spirituality is about the practice and outworking of the spirit and the ways in which it is developed, with its different aspects and relationships connected, sustained and understood. Spirituality is relation and action-centered [15]. In more general definition, Merriam-Webster Dictionary defines, spirituality as the quality or state of being spiritual or sensitivity or attachment to religious values [16]. Due to its close relation to religion, spirituality is often defined as exclusively attached to religion, at least from formal religions' stand point. Spirituality is the practice of worship, devotion, and prayer which enables an awareness of God. Hence, to enhance spirituality, a believer needs a guide (e.g. religious teacher) to help him develop faith and undergo rituals [15].

Spirituality is "a search for the sacred" [17]. The term *search* indicates that spirituality involves a process and effort to discover the sacred and conserve it. To discover and conserve the sacred, one has to take a so called spiritual pathway. It includes various social involvements that come from traditional religious institution or non-traditional spiritual group (newer spiritual movement). That pathway might consist of religious practice and ritual or other activities aimed to discover the sacred through for example: music, art, yoga, social action, and also sport [17].

However, in a greater sense, spirituality is broader than what is confined by religion. Spirituality relates to acts of reflection and self-development. It is especially stressed by New Age perspective which defines spirituality as a person's attitudes in understanding life through self-reflection which in turn facilitates self-growth and transformation [18].

Spirituality seems liberated from the confine of religious dogma and getting secularized by the new conceptualization. However, it is still relevant for religious people that practicing religion should result in self-growth and transformation. Religion is much meaningful when it involves development of spirituality. Operationally defined, spirituality should consist of three aspects: 1) awareness and appreciation of the other (including the self, the other person, the group, the environment and, where applicable, deity), 2) the capacity to respond to the other by putting spirituality into practice while interacting with others, and 3) developing significant life meaning based upon all aspects of awareness and appreciation of and response to the other [15].

III. SPIRITUALITY IN SPORT CONTEXT

Spirituality is more than ideas and aspirations regarding life meaning. It is life experience rooted in beliefs and values. In sport context, spirituality goes beyond individual athletes. It reaches organization and management of sport institution and wider community of sport stakeholders [19].

Generally, spirituality has three focuses. First, it is the search of life meaning, both doctrinal and existential. Spirituality relates to human's need to understand the nature of life and his living environment. However, spirituality is not only about concepts of life, but also one's awareness about himself and awareness about other. It results in acceptance and appreciation to others, willingness to contribute to community and sense of purpose while living with others [19].

Second, spirituality is about religious beliefs and practices. In various religions, historically and theologically, physical exercise and sport are part of religious practice [19]. Cashmore [20] explained that religion and sport is related to each other. For example, the tradition of Olympic game was born in Greek about centuries ago as part of religious festival. Sport contest was aimed to achieve physical excellence, and to please Gods [20] [21] [22].

Third, spirituality is means to promote psychological well-being and happiness. Applied spirituality is a new field of study in positive psychology which tries to give contribution in improving individuals and community's well-being. It studies virtues and its manifestation in modern life as long practiced in spiritual traditions from various cultures [19] [23].

In practice, spirituality can be found in various aspects of life. For example, in work place, a worker can be regarded as highly spiritual person due to his tendency to relate his work to life meaning. Work becomes his means to find life meaning. In education, one purpose of learning is spiritual development. In Indonesia, we can see it in Republic Indonesia Law No. 20 Year 2003 on National Education System. Essentially, the purpose of education is to develop the spiritual, moral, cultural, mental and physical development of pupils. In healthcare, spirituality is highly promoted as it has great impact on therapeutic outcomes. Spirituality can serve as buffer against the severity of illness.

The practice of spirituality in sport context is no difference, but with some uniqueness. Unlike in education and healthcare where the development of spirituality becomes conscious concern of the institutions involved, in sport, spirituality is something that is naturally developed through the course of training, exercising, and competition. There are no agents in sport with special duty to guide athletes or sportsman' spirituality, but the development of spirituality is an embedded process in the sport itself.

Since a long time, sport also has been utilized as tool for personal development. The practice of sport is known to enable transformation, liberation, and character development [15]. Spiritual development can be seen as natural part and result of sport. For example, holism of sport always stresses the balance of spirit, mind, and body. The best performance comes from the ability to unite the three faculties. Thus, sporting is more than merely physical working, but activity that touches one's state of mind and emotion, connects him to a meaning of life, and promotes self-growth. That is how sport acts as the center of meaning and purpose, contributing to spiritual development. With sport, a person can experience a holistic experience when body and mind work together to achieve one meaningful purpose, namely excellence [15].

A. Spirituality and Issues in Morality and Ethics

Relationship between sport and religion is one central topic under the discussion of spirituality of sport. The topic of religion and spirituality in sport context is relevant because

those two things are often regarded as the source of ethic and morality which are essential in sport.

Competitive nature of sport for some extent is detrimental. Ambition to win at all cost may trigger the willingness to mistreat other (by violence or aggression) or cause hate to opponent for they are the obstacle of ambition. A competition may turn to be like a war where the game is motivated by the desire to beat and destroy the enemy rather than a moral quest for fair play and respect to humanity. Athletes and sportsman may engage in non-ethical behaviors, such as consuming performance-enhancing drugs, deceiving officials, breaking the rules, cheating, committing injustice, and intimidating other players.

The doctrine of "win at all cost" constitutes the spirit of modern sport when sport is separated from religion and spirituality. Modern sport is characterized by secularism. Despite of the tendency to become ritualized and arouse strong emotion, sport is no longer related to the sacred. Sport players tend to be obsessed to surpass previous record and to become phenomenal or to create history [24]. Sport becomes industry which focuses mainly to gain material profit, popularity, and fame. In this environment, ethic and morality are sometimes sacrificed for worldly gains.

From spirituality of sport perspective, this phenomenon can be seen as the symptom of spiritual crisis. Human-being is prone to insecurity and he always try to overcome this problem by a will to power. In sport context, the will to power is achieved primarily by winning. The desire to win may drive people involved in sport, such as athletes, coaches, spectators, and officials, to do anything for the sake of pride, power, or money. When sport is mainly purposed for worldly interest, people would eventually loss many virtues, such as patience, compassion, self-control, humility, and respect [24].

This reality of sport is contradictory to the original spirit of sport which is manifested in the concept of sportsmanship. Sportsmanship refers to the concern and respect for the rules and officials, the opponent, one's full commitment toward sport participation, and social conventions as well as relative absence of negative approach toward one's participation in sport [25]. Sportsmanship which results in fair play actually is rooted in spirituality. Sportsmanship is the manifestation of good spirituality among stakeholders of sport.

The problem regarding morality and ethics implies that religion and spirituality dimension of sport cannot be ignored. Sport originally is integration of the function of mind, body, and spirit so that separating sport from the sacred or spirituality would create imbalance. An athlete is not perfect if he does not have a clear mind and good heart (spirituality), even though he is physically strong and highly skilled. For this reason, cultivating spirituality should be promoted as part of sport education and training whether or not it is associated with religion in practice.

B. Spiritual Experience as Motivation of Sport Participation

Spirituality influences how athletes and sportsman behave during exercising or engaging in sport. Otherwise, sport and various kinds of physical activities also influence one's spirituality. As known, sport is not only about competition. People participate in sport for various reasons ranging from health, recreation, socialization, to spiritual experience. In other way, sport can be tool for enhancing spirituality.

Sullivan [26] explained that sport and physical activity can evoke the sense of spirituality in a person. Some people participate in outdoor sports (e.g. mountain climbing, rock climbing) to see beautiful natural sceneries, to get in touch with nature and wildness, and finally, to interact with God. In this case, sport becomes a media to seek spiritual experience and to deepen faith. Basically, sport provides some kind environment which enables its participants to sense the existence of God and to experience the sacred. People enjoy sport because it facilitates their spiritual development.

Some studies affirm this finding, for example in surfing which is secular in nature [27]. Spirituality is highlighted not from the kind of sport a person participating in, but the meaning that person attached to the activity. In surfing, environment becomes a key element to experience the sacred. Here, the ocean creates for many surfers a realm of opportunity for transcendental experiences and ultimately enlightenment. When surfing, the surfers feel emotion such as "awe, respect, gratitude and love for the ocean. … In the surfing realm of belief, the ocean can mean something sacred, revered, feared, respected, appreciated or loved. Surfers also reported a sense of humility and personal empowerment developing out of their oceanic experiences, the former from surrendering to, and the latter from surviving and harnessing, the waves." (p. 32)

C. Spirituality and Practical Issues in Sport Performance and Consulting

Applied spirituality in sport context is another important topic regarding how the role of spirituality to solve practical issues. Spiritual well-being is known to be associated with most aspect of good physical and mental health. Athletes who are high in spiritual well-being tend to display better athletic coping skill related to sport performance. Thus, to improve performance, spiritual well-being should be the concern [28].

Watson and Nesti [29] suggested that spirituality should be considered in research and practice of psychological consultation. For some athletes, religious beliefs and spirituality are regarded very influential for their performance and life skill. Spirituality can be integrated in mental skill training for athletes and counseling process.

In other studies, some researchers investigated the use of prayer on athletes. Athletes pray for three main reasons: to overcome uncertainty and anxiety caused by competitive situation, to put life and sport into perspective, and to give meaning to their participation in competition [30]. Also, it is recommended for athletes to improve their praying to cope with anxiety or sadness. Praying is a constructive way to help athletes overcoming their sport-related problems, to help them be more reflective and receptive to learning from mistakes or disappointment [30].

Spirituality also plays role in counseling to help athletes facing failure and defeat. Athletes' lives are not only built by strength, tenacity, and hard work, but also ability to sustain personal coherence and resilience in the face of lived experience, both involving success and mastery or failure and defeat. Spirituality is needed to help athletes gaining meaning from their life experience, its achievement and the setbacks and to help them expand their comfort zone [31].

IV. CONCLUSION: RECOMMENDATION FOR FUTURE RESEARCH

Sport inherently is a holistic activity which is not only influenced by spirituality, but also influences the development of spirituality on people. It is widely recognized that body and soul cannot be separated; there should be no dichotomy between physicality and spirituality. Especially in the context of competitive sport, an athlete's excellence is defined not only by physical strength and skill, but also his mental toughness and integrity which are considered a function of high spirituality. For that reason, integrating spirituality into sport activity is important.

Effort to integrate spirituality to sport which is considered secular activity in modern era is increasing. Various studies has reported positive role of spirituality on developing athletes' morality and ethical behavior, motivating people to participate in sport, and supporting sport practitioners in solving athletes' performance and career problems.

In Indonesia, research under the topic of sport, religion, and spirituality is very limited. In a country whose people are religious and devoted to religions, research in this area should be promoted. Many issues can be addressed for future research, for example: the role of spirituality and religiousness on Indonesian athletes, spirituality and religiousness as part of coping skill, integration of spirituality and religion into sport education and training, and integration of spirituality and religion in sport counseling and consultation.

Collaboration between scientists and practitioners in sport and experts on religious studies should also be supported. This collaboration can be a media for knowledge sharing through research and practice. This effort is almost never done in the past due to a mindset that sport science has no connection with religion and spirituality due to the secular nature of sport science. Connecting sport to religion in Indonesia can be very much relevant since many athletes, coaches, and other stakeholders in sport are people with religion and treating spirituality as important part of their life.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

The Phenomena and Impact of Public Participation on Sport at Big City (Surabaya And Semarang) Car Free Day Area

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Abstract—This research is conducted in big city Car Free Day area, especially Semarang and Surabaya to find out public participation and the impact of sport performed at car free day area. This research is qualitative research by using observation and interview methods. The technique of analyzing data is using data reduction process, data presentation, and drawing conclusion. The sample consisted of community or specific group which is preforming sport in Car Free Day. The descriptive result of this research divided into 5 types, those are kind of performed sport, group or individual performing, sport duration in Car Free Day, routine intensity to the public impact.

Keywords— car free day, sport, impact and phenomena.

I. INTRODUCTION

In this research problem statement discuss the Phenomena and Public Participation Impact in Sport at Big City (Surabaya and Semarang) Car Free Day Area. The problem interested to conduct because of, 1. Car free day aims to refine air quality caused of pollution by sport activity, 2. In the beginning up to the final, communities or group, individual or personal conduct several activities together in the car free day area set. This case interested to conduct because of public; such as parents, children, teenager, even certain community like bike, artistic and food community gathered to contribute in Car Free Day activity. In this problem statement, the researcher takes individual or society group which are performing sport activities. The value and case which are observed in this research as follows: 1. Kind of sport performed, 2. Group, community, or personal performed sport active, 3. Society which are active performing sport in Car Free Day, 4. Duration in sport performing, 5. The intensity of following sport activity in Car Free Day area.

Correlating to the case, by performing sport in Car Free Day area affected to valuable impact for public, in order to raise healthy lifestyle culture in modern era, especially developing public participation in car free day present and the future.

II. MATERIALS AND METHODS

This research is qualitative research that used decriptive approach. In descriptive qualitative research, the collected data are words, sentences, or pictures that have stronger meaning than numbers and frequencies. The researcher emphasize a notes to describe the real condition to support the data. [7]. The research focused on exploring and studying the phenomenon of sport activities which is done by a person or group or community in a big city like Surabaya and Semarang.

Research Design

This type of research used in this reasearch is correlational design which purpose is to connect two or more variables (Maksum, 2012: 105), in relationships among these variables including reciprocal relationships.

The Data and sources of data

The data in this qualitative research are words and actions, the rest are addition like document and questionnaire. The sources of data used in this research are people, groups, or communities who do sport in the area of Car Free Day.

Sample collection technique

In this research used purposive sample is a technique that used a sample that has been known first.

1. A person or group who do sport in the area of car free day.
2. They do the sport between o5.30 – 09.00, from open until close of CFD.

The amounted sample taken are 77 people with details, 38 people in the Semarang city and 39 people in Surabaya city. Sample taken in this research are, as follow as:

1. A person who join gymnastics or aerobics gymnastics
2. A person or community who are cycling in the area of CFD
3. People who do sports activicties such as, football, basketball or running in the area of CFD.

This sample are selected based on the criteria and with the following procedure:

1. Person or group who has been finish the exercise without interrupting their activities.
2. The researcher offers, whether the person or group is willing to be interviewed or fill the questionnaire.
3. After they agree to be interviewed, the researcher recorded based on the questione that has been prepared.
4. Even they do not want to be interviewed, they are willing to fill the questionnaire that has been prepared**.**

The sources of data

The data in this qualitative research are words and actions, the rest are addition like document and questionnaire. The sources of data used in this research is primary data which obtained by the researcher directly from the original sources. Such as, people, groups or certain communities who do sport in the area of Car Free Day.

III. RESULT AND DISCUSSION

The result from the whole data description are distributed to the subject of research. The questionnaires given directly to the respondents by waiting for the filling questionnaire and collecting the questionnaire that has been filled directly, can be seen in the table below:

From the data above, it can be seen that questionnaire returned are 100%, while the questionnaire is not returned is 0%. From the questionnaire that has been processed in this study are 100%

TABLE 1 (THE AMOUNT OF QUESTIONNAIRE THAT HAS BEEN DISTRIBUTE TO RESPONDEN)

Information	**Frequency**	**Presentase**
Questionnaire distributed	77	100%
Questionnaire who returned	77	100%
Questionnaire who fell	0	0%
Questionnaire that can be used	77	100%

TABLE 2. THE RESULT OF DESCRIPTIVE STATISTIC FROM RESPONDEN ANSWER.

Variabel	N	The range of sports performed	Long on CFD	Mean Exercise done	Mean Long on CFD	Std. Deviation
Type sports	77	5-10	9-22	15	14,62	3,035
Group or individual	77	6-20	15-17	18	20,51	3,227
Long sports	77	7-20	21-20	21	28,51	3,247
Intensity	77	6-20	13-20	18	23,79	3,118
impact	77	4-20	8-18	12	17,36	2,145

The following discussion of the result from descriptive research as follows as:

1. In the question number 1, 6, 11, 16 are focus on the type of exercise which is done, the average people who come to the CFD by coming in groups to follow some of the existing sports in the CFD by bringing equipment from home such as bicycles, basketball , skipping etc,
2. For questions 2, 7, 12, 17 are focusing questions on groups or personal society who go to CFDs are more often grouped with friends and join other people who have similar hobbies or sports like, aerobic gymnastics, jogging together or cycling together.
3. In Questions 3, 8, 13, 18, are about the length of exercise in CFDs. CFD Visitors spend more than 1 hour and on average they leave home at more than at 06.00 a.m and arrive home at 09.00 a.m more, so the average time they spent in the area of CFD are more than 2 hours
4. About the intensity or routine in question 4, 9, 14, 19 are the people in big cities often visit CFDs for workouts, the average they come to CFD are more than 2 times in a month, and the average people spent less than 3 hours in CFD until go home
5. While in question 5, 10, 15 and 20 about the impact of experienced by CFD visitors are feel happy when they take part in sports in the area of CFD. They also feel entertained and get a new spirit and motivation after doing sports in the area of CFD

IV. CONCLUSION

1. The existence of CFD programs conducted by the government give a positive impact, especially for the people who come, it is proven as much as 72% of respondents feel the new spirit and motivation coming from sports in the CFD area.
2. This CFD activity is at least done in all areas in big cities in Indonesia. This is because, besides join the CFD, people also can do sports and recreation alone or with friends or

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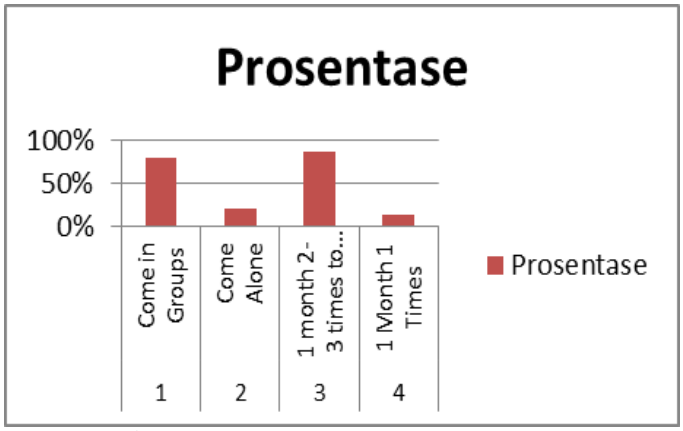

Fig 1. Charts of the results research

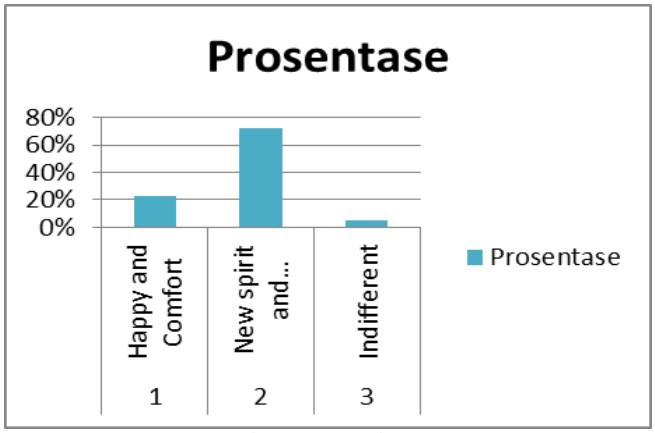

Fig 2. Percentage of visitors CFD feel

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Qualitative Study of Exclusive Breastfeeding Success among Working Mother

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***Abstract*—Infant Mortality Rate in Indonesia was 32 deaths per 1000 live births, whereas Under-five Mortality Rate reaches 40 deaths from 1000 live births. One of the factors which underlie those numbers was the low rate of exclusive breastfeeding. In Central Java, exclusive breastfeeding was still below target (80%), one of the main problem was working mother. This study aims to describe exclusive breastfeeding success in working mothers. This research used qualitative descriptive method by using phenomenology approach which yields descriptive data about the problems. The main subjects were mothers whom succeeded in exclusive breastfeeding (6 months) which data taken using in-depth interview. Respondents were selected using snowball sampling method, then confirmed using source triangulation method. Data analysis was done by transcription, reduction, coding, data presentation, and then drawing conclusion or verification. The results showed that the family and co-workers support also pre-natal preparation were common factors found in working mothers who succeeded in exclusive breastfeeding. The existence of support from the hospital and early breastfeeding initiation was also done by most of them.**

Keywords— exclusive breastfeeding, working mother, qualitative research

I. INTRODUCTION

High infant mortality rates were a huge problem in Indonesia. In 2012, Indonesia Demographic and Health Survey (SDKI) showed the infant mortality rates in Indonesia was 32 per 1000 live births, or only 6% lower from the 2007 data [1]. Those data showed that Indonesia was struggling to reduce its child mortality rate. It means that Indonesia may not be able to fulfill its 2030 Sustainable Development Goals (SDGs) target to reduce child mortality rate into 12 per 1000 live births (32% from 2012 data).

One effort to reduce child mortality rate is exclusive breastfeeding. Exclusive breastfeeding was to only feed breast milk to infants for the first 6 months of life. They must not be given any other kind of food and beverage, except for vitamins, minerals, or drugs prescribed by health professionals. There were several benefits related to exclusive breastfeeding such as, reducing infection risk (e.g. diarrhea, urinary tract infection/ UTI), ear infection, and lower respiratory tract infection), and reducing chronic illness risks (e.g. diabetes, sudden infant death syndrome, diabetes, and obesity). Breastmilk contains immunoglobulin which prevent babies from infections. Mother with HIV/ AIDS could prevent its transmission to their babies by exclusive breastfeeding[2]. These findings suggest that giving exclusive breastfeeing had huge benefits to the infants even after they have grown.

Several policies had been made by Indonesian government to support exclusive breastfeeding. Minister of Health already made several policies in this issue, such as: *Keputusan Menteri Kesehatan RI No. 450/Menkes/SK/IV/2004, UU No. 36/ 2009, and PP No. 33/ 2012,* which specify exclusive breastfeeding as baby which exclusively fed breast milk from 0 – 6 months and suggested to continue until 2 years with proper complementary feeding [3]. Despite of those rules, the breastfeeding coverage in Indonesia was still lower than target (< 80%). In central Java, the exclusive breastfeeding coverage also had been stagnant, 53% (2013), 61% (2014), 62% (2015), and 54% (2016) [1].

Research done on a textile company in Jakarta concluded three factors supporting breastfeeding practice among working mothers, there are knowledge on storing breast milk and breastfeeding practice in workplace, availability of breastfeeding facility, endorsement from health care workers, and support of company supervisor [4]. Exclusive breastfeeding practice among working mothers must be improved using various interventions because of its benefits to the babies, mothers, and companies. A few of the working mothers had done exclusive breastfeeding practice, so it was important for us to do research aiming to describe the story behind success of the working mothers in doing exclusive breastfeeding. There were eleven research question we use to describe this phenomenon.

II. MATERIALS AND METHODS

A. Research Focus

The general objective of this research was to describe the exclusive breastfeeding success on working mothers. The specific objectives of this research were to answers all research questions described on the paragraph above. Focus of this research is to describe all factors related to working mothers' success in practicing exclusive breastfeeding. This research covered several areas, including preparation before birth, on

maternal leave, right before work, after came back to work, breast milk management, support from families, co-workers, superiors, and health workers, also challenges and solutions on exclusive breastfeeding periods (0 – 6 months old).

B. Research Design

This study was qualitative descriptive type which produces data to describe problems. Qualitative research could develop concepts that help deeper understanding of social phenomena and behavior in a natural setting. This qualitative research used phenomenology approach, a study that seeks the "essence" or meaning of a phenomenon experienced by the participants [5]. Using phenomenology approach, this study was expected to produce data which describe exclusive breastfeeding success on working mothers which will be presented in the narration.

C. Source of Information

This qualitative research was using purposive and snowball sampling method. In purposive sampling researcher choose participants rather than be randomized. Participants chosen according to several criteria which enabled researcher to only select the important ones as key informants. After chosen, they will be asked to suggest other possible participants for this research. This method was known as snowball sampling.

Snowball sampling was chosen because data about working mother which successfully practicing exclusive breastfeeding was limited. This limitation made us combine purposive sampling for choosing key informant, and snowball sampling to cover data saturation. By nature, qualitative study could not determine exact minimum samples. Addition of new participants could be stopped once the data is saturated or repeat itself.

This study got help from Indonesian Breastfeeding Mothers' Association (*Asosiasi Ibu Menyusui Indonesia*/ AIMI) to choose key informant. The criteria for key informants are: (1) Working mother who successfully practice exclusive breastfed its baby for 6 months. (2) The child must be born in the last 2 years. (3) Minimum working hours was 5 hours per day. (4) Participant was agreed to be interviewed. (5) Participant is communicative.

D. Research Instrument and Data Collection Technique

The data collection technique in this qualitative research was in-depth interview, an interview technique trying to dig deeper into participant's experience. The instrument used in this study was a set of interview guidelines to get information about the experience of working mothers who successfully provide exclusive breastfeeding to their babies, which include: (1) What are things prepared and performed by the working mother during pregnancy, maternity leave, before return to work and after came back to work, for her baby successful exclusive breastfeeding? (2) How was the mechanism of pumping and saving pumped milk during working hour for exclusive breastfeeding success? (3) How was the breastfeeding management for exclusive breastfeeding success? (4) How was the support from family, work environment (superiors or co-workers), and health worker to working mother for exclusive breastfeeding success? (5) What are the challenges faced by working mother during the exclusive breastfeeding period and their solutions for exclusive breastfeeding success?

The materials used to support data collection in addition to interview record book where researchers written the interview process were tablet to record sound and take picture so that all data or information gathered could be recorded properly and completely.

E. Data Validity Check

In order to avoid or eliminate subjectivity, the data validity was cross checked using triangulation. Triangulation was a method used by researchers to check back the validity of data obtained from the results of in-depth interview with research participants. There are several types of triangulation, and this study was using source triangulation, which means collecting data and checking data validity through different sources of information (participants).

Triangulation of sources or informants were done by doing in-depth interview whose impacting mothers in their successful exclusive breastfeeding, which includes the family (husband or parent or in-laws or other), the work environment (superiors or co-workers), health workers (doctors or midwives). The criteria of informants as cross check or triangulation were, (1) Informant is in the research area. (2) Willing to be interviewed. (3) Easy to communicate with.

F. Data Analysis Technique

In qualitative data analysis, the presentation was based on data or information from in-depth interviews which collected from many resources, analyzed, then concluded. The researcher sought to highlight important statements from the sample to provide basic understanding of the phenomenon under study. The data analyzed was in accordance with the research problem which will be described in the report as description or narration. Data analysis on this qualitative research using interactive model, which includes the following sequences: (1) Data collection: data were collected from in-depth interviews written in field notes and written "as it is" in transcript. (2) Data reduction: data collected in the form of field notes was combined into one transcript form, and then the useless data was discarded; given a coding or category made by researchers which had a particular meaning in accordance with the research questions (as shown in table 1). (3) Data presentation: decrypting data in a narrative. The participants were kept confidential by obscuring any identities. (4) Conclusion/ verification: data were discussed and compared with theories or results from the previous research. Conclusion was taken using induction method, which was drawing conclusion from specific to general things, then reported descriptively.

TABLE 1 QUALITATIVE DATA REPORT

Indicators	Quotes	
	English	**Bahasa**
Preparation during Pregnancy	"I often read articles about breastfeeding and the kind of food for nursing mothers. I have an elder sister who works and give exclusive breastfeeding, and then I ask for advice from her, for the other things, I see from Instagram." (Participant 4)	*"Baca-baca artikel tentang menyusui dan makanan untuk ibu menyusui. Sebelum ada searching-searching ada kakak aku dia juga ibu bekerja dan ASI Eksklusif terus minta saran dari dia, lainnya ya lihat-lihat di instagram gitu." (Participant 4)*
Preparation during Maternity Leave	"On my maternity leave, I directly breastfeed my baby and after the fifth day of delivery, I started to pump and stock pumped milk. the pumped milk stock was only when I have to go back to work." (Participant 4)	*"Pas cuti langsung menyusui dari payudara sama pas masuk lima hari baru aku mulai pumping buat stok. Pas aku cuti full, bayi menyusu langsung sama aku, cuma itu buat jaga-jaga, persiapan ASI buat adek." (Participant 4)*
Preparation before the End of Maternity Leave	Yes, obviously I educated my family about preparation of giving pumped milk to infant and then how to handle my baby, because when the work schedule started, for the first time trained, my child did not want to drink milk unless directly through me (my breasts); I need to teach how (to give pumped milk)." (Participant 4)	*"Ya itu, yang jelas memberikan edukasi ke keluarga, persiapan memberikan ASI ke adik itu gimana, terus cara menangani adik gimana, karena kan waktu mau masuk kerja, saat pertama kali dilatih adik nggak mau minum susu kecuali langsung lewat aku (payudaraku), jadinya perlu ngajarin itunya (memberikan ASI perah.)." (Participant 4)*
Activities on Working Days	"I pump after 2 hours working before lunch time and 2 hours after lunch time. When I am staying in my office, I will pump there. But when I have meeting in other places, I will bring my pumping stuff, so wherever it is, I can still pump my breast milk" (Participant 1)	*"Saya pumping setelah 2 jam masuk kerja sebelum makan siang, lalu saya pompa lagi 2 jam setelah makan siang. Kalau pas saya dikantor ya merahnya dikantor, tetapi jika ada pertemuan diluar saya membawa alat pumping untuk antisipasi. Dimana saja tempatnya jika ada tempat yang oke saya melakukan pumping." (Participant 1)*
Breast Milk Pumping and Storing Mechanism	"No, sometimes if my breast feels hard, I will massage first, if not, just straight pumping." (Participant 4) "There are two bottles which I put directly to the breast, after set, I put the timer on the phone and pressing the pump. Not manual, I use an electric pumping." (Participant 4)	*"Ndak, kadang si terkadang kalau keras banget aku pijet dulu kalau ndak ya langsung aja si." (Participant 4)* *"Ya kan botolnya kan dua langsung aku tempelin aja, udah nempel baru aku setting timer nya di hape terus baru aku pencet alat pumpingnya. Nggak manual, pakainya elektrik." (Participant 4)*
Pumped Milk Management	"It was given every 2 hours, but if the baby cries before 2 hours then pumped milk was given." (Participant 2)	*"Diberikan 2 jam sekali, tapi kalau bayi menangis sebelum 2 jam, ASI (perah) tetep dikasih." (Participant 2)*
Family Supports	"At first, they did not support me, but I persuaded them and told them about babies' health and will be helped by my first son to take care of his little brother. Mother and in-laws were supporting me, at last" (Participant 1)	*"Awalnya tidak mendukung, tetapi saya merayu dan memberikan informasi terkait kesehatan bayi dan dibantu anak pertama untuk merawat adiknya. Ibu dan mertua mendukung pada akhirnya." (Participant 1)*
Working Environments	"When I did breast pumping, he (the superior) did not give me too much work and allowed me to bring my baby in the office if needed at a time." (Participant 3)	*"Ketika saya memompa ASI, beliau tidak memberikan beban kerja yang terlalu banyak kepada saya dan mengizinkan saya untuk membawa bayi saya ke kantor jika memang diperlukan sewaktu-waktu." (Participant 3)*
Roles of Health Workers	"Got formula milk from doctor, because I ride different car, at home my child almost drank formula milk." (Participant 5) "There was nurse with lactation specialization, nurse on baby room pumps breast milk manually. And gave breast milk directly to the baby (Participant 3)	*"Dapat susu formula dari dokter, karena saya beda mobil, hampir waktu di rumah anak saya diberi susu formula." (Participant 5)* *"Ada perawat yang khusus laktasi, perawat di ruang bayi memompa ASI walaupun manual. Dan memberikan ASI langsung ke bayi."(Participant 3).*
Challenge and Solutions for EBS	"The solution was that if the job outside the office I will wait until back the office and directly pump., just try to pursue the schedule. "(Participant 4)	*"Solusinya kalau pas kerja di luarya udah tak biarin sampai kantor langsung pumping ... gitu jadi dikejar aja si." (Participant 4)*

III. Results and Discussion

A. Participant Descriptions

The participants of this study were working mothers who successfully practiced exclusive breastfeeding. The snowball sampling was stopped when the data was saturated. In this study, the data was saturated on the fifth participants so the triangulation also five peoples ranging from families to co-workers. The youngest participant aged 24 years old and the oldest was 33 years old. All participants had a high degree of formal education (undergraduate degrees and above), most participants had one child; only 1 participant had 2 children. Of the five participants of the study, there was a spontaneous natural birth and the others had a cesarean section. On the day of interviews, the babies age ranging from 7 months old to 13 months old, all of them were girls, with normal baby weight (more than 2,500 grams). All participants work either as lecturers or as employees. The results of in-depth interviews on working mothers describe things related to exclusive breastfeeding success.

B. Preparation during Pregnancy

At the time of pregnancy, participants prepared themselves by reading most articles from the internet (Instagram), which were about exclusive breastfeeding and correct breastfeeding method, food choices for nursing mothers, and benefits of exclusive breastfeeding. In addition, there was a participant whom participated in seminars on breastfeeding preparation. Other participants got knowledge about exclusive breastfeeding from college. Then, there are also participants who claim to gain knowledge about the exclusive breastfeeding from health workers and from the mother and child health book (KIA Book) she owned since pregnancy. There were also participants whom follow the community of mothers who succeeded in exclusive breastfeeding, especially working mothers, to gain experience; including preparing husbands as "ayah ASI" (to support wives in giving exclusive breastfeeding). One of the participants gained an experience from her elder sister who was a working mother and succeeded to give exclusive breastfeeding.

Mothers should discuss several issues with superiors or co-workers about her decision to breastfeed and work, to make sure whether went home to breastfeed or to breastfeed at work, to confirm time off at working hours were used to breast milking, to ascertain whether in the workplace was a place for breast pumping and pumped milk storage, to find out whether there was a daycare in the workplace or around the work environment and all facilities provided. All participants did preparation started on pregnancy for the success of exclusive breastfeeding.

Some important steps in the success of exclusive breastfeeding for working mothers were also undertaken by research participants, such as to study about breastfeeding and breastfeeding management, to get support from all families, friends and other relatives, to choose a maternity place supporting exclusive breastfeeding, to choose health workers who support exclusive breastfeeding, to look for breastfeeding experts such as Lactation Clinic and Lactation Consultant, to prepare for future difficulties, and to create a positive attitude about pumped milk, breast milk, and breastfeeding.

C. Preparation during Maternity Leave

During maternity leave most participants were breastfeeding their baby directly. There was one participant breastfeeding her baby indirectly using pacifier for a month after she gave a birth. This participant said on the very first time of her baby birth, she could not breastfeed directly because of her psychology problems and the tongue-tie of the baby. After those times she could breastfeed her baby directly.

Maternity leave was an important period for the participants to store their pumped milk and keep them frozen. There was a participant whom already starts to pump her breast milk and store it since her fifth day after delivery. Other participants, they started to pump their breast milk on the third month after delivery which means a month before their maternal leave ends so they should go back to work. A participant said that she pumped her milk while her baby was sleeping, therefore she can keep it for their baby and give it on workday. The pumped milk is carefully kept in the freezer or refrigerator and labeled by the date of the pumped milk stored.

All of the participants were happy and grateful that they can breastfeed their baby during maternal leave. The mothers' diet during their maternal leaves should be consisting a lot of water, vegetables, fruits, and various kind of food, without any prohibition or taboo. Before their maternal leave ends, mothers were preparing a nanny or their parents as caretakers for their baby and storing pumped milk. They also gave them knowledge about exclusive breastfeeding and skill about giving pumped milk.

D. Preparation before The End of Maternity Leave

Before the end of the leaves, mother could prepare for exclusive breastfeeding success by giving information for parents and caregivers about how to give pumped milk to their baby. Participant also trains the baby to be fed with pumped milk, so that the baby was accustomed with it.

One participant said that the important thing was to prepare pumped milk in the refrigerator. Moreover, the participant also prepared pumping equipment, sterile tools, bottles for milk, and also apron for preparation of breast pumping in the office.

E. Activities on Working Days

There were few things done by working mothers to successfully exclusive breastfed when they came back to work such as consuming lot of fruits and vegetables, proteins, staple foods, and drink a lot of water.

In the morning before mothers began to work, all of them were breastfeeding their baby. On working hour, there was a participant who chose to pump or breastfeed at home. All participants already had an appropriate management to manage the workload, so it did not cause stress which could affect breast milk production. Another participant had a very good boss, so the participant did not feel overwhelmed on the daily work. Some participants always tried to finish their job exquisitely in the office.

Relating the sleeping pattern, most participants feel that their rest time was enough 7-8 hours per day. However, there were two participants who feel that their rest time were not enough, because at night they often woke up when the baby awakens. Mothers need to consume highly nutritious foods and drinking enough fluid, to be able to breastfeed the baby in the morning before going to the workplace, and immediately after work, breast pump every 3 hours while working, preparing milk supply in the refrigerator while working, breast milking in a comfortable room while looking at baby photos or viewing baby video recordings, trying to manage the job well so that the mother was not stressed, and had enough rest [6].

F. Breast Milk Pumping and Storing Mechanism

There was one participant, which was pumping at home because the distance between home and the office was close. She chose to go home for a moment just to pump and then return to the office for work. While the other participants pump in the workplace, with varied mechanisms. Some participants were breast pumping using manual pumping equipment and the others used electric pumps. Equipment brought by mothers from home to the workplace for breast milking were pumps, glass bottles, ice gels, pump chargers, labels, aprons, tissues, and cooler bags.

Breast pumping procedures were performed by participants using some common steps. First was washing their hands until clean. All participants washed their hands before breast pumping; coincidentally the hand washing facility was available at the workplace. There was a participant that said she usually did breast massage before breast pumping and there was another participant who never massage her breast before breast pumping. On the other hand, most participants answered that sometimes they massage their breast before breast pumping. Massage was only done if the breast felt hard or swollen.

Most participants did not use the breast milking courier service to brought breast milk from the office to home. Breast milk brought by mother and stored after returning home. But there was also participant who says that she had used online transport services to deliver her breast milk back home, but that was only occasionally or when needed.

The time required to breast pumping was varied, ranging from 20 minutes to 1 hour. The amounts of breast milk obtained in each breast pumping period at the office were from 45 ml to 300 ml.

G. Pumped Milk Management

When the mother worked in the office, person who gave the pumped milk at home were a nanny or grandmother or the relatives. During mothers working time in the office, babies were given pumped milk for every 2 hours. If the baby was crying or fussy before 2 hours then the pumped milk still be given. So, the breast milk was given to the baby as needed.

All participants did monitoring at the office, by calling or sending a short message via Whats App to the grandmother or caretaker at home. Usually the participant asked if the milk had been given to the baby, and how many bottles of milk given to the baby. Breast milk was given to the baby during mother working time with an average 500 cc per day.

H. Family Supports

All participants said that their husband, parents, and in-laws are supporting their decision to practice exclusively breastfeeding. A participant said that at first her parents and in-laws were disagreed with her decision, but after explaining to them, they understood and agree to help her success. Another participant said that her mother came to her home to support exclusive breastfeeding. As for husband, all of them are supporting and wish the best for their wives and children.

Family was the closest people which mothers could rely on. Information gave by family had emotions so it will have greater impact to the mother [7]. So, family supports and involvements will be guaranteed a successful exclusive breastfeeding.

I. Working Environments

Working environment was important in making sure a successful exclusive breastfeeding. Work environment consists of policies, facilities, superiors, and co-workers which must be supportive. All participants said that their workplace supports breastfeeding although some did not have complete facilities to breast pump.

The supportive environment made the entire working mothers feeling little to no pressure in pumping their breast milk. Both superiors and co-workers were endorsing exclusive breastfeeding practice. Some were even reduced the workload of the mothers, and for other at least they did not harass the breastfeeding mother.

The breastfeeding-friendly environment was integral part of breastfeeding promotion which could increase coverage of exclusive breastfeeding practice [8]. In the US, there were several projects which tried to promote breast-feeding friendly environment such as: breastfeeding-friendly child care centers, breastfeeding-friendly child care award, etc.

Most of the companies are supporting breastfeeding because of new state law in Indonesia. UU no 13/ 2003 explained lactating room must be silent, clean, had enough room (minimal 3 x 4 sqm), had good circulation, and had a sink. Equipment needed were manual/ electric breast pump, bottles to store breast milk, refrigerator (ice bag), bottle sterilization tool, and cooler bag [4]. Other than working environment, we found that communities also played role in successful exclusive breastfeeding. Most of the participants were joining AIMI. Two participants did not join AIMI, one had access to its counselor. The participant who did not join community were using internet to search information about exclusive breastfeeding. In AIMI they share and disseminate information about exclusive breastfeeding, and also had discussion group about issues relating to breastfeeding practice. Right information was crucial, so positive surroundings (from families or communities) were important in keeping enthusiasm to breastfed [9].

J. Roles of Health Workers

Health workers were important in making sure the exclusive breastfeeding was done properly. It was known that some health workers promote infants formula to their patients [3]. Their promotion largely succeeds because bearing and birthing child was deeply affect mother. Mothers wanted the best for their infants, so they generally accept suggestions which gave positive impact to their children [5]. One participant had met with health worker (doctor) who did not support exclusive breastfeeding by gave formula milk to the family.

Health workers were impacting exclusive breastfeeding success. Most participants reported that their doctors/ midwifes/ nurses are supporting exclusive breastfeeding. Support from health workers did not stop on the delivery days but continued to the ward care. One participant reported that she had been visited by her doctor for antenatal care evaluation. Those support improved patient understanding about exclusive breast feeding and also boost their confident.

There was no integrated information system about breastfeeding. Integrated system which done by NICU nurses were effective to educate mother about exclusive breastfeeding and debunk any false feeding beliefs [10]. This made breastfeeding information only partially given to the mothers.

K. Challenges and Solutions in Exclusive Breastfeeding Success

There were several challenges for working mother to breastfed on office hours. The prominent problems were the availability of lactating room and support from co-workers. This problem described by participant 2.

Other problems were irregular teaching schedule and administrative jobs given to her. She was not only obliged to teach, but also preparing documents for accreditation. This will become problem, because baby usually breastfed when hungry so it will unpredictable.

One of the solutions was by training baby to breastfed regularly or called scheduled breastfeeding method. This method may not be proven in clinical trials yet, but some studies already shown a good trend over baby-led breastfeeding [11]. The problem with scheduled breast pumping was that there are several times it did not went according to work schedule.

IV. CONCLUSION

The results showed that family and co-workers support were commonly found in successful exclusive breastfeeding. Pre-natal preparation, knowledge about breastfeeding management, and understanding about breast milk pumping also founded in some successful working mothers. The existence of support from the hospital and early breastfeeding initiation also looked importance in some mothers. Only one participant reported the success of exclusive breastfeeding also attributed from the older children support.

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Community Empowerment Model Based on Local Wisdom as An Effort to Reduce Maternal Mortality Rate in Jeneponto Regency

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***Abstract*—The study was aimed to find a model of community empowerment based on local wisdom as an effort to reduce Maternal Mortality Rate (MMR). The research method was dominant-less dominant design. The result showed that the behavior of pregnant women in the effort to decrease the risk of MMR was a high risk. Community beliefs related to the health aspects of the mother were still strongly. Community participation was still lacking. Community Empowerment Model Based On Local Wisdom was triangle model PASALAMA.**

Keywords— Community Empowerment, Local Wisdom, Maternal Mortality

I. INTRODUCTION

The maternal mortality component is closely related to the process of pregnancy, birth, postpartum. These three periods will determine the quality of human resources to come. Maternal mortality is an important component of demography to be examined because it plays an important role in the survival of a community group, whether it will develop, static or fail to survive.

Results of Indonesia Demographic and Health Survey (IDHS) in 2012 showed the maternal mortality rate reached 359 per 100 thousand births [1]. The number of maternal deaths in South Sulawesi in 2013 was 108 per 100,000 live births, and in 2014 it increased to 138 per 100,000 live births [2]. Trend The Maternal Mortality Rate in Jeneponto Regency also increased sharply from the year 2013 as many as 5 people (82 per 100,000 KH) to 13 deaths in 2014, 2015 with 11 deaths, and 8 deaths in 2016 [3].

A considerable increase in MMR is beyond expectations, quite a lot of interventions are being implemented by the Indonesian government. But has not produced maximum results, this is because Government policy is always oriented to the aspects of service, medical and only touch the aspects of social and economic determinants. In addition, due to the seriousness of the government has not been optimized. Government policy is always the policy of the program is top-down, partial, non-participatory and shortcuts. There has been no community-based intervention, conducted optimally and earnestly and directly touches the cultural aspects of society. So it is expected to reduce the MMR (Maternal Mortality Rate). It needs to work harder to decrease the MMR beyond the current trend. It can no longer be a business as usual effort. Innovative efforts that have high leverage should be put forward in health development that is through the empowerment of society based on local wisdom by considering background characteristic, culture and ability of the society.

II. MATERIALS AND METHOD

The research method was dominant-less dominant design. In this study, the approach used as the main approach was quantified with survey descriptive to 189 pregnant women's by total population, while the qualitative approach was used as an alternative approach. The qualitative data on community participation in reducing maternal mortality was measured using interview guides, Focus Group Discussion guides and observation sheets.

This research will be carried out in the following stages:

1. Problems Identification. Conduct active meetings with community leaders, village heads, village leadership teams, health committees and other important people conducted in the community of intervening sites to discuss problem identification, prioritize problems and jointly to address maternal mortality issues.
2. Community Diagnosis. Conduct surveys of pregnant women, in-depth interviews and FGDs to explore information on mother's knowledge, attitude, practice/intentions. As well as digging information about community participation in preventing maternal death.
3. Analysis of Community Diagnostic Results. Have a meeting with the community to analyze the information they collected during the community diagnosis. Together with the community to find solutions/programs to overcome the problem, especially the prevention of maternal mortality.
4. Develop an alternative model of community empowerment based on local wisdom in an effort to reduce maternal mortality.

III. RESULTS AND DISCUSSION

The process of identifying the problems in phase I obtained information about the condition of he location of the research that was a problem in an effort to reduce the risk of maternal death. Qualitative data obtained can explain and reinforce the findings of quantitative data. The problems identified are:

1. Low knowledge of pregnant women about efforts to reduce the risk of maternal death (85.7%). Low knowledge was due to low education and lack of access to information. This is reinforced by the findings of qualitative data.
2. Negative community's belief in the concept of pregnancy care, childbirth and postpartum is still strong, among others: Still strong value charismatic central figure sanro or shaman in helping the process of pregnancy care, childbirth, and postnatal care. The belief in abstinence food, including foods of animal and vegetable classes is still strong.
3. Community customs relating to pregnancy, childbirth and postnatal had not been touched as a medium to increase knowledge of mothers, husbands and families about efforts to reduce the risk of maternal deaths.

Based on the results of data analysis, obtained information about knowledge, attitude, practice, maternal nutritional status as follows:

TABLE I. Knowledge, Attitude, Practice and Maternal Nutritional Status

	Bontomate'ne	
Variabel	N=189	%
Knowledge		
Enough	27	14.3
Less	162	85.7
Attitude		
Positive	134	70.9
Negative	55	29.1
Practice		
Good	25	3.2
Not Good	164	86.8
Maternal Nutritional Status		
Normal	93	49.2
KEK	96	50.8

Phase II of community diagnosis used a qualitative approach,. This section describes community participation in reducing the risk of maternal mortality, priority issues, and finding alternative solutions to address the problem based on socio-cultural background and community capability by FGD method and observation. The community participation in reducing the risk of maternal mortality is still lacking.

Stage III The results of the joint diagnostic analysis of the community resulted in recommendations to address the priority of the problem of low knowledge, attitudes, and practice of based on local wisdom among others agreed that:

1. Problem solving by establishing PASALAMA' Community-Based Program Committee/local wisdom.
2. PASALAMA' Program Committee Based On Local Wisdom need to form PASALAMA' group with local term Pabburitta Kasalewangan Amma' (PASALAMA') IE People who deliver news/information about the mother's health by coming to the house of all relatives and all taiulan as an effort to decrease maternal mortality rate.
3. Training on PASALAMA' groups should be conducted in efforts to reduce maternal mortality by referring to local cultural beliefs that have been identified in stage I and will be expected to assist and promote health for pregnant women.

Stage IV and V resulted in a Local Wisdom-based community empowerment model in an effort to reduce maternal mortality, IE Triangle PASALAMA' model (Pabburitta Kasalewangang Amma') with "Empo Sipitangngari" Approach (Discussion).

The community empowerment model based on local wisdom in this research consists of planning, implementation and evaluation. The researcher puts himself/herself as a facilitator to provide information related to efforts to reduce maternal mortality in the study sites and to discuss for problem solving. While the community as the decision makers of each step of the activity and as a resource on the background of social culture and the ability of the community/local potential associated with the behavior of efforts to reduce maternal mortality. [4, 5, 6, 7, 8, 9, 10, 11, 12], that the growth and development of community participation in development will be pursued through the provision of opportunities based on the understanding that communities have traditional skills and wisdom and through intensive empowerment and sustainability.

The results of community diagnosis through FGD gave birth to an agreement to form a community-based PASALAMA program committee in an effort to reduce maternal mortality, FGD results also agreed that the PASALAMA program committee 'should form a group called local and based on the socio-cultural background of Pabburitta Kasalewangang Amma' (PASALAMA ') with Empo Sipitangngari approach/deliberation/negotiation through security triangle strategy. This local term was born

to one of the FGD participants and agreed by the other participants.

Abbiritta in Makassar's cultural customs is delivering the news by going to the homes of all the relatives and all the friends as a form of appreciation to ask their willingness to attend an event or a party.

PASALAMA' is an abbreviation of Pabburitta Kasalewangang Amma' which comes from the Makassar language, which is a person who conveys information about maternal health in an effort to reduce the risk of maternal death. The process of delivering information to the individual, the family continuously and continuously follow the client's development, as well as the process of assisting the client, to change the client from not knowing was knowing or aware (knowledge or knowledge aspect), from know to be (attitude aspect or attitude) and from being able to perform the behaviors that are introduced (aspects of action or practice). Abbreviation PASALAMA 'in the Makassar language is a person who saves.

Empo Sipitangngari comes from the Makassar language which means Musyawarah. According to Big Indonesian Dictionary of Deliberation means discussion together with the intention to reach a decision on solving a joint problem or consensus. Mufakat means agreed. In the Decree of the Minister of Health (SK Menkes) no. 128/2004 on Puskesmas Basic Policy, it was explained that the meeting was attended by leaders (formal and informal) and community members to formulate the priority of health problem and the prevention effort

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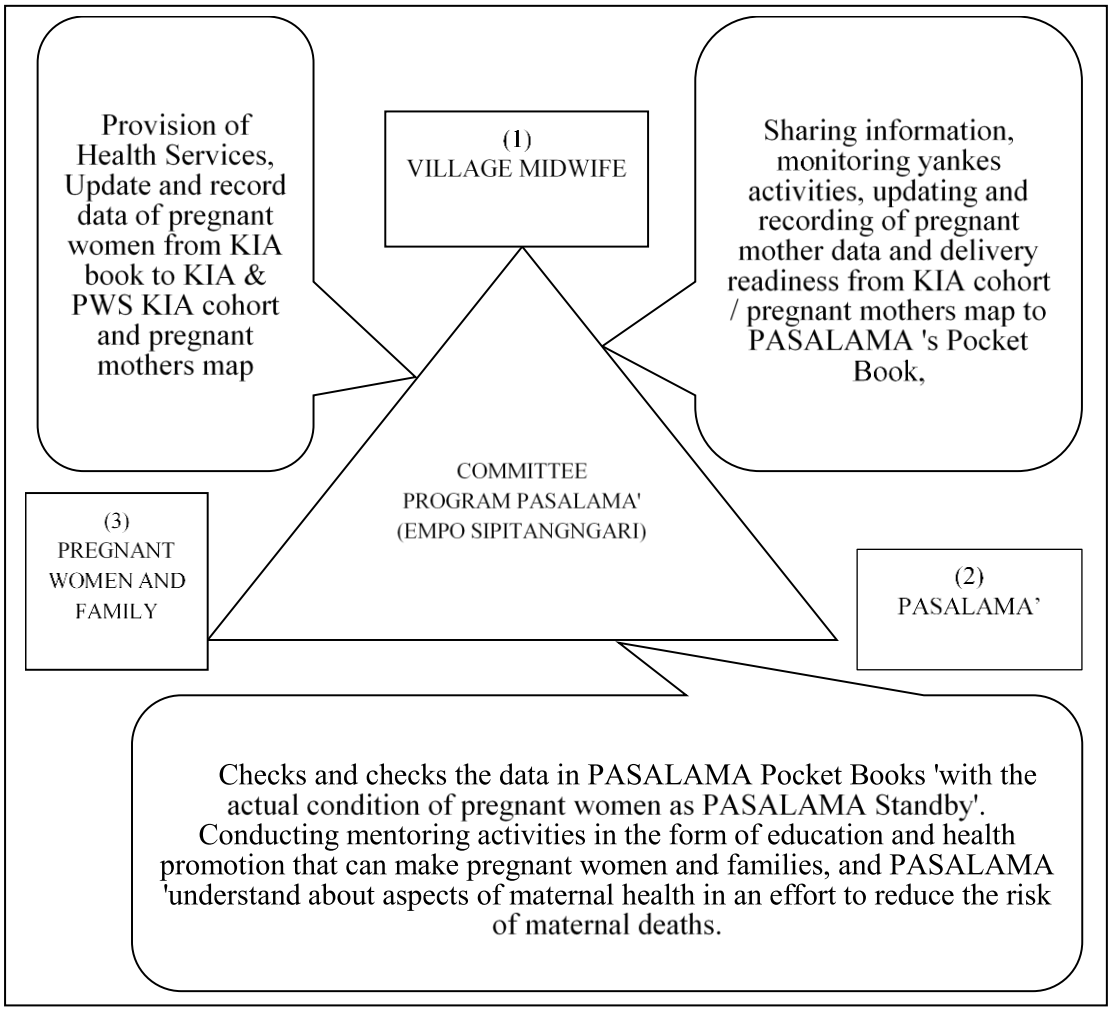

Fig 1. Security Triangle Strategy Through The Program Committee Approach "Empo Sipitangngari"

Program PASALAMA' Empo Sipitangngari approach is an empowerment effort, so that pregnant women and their families become subjects and not the object as happened so far. The Empo Sipitangngari approach uses consensus media to agree on preparedness to ensure maternal security from pregnancy, childbirth, to childbirth. While the interaction of each component in PASALAMA' program committee is a strategy to approach pregnant women to health services to improve their ability to help themselves (self care) in understanding that every pregnancy is risky. Empo Sipitangngari approach through PASALAMA' program refers to the strategy of the Ministry of Health of RI that is Moving and Empowering the Community for Healthy Life.

The security triangle is implemented holistically to ensure the safety of the mother from pregnancy to childbirth, using the empo sipitangngari approach between: 1) midwives in the village, 2) PASALAMA', and 3) pregnant women and their families in the program

committee. It says holistic handling means for maternal health since pregnancy to childbirth is not only the responsibility of midwives in the village, but also pregnant women and their families and PASALAMA' with the approach of shrimp cultivation program committee through the security triangle. Holistic handling refers to the mission of the Ministry of Health RI is Making People Healthy.

Interaction between a pregnant mother and family with a midwife in the village is an activity of giving health service, update and record of pregnant mother data from KIA Book to KIA cohort and Local Area Monitoring KIA (PWS KIA) and map of the pregnant mother. The interaction between PASALAMA' and pregnant women is a check and data activity in Pasa Pocketbook' with the condition of actual pregnant mother as PASALAMA' alert, and conducting mentoring activity in the form of education and health promotion that can make pregnant mother and family, and PASALAMA' understand on aspects of maternal health in an effort to reduce the risk of maternal death. Interaction between village midwife and PASALAMA' that is, information sharing, monitoring of health service activity, update and record of pregnant mother data and readiness of delivery from KIA cohort/pregnant mothers map in PASALAMA' Pocket Book.

In depth interview explains that according to pregnant mothers for childbirth is the responsibility of the pregnant mother and family is not affairs of midwife in the village [13, 14].

The recommendations presented in the preliminary study are the implementation of the PASALAMA program consisting of maps of pregnant women, PASALAMA Pocket Books, Book of Recording and Reporting of PASALAMA and MCH Books [13, 14].

According to Budijanto and Sopacua (2006). the pattern of community empowerment is a strategic effort because it involves pregnant women as subject and not as object. It is explained that the map of pregnant women, Pocket Handbook of PASALAMA, Book of Recording and Reporting of PASALAMA 'and KIA Book interact with each other holistically through coordination to ensure the safety of pregnant women, childbirth until after childbirth. If pregnant women and their families understand the contents of the MCH Book, then this knowledge will have an impact on understanding the importance of delivery assistance of midwives in villages assisted by PASALAMA 'alertness. Coordination at village and hamlet levels is a technical implementation of Empo Sipitangngari Approach, which is translated as a consensus to agree.

The Empo Sipitangngari approach is facilitated by the Minister of Health Decree No.564/Menkes/SK/VIII/2006 on Guidelines for Implementation of Desa Siaga Development [15, 16, 17].

Implementation is through the development of teams in the community as a form of community participation at the village level. Fostering community-level rural participation is a sequence, continuous and interrelated sequence of activities including village community forums, self-assessment (SMD) surveys, the village community meetings (MMD) and cadre training [15, 16, 17] through FMD socialization on alert villages is given to village apparatus, representatives from sub-districts, representatives from Puskesmas, community leaders and others.

The purpose of socialization so that community leaders are able to conduct SMD for their village with the guidance of health workers [15, 16, 17].

The SMD data and findings are lists of health problems, potential data and community expectations, discussed in the MMD to determine the priorities, support and contributions that can be contributed by each individual/institution it represents and the solution steps in the development of Poskesdes and Desa Siaga [15, 16, 17].

Planning of activities and funding required in the implementation of the PASALAMA' Program (the cost of transporting visits to work plots and the cost of organizing as needed in the interactive process) needs to be budgeted through the village fund allocation (ADD) and discussed jointly through the MMD approach.

The allocation of village funds (ADD) is a cash transfer that must be allocated by each district/municipality government to all villages of 10% of total balancing funds (general allocation funds and revenue-sharing funds) received by districts from the central government after deducting basic allocations for civil servant expenditures. This policy is stipulated in Law no. 32/2004 on Regional Government and PP. 72/2005 on Village, followed up by Minister of Home Affairs Letter to governors and regents/mayors throughout Indonesia. 140/640/SJ dated March 22, 2005 concerning Guidelines for Allocation of Village Funds from District/City Government to Village Government [15, 16, 17].

The Role of the Ministry of Health, especially the Directorate of Maternal Health and other relevant directorates as directors is urgently needed, as well as Provincial and District Health Offices. Steering or stewardship, according to WHO is a governmental function that is responsible for the welfare of the population, which relates to the trust and legitimacy of the population towards government activities, especially in the health sector [18]. One of the steering roles is to formulate and establish policies on the direction of health development, especially at the macro level.

Successful implementation of PASALAMA 'Program with Empo Sipitangari approach which is the acceleration strategy of decreasing maternal mortality rate need to be measured by determining indicator for input, process and outcome as a system [19, 20, 21, 22].

The expected impacts are the increase of K1 and K4 in ANC, delivered by health workers and referrals of pregnancy and maternal women on time prevented 3 late and maternal maternal deaths recording, delivery and postpartum were accurate. It all comes from good, organized, and comprehensive results because it involves all those involved in accelerating the reduced risk of maternal death [23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33].

IV. CONCLUSION

A Community empowerment model based on local wisdom in an effort to reduce maternal mortality is model triangle PASALAMA' (Pabburitta Kasalewangang Amma') with Approach "Empo Sipitangngari" (Discussion). Need to apply Local Wisdom-Based Community Empowerment Model in an effort to reduce maternal mortality rate to build maternal health knowledge and experience related to maternal health.

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Analysis of Preventive and Health Promotion Program Using IPO Model in Primary Health Care in Semarang

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***Abstract*—Primary Health Care (PHC) has a strategic role to develop and maintain prevention and health promotion programs. This paper researched was done in PHC in Semarang, by evaluating the indicators in Input-Process-Output (IPO) Model. The supporting factors for health promotions are availability of funds and facilities and infrastructure in PHC. The inhibiting factor is the lack of health promotion knowledge and the management of PHC. Even so, the planning of health promotion program was done by PHC.**

Keywords— PHC, health promotion, IPO Model, public health

I. INTRODUCTION

Public Health Efforts are any activities to maintain and improve health (Promotional Efforts), and prevent and overcome with the emergence of health problems with families, groups, and communities as target. Promotional and prevention efforts are key to achieve the goal of health paradigm, as to improve health status and control of health costs. This effort is a strategic step in improving health status, which leads to health cost control including the current era of JKN (Jaminan Kesehatan Nasional) and sustainability in the next year, so as to achieve Universal Health Coverage (UHC) in 2019 [3].

SKRT and Riskesdas data shows that there has been an epidemiological transition of diseases in Indonesia from infectious diseases to non-communicable diseases that require special treatment for long periods of time and even lifetime, resulting in high health costs. Prevention of non-communicable diseases should be undertaken to control future health costs, so that prevention and health promotion aspects must exist in the process of providing health services as stated in Presidential Decree No.12 of 2013

Primary Health Care (PHC) has a strategic role in prevention and health promotion programs. The obstacles in implementing prevention and health promotion programs are the lack of quality and quantity of human resources, facilities and infrastructure in PHC; patient attitudes and also patient compliance on treatment. The quality of human resources must be improved by the knowledge of extension methods and health education materials. Organizational development strategy is also an essential factor in the implementation of prevention and health promotion programs. Some of those circumstances affect the prevention and health promotion activities to be implemented not optimally in PHC, with that result, further research on the factors that support and inhibit the implementation of prevention and health promotion activities in PHC need to be done [4,5,7].

This study aims to determine the factors supporting and inhibiting the implementation of preventive and health promotion activities in PHC in Semarang.

II. MATERIALS AND METHOD

Study is observational research by cross sectional design, done to all person in charge or doctor in PHC who's willing to be respondent, and served in PHC in cooperation with BPJS (Social Security Administrator of Health). Samples were taken by consecutive sampling technique. The research instrument was questionnaire and interview guide which contains input and process evaluation along with check list of observation to be filled by enumerator. Data collection was done by enumerators who have been trained on how to collect data in this research.

The analysis of this research was using Input-Process-Output (IPO) Models, introduce by Donabedian. The Input had human sources, service delivery costs, policies and guidelines for the implementation of activities and materials/tools for data collection and processing. While The Process was about program planning in some period of time, including targeting, budgeting and responsible activities, program implementation progress and the supervision or assessment of the program, The Output was the program performance.

Good inputs allow good processes, good processes allow good output, and good output will have an impact on good outcomes, so good input becomes the basis for

quality activities, good processes are the basis for quality output, with output quality the basis for the expected impact on the target. One method of evaluating the health service program is by continually observing the program to interpret the information obtained, and formulating the program feedback on the relevance and efficiency of the program so as to provide a better impact for the continuity of the program according to the principle of management.

Hence, this research evaluated the model's component, The Input data was collected by questionnaire, The Process data was collected by PHC Report, and since The Output is the result of the program implementation or management working result and not all PHC made the report, the researcher couldn't analyze The Output phase.

Analysis was done descriptively using frequency for respondent characteristics, meanwhile for input and process components are reported qualitatively.

The data obtained in this research is then in the entry and the coding, then analyzed the descriptive frequency to identify the characteristics of respondents, then determine the factors - factors supporting and inhibitors most experienced by FKTP. Then to determine which factors are most influential, analyzed the relationship by using logistic regression.

III. RESULTS AND DISCUSSION

This study researched on 46 respondents, while 2 respondents didn't give complete answered questionnaire, this study only analyze 44 respondents. The characteristics of 44 respondents were shown by the table.

TABLE 1. RESPONDENT CHARACTERISTICS

Respondent Characteristics	Count (%)
Age	
20 – 29 y.o.	15,9
30 – 39 y.o.	40,9
40 – 49 y.o.	11,4
>50 y.o.	29,5
Gender	
Female	63,6
Male	36,4
Education	
Undergraduate	88,6
Post-Graduate	11,5
Employment status	
Permanent	84,1
Temporary	13,6
Length of Work	
< 1 year	11,4
1 – 3 years	20,5
4 – 6 years	25
7 – 9 years	15,9
10 – 13 years	9,1
>14 years	18,2

Based on the respondent characteristics, most of them are at 30-39 y.o, which means that the respondents were in productive age and most of them were permanent employees. We can say that they already had experience in their job because more than 60% were experienced for more than 3 years. The respondents are graduates of medical, dentistry, medical profession programs and dental profession programs, based on that education background, the respondents must have comprehended the preventive and health promotion activities. While the dentists should comprehend the oral and dental health of the Society, the doctors' competence standard is the patient management of holistic and comprehensive, including conducting health promotion for individual family and society [3].

A. *The Input:*

The respondents were asked about the definition of Health Promotion, it is found that only 13.6% answered correctly. It is fact that most of them didn't really understand the definition of health promotion. According to WHO, health promotion should include strengthening health, ability to control health issues, reducing the health impacts caused by the environment, whether social, political or economic, allocating resources for the prevention of health problems, the spiritual social dimension that affects health, ecological approaches and the introduction of the development of society to develop effective strategies in health promotion programs. Health promotion in the Health Ministry Decree was defined as an effort to improve the ability of the community through learning from, by, for and with community, so that they can help themselves, and develop community-based activities, in accordance with local social culture and supported by public health policy.

Even though we found only small number of respondents understood the definition of health promotion, most of them knew the purpose of health promotion and all respondents knew what health promotion tools were.

All respondents agreed that health promotion needed to be done in PHC; PHC must implement clean and healthy living or PHBS (Perilaku Hidup Bersih dan Sehat; health promotion is strategic program for PHC development; and PHC must create a conducive environment for patients, families, visitors, and communities surrounding, so that they would be willing and able to have clean and healthy living.

Some of the respondents believed that health promotion was responsibilities that belonged to health promoter or health promotion worker, not by them, even though most of them disagreed. This fact showed that most PIC in PHC, doctors and dentists already knew the function of health promotion and realized that everyone must do health promotion, not only by some group of people. They also realized that PHC as strategic health promotion media, must implement PHBS, by program and facility.

Most of the respondents agree that health promotion needs big fund to be done, but not really need to be done in special room in PHC. Most of them also believed that health promotion not really needed promotion instruments.

B. *The Process:*

Using data obtained from PHC, 54.5% respondents stated making the planning before doing preventive and health promotion activities. The Planning included identification of problems and needs of citizens, priority

issues and plan the plan of action to address health problems arising in the community. Only 8 respondents stated that they also used health data and did initial survey to define health problem and citizen needs.

Monitoring conducted by PHC may vary, including achievement of process indicators, outputs, and outcomes. The number of respondents that their working place did monitoring and evaluation of prevention and health promotion programs was 72.7%. The process indicators used by health facilities for monitoring and evaluating the prevention and health promotion activities in this research were the number of attendance and the number of counseling successfully conducted by health facilities, Output indicator was posttest score and / or discussion of question and answer, after giving information to the community. Outcome indicators was the number of visits to the health facility and reports of morbidity. The simpler planning is done only by preparing the material, the person who will deliver the material, and place, as well as determining the schedule and the cost of the implementation of the course.

IV. CONCLUSION

By this research, we found that:

1. Factors that support the implementation of preventive and health promotion activities are: the attitude of medical officers to health promotion in PHC, availability of funds, sara and adequate infrastructure for the implementation of preventive and health promotion activities
2. Factors that impede the implementation of preventive and health promotion activities are: The knowledge of medical officers on preventive and health promotion activities in PHC, which is limited to providing information on clean and healthy lifestyle. So that the components of atmosphere development, advocacy and empowerment has not been done by the first level health facilities.

It can be concluded that the planning of health promotion program in PHC was not done by people that understood the definition of health promotions. Even though they understood the function, the aim of health promotion, it was doubtful that they could define the activities of health promotion. While they believed that health promotion not really need special room and promotion instruments, they still believed that health promotion needed much money or big fund to be done. They also believed that the successful of PHBS implementation was by the reason of conducive environment in PHC, which means infrastructure and facilities of PHC must be assured. Not all PHC made report of the result of the program implementation or management working result.

It is recommended to provide training on health promotion methods for Primary Health Care with materials including resource management and facilities at Primary Health Care for the implementation of preventive and health promotion activities as well as planning, implementation and monitoring and evaluation techniques. And the need for policies that regulate the implementation of prevention and health promotion activities in Primary Health Care. It is necessary to conduct research on implementation of prevention and health promotion activities guidance in Primary Health Care and research on the object of prevention and health promotion activities.

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Development of Health Education Materials for Junior High School Students

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***Abstract*— Teaching materials are very important in teaching and learning in schools. In Junior High School, the teaching materials used are not same with the curriculum, especially teaching materials of health education in physical education subject. The purpose of this research is to produce learning materials health education for junior high school students. This research is research development or R & D (Research and Developments). The research method used was the research of the development of health education materials in Junior high school in Semarang. Research data in the form of sheets of evaluation about the quality of the products and product improvement suggestions from Experts and teachers of physical education. Data analysis technique used is a descriptive analysis of the shape of the percentage. From this research obtained expert evaluation data amounted to 80.7% in health education and physical education teaching Experts of 79.5%, thus gained an average percentage of 80.125% and is included in the category of "good". While in field trials were obtained the following results: 1) physical education Teacher in SMP Negeri 31 Semarang of 88.63%, 2) physical education Teacher in SMP Negeri 36 Semarang of 86.36%, and 3) physical education Teacher in SMP Negeri 37 Semarang of 96.59 %, thus gained an average percentage of 90.41% and included in the category of "very good". The conclusion is the development of health education materials for junior high school students viable for use by learners in the learning of physical education in schools.**

Keywords—development, health education material, student, junior high school introduction

I. INTRODUCTION

Health education is one of the materials taught in physical education subject starting from primary schools to secondary schools [5]. Learning resources basically teaching materials used in teaching and learning process which aims to facilitate the objectives and the learning process [3]. According to Setyosari [6] development in the sense of a common mean of growth, changes slowly (evolution), and changes gradually. Research and development commonly referred to with the development of research-based (research-based development).

According to Borg and Gall in the journal Ristya Astantry [7] research development is a process used to develop and validate product education. Furthermore mentioned that the development research procedure essentially consists of two main objectives, namely: to develop products and test the effectiveness of products to reach the goal.

While according to Gay in textbooks Wasis Dwiyogo [11] research and development is an attempt to develop a product that is an effective form of learning materials, media, learning strategies for use in school, not to test the theory. The resulting products in research and development, among others, training materials for teachers, learning materials for students, learning media to facilitate the learning, the learning system, and others.

Those definitions of the above, it can be concluded that the development in this research is the process of developing and testing the effectiveness of a product in the form of educational materials for use in schools in order to facilitate the process of teaching and learning so that learning goals can be achieved.

Learning materials are information, tools, and text that needed a teacher or instructor for planning and implementation study in learning. According Andi Prastowo [1] and also equipped by Pannen in 2001, materials are materials or subject matter are arranged systematically, which used the teachers and learners in the learning process. From other sources in the website dikmenjur.net retrieved more applicative sense that learning materials or materials teaching is a set of material or substance of learning (teaching material) that are arranged systematically, which shows the figure intact of competence which will be controlled by learners in the learning activities.

From a few opinions regarding understanding the learning materials, Andi Prastowo [1] stating the materials is any material (whether information, tools or text) that are arranged systematically, which shows the figure of the whole of the competencies will learner controlled and used in the learning process with the aim of planning and review of the implementation of learning. For example, modules, textbooks, handouts, or scale models, audio materials, interactive learning materials, and so on.

In the manufacture of materials needed for manufacturing materials, such materials are the lifeblood of learning. Need to realize that the learning resource is very important in putting together a learning materials. Therefore, the existence of a learning resource has at least three main objectives, namely to enrich the information required in compiling learning

materials, can be used by the compiler of the materials, and makes it easy for learners to learn a certain competencies [1].

Have we known together that the materials are not the same as learning resources. For, materials have different types and shapes. However, the experts have made some categories for various materials. Some of the criteria to become a reference in the descriptions make the classification is based on its shape, how it works, and its nature, as outlined in the following explanation aka [1]: 1) Teaching materials according from shape, 2) Teaching materials according to how it works, 3) Learning materials by their nature

Rowntree in Andi Prastowo [1] says that by their very nature, learning materials can be differentiated into four different, as mentioned below.

Health education is a process of dynamic change in behavior, where the change is not simply the process of theory of matter or transfer from one person to another and neither set of procedures, but these changes occur due to consciousness from within the individual, group, or society itself [10]. While according to Rajendra K Erwin [2] health education is the process of helping someone, by acting in singly or collectively, to make decisions based on knowledge about the things that affect health her personal and others to increase the community's ability in maintaining his health and not just associate myself on improving knowledge, attitudes and practices, but also enhance or improve the environment (both physical or non physical) in order to maintain and improve the health of full consciousness. Sinta Fitriani [8] said that health education is a learning process which means that education occurs in the growth process, developments or changes toward more mature, better, more mature at the individual, group or the community. The health education is the process of behavior change healthy lifestyle based upon self awareness in individuals, groups or communities to maintain and improve health by applying the behavior patterns of healthy living. The process of changing student behavior at school one of them obtained from the process of learning in physical education sports and recreation.

Learning undertaken certainly has a goal, as well as health education. According to the Undang-undang Kesehatan No. 23 Tahun 1992 that the goal of health education, namely increasing the community's ability to maintain and improve the degree of health, either physical, mental and social so economically productive as well as social. Based on WHO the year 1954 in Sita Fitiriani [8] the goal of health education to change the behavior of people or society of unhealthy behavior or not healthy being a healthy behavior. You can conclude that the purpose of education is to teach people to know theirlilfe and apply a pattern of healthy living as a culture in everyday life.

The scope of health education can be seen from the various dimensions. The dimensions of the health education among other dimensions, the dimension of the education targets of the implementation and application and place the dimension level minions health (beautiful, 2013:143).

The problem in this research is how to model the development of health education materials for middle school students. This research aims to produce health education materials for the learning of physical education in junior high school.

II. MATERIALS AND METHOD

This research uses educational research and development, which is more familiar with the term Research & Development (R & D). Understanding research development according to Borg & Gall (1983) is a process used to develop and validate product education.

On the research of the development of this procedure, the development of health education materials made through several stages. These stages, among other things: 1) needs analysis by conducting literature review, observation and interviews, 2) sketch the initial product, 3) Validation expert, 4) revision of the initial Product, 5) field trials, 6) revisions to the final product, the final results of the form 7) development of health education materials for middle school students.

The following image is a draft product development health education materials for middle school students.

On the research of the development of these materials, the data retrieved is the quantitative data and qualitative data in the form of a reason in choosing answers and advice. The instruments used to collect the data researchers in his research is shaped instrument learning, the evaluation sheet and questionnaire.

III. RESULT AND DISCUSSION

Data obtained from filling the questionnaires by health education and physical education teaching is the expert guidelines for stating whether health education materials product deserves to be tested cobakan what does not. Following are the results of the questionnaire are charging from the experts:

TABLE 1. DESCRIPTION OF THE VALIDATION DATA EXPERTS

No	Expert	Average score Assessment	%
1.	Health Materials	3,23	80,7
2.	Learning Physical Education	3,18	79,5
Average		3,205	80,125

Source: expert evaluation sheet

See a table of the results of the evaluation of the questionnaire done by charging each expert, then results obtained by filling the questionnaires as follows: 1) expert health education i.e. 80.7%, belongs to the category of "good" 2) Expert teaching of physical education namely, 79.5%, belongs to the category of "good". So come by the average percentage of 80.125% and is included in the category of "good". From the results of the data then it can be inferred that the media health learning materials using health education for junior high school students eligible for field trials.

Data obtained from the questionnaire by charging physical education Teachers SMP Negeri 31, SMP Negeri 36, dan SMP

Negeri 37 in Semarang is guidelines for stating whether health education materials product deserves to be on the test used by the learners or not. Following are the results of the questionnaire are charging from teachers:

TABLE 2. THE RESULTS OF PHYSICAL EDUCATION TEACHER EVALUATION IN DATA DESCRIPTION

No	Physical Education Teachers	Average score Assessment	Persentase
1.	SMP Negeri 31 Semarang	3,54	88,63
2.	SMP Negeri 36 Semarang	3,45	86,36
3.	SMP Negeri 37 Semarang	3,86	95,59
Avernge		3,61	90,41

Source: teacher evaluation sheet

See a table of the results of the evaluation of the questionnaire done by charging each teacher, then results obtained by filling the questionnaires as follows: 1) Teachers of physical pendiidkan SMP Negeri 31 Semarang 88.63%, belongs to the category "very good" 2) Physical Education Teacher in SMP Negeri 36 Semarang i.e. 86.36%, belongs to the category "very good", and 3) Physical Education Teacher in SMP Negeri 37 Semarang i.e. 96.59%, belongs to the category "very good". So come by the average percentage of 90.41% and included in the category of "very good". From the results of the data then it can be inferred that the media health learning materials using health education feasible for use by learners in middle school.

At this stage it's product revisions made after analyzing the results of the field trials. Product revision at this stage is conducted to find out the weaknesses and advantages of the products developed. For these materials the product refinement, the researchers added some parts that is the addition of a summary of the material and problems. Granting the summary it is expected that learners can better understand the fine points of existing material, while the addition of questions made to measure how much cognitive ability learners. Product revision at this stage produces the final product in the form of media development health learning materials using health education for junior high school.

IV. CONCLUSION

Based on the results of analysis and discussion, then the conclusions that can be drawn from this study are as follows: 1) Based on the results of data analysis expert evaluation i.e. Expert health education gets a percentage of 80.7% and Expert teaching physical education gets a percentage of 79.5% so acquired average percentage of 80.125%. Based on predetermined criteria then the media learning materials health education for middle school students this first meets the criteria that can be used for learners in school. And 2) Based on the results of the data analysis the evaluation of Teachers of physical education teacher i.e. SMP Negeri Semarang 31 gets a percentage of 88.63%, teacher of physical education in SMP Negeri Semarang got 36 percentage of 86.36%, and Physical Education Teacher in SMP Negeri 37 Semarang gets a percentage of 96.59% so acquired average percentage of 90.41%. Based on predetermined criteria then the media learning materials health education for middle school students this first meets the criteria very well so it can be used for learners in school.

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Multilateral Model Exercise of Sprint on Track and Field for Elementary School

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***Abstract*—The learning orientation should be tailored to the child's development, content and material affairs as well as the way the delivery should be tailored so as to be interesting and fun. The aim of this research is to develop a multilateral model exercise of the sprint on track and field and to find how effective the model of multilateral model exercise that has been made. This research was using a research and development method. The result of this research is: developing 25 exercise of the sprint on track and field based on multilateral and the model was effective to increase the result of sprint for elementary school age.**

Keywords—Multilateral Model, exercise of sprint, elementary school, track and field

I. INTRODUCTION

Doing physical activity is very important in a child's development, with regular exercise can support the child's ability to concentrate on other subjects in school. This was stated by Bailey, Richard., Armour, Kathleen said that physical education has a role in the acquisition and development of children 's movement skills and physical competence[1]. Beside that physical activity also can improve children's concentration and arousal, which might indirectly benefit academic performance. Based on these results, the school should develop sports activities regularly and continuously. Sports activities conducted not only in the learning activities but also in activities outside of school hours such as extracurricular activities. It is as disclosed in a study conducted by Fischetti Francesco, Gianpiero Greco, which showed that: an extracurricular of physical activity performed using a multilateral approach might be more beneficial than having only standard programs at the school[2].

However, in reality, the school only performs activities of physical activity in the learning of physical education once a week. So, the children have limitations of time to do physical activity. Limitations of time in physical education lessons will encourage children to increase physical activity either through additional personal training programs or follow extracurricular in school. Because the ultimate goal of doing sports is to reach achievement in a competition. But the competition for children is different from adult athletes because the competition for children has aims to stimulate the children to perform a skill. Therefore, a coach needs a knowledge of how children grow and develop. The form of the game is a major part of the learning of motion in elementary school. To make learning interesting, the trainer must make a fun learning design so that students can develop the confidence and competence they have. It is stated by Virgilio, Stephen that "Young children are naturally active [3]. They love to play and express themselves through movement. Take advantage of this to promote fitness fun. Keep in mind that if children think an activity is fun and enjoyable, they will repeat it over and over again".

Based on the explanation above, it appears that there have been several studies related to the learning to improve the sport movement mainly elementary school children. However, not many people doing research on a model-based multilateral exercises to improve the ability to run fast on elementary school children. The concept of the development model created by the researchers is a model-based multilateral exercises which contain basic movement exercises run combined with the basic movements, jumping, throwing, catching, balancing, and so on. Multilateral notion advanced by Lubis[4] as the overall physical development.

Through this development of a child can perform natural movements such as speed, flexibility, agility, coordination and overall aspects of fitness in general. Multilateral development is important for children to develop basic skills that can help children become athletes in sports practice. This is supported by research conducted by Bruno Magnani, Manuel Rizzardini would be sufficient to improve motor skills in primary school children, although some neuromotor abilities could be improved through more specific exercises without creating particular damage"[5]. Bompa, Tudor believes that the exercise for general physical development lays the groundwork for further training by improving the quality of basic motion which is a major component of the multilateral program[6]. Thus it can be concluded that the multilateral exercise program is the

basic foundation of general physical development training so it must be given to the child.

Athletics is the mother of all sports and can improve the physical quality of the students so that more fit, it is not uncommon athletic become a tedious activity. Especially the running number. Running is a physical activity and basic motion needs to be tailored to the child's development. Thus, the coach must perform a wide variety of models running exercises combined into motion diverse (multilateral) or a game packed with interesting tools so that children are challenged to follow a practice run in accordance with the character's age and physical abilities of the child.

A short distance run number is a number that requires maximum strength and speed from the start line to the finish line. According to Dunville, Ben Lioyd Howey dan Ron Parker that: "sprinting is beginning in a stationary position, the objective of sprinting is to move from the starting position to the finish line as quickly as possible"[7].

Based on the explanation above, the purpose of this study was to develop a model based multilateral athletic training and adjustment to adopt a number of competition in an athletic contest for children called athletic kids but focus on running numbers. Additionally, to see the effectiveness of this type of training that has been made.

II. MATERIALS AND METHODS

The purpose of this research is: to develop a model based multilateral sprinting exercises for primary school children and to determine the effectiveness of improvement after being given quick run-based multilateral exercises that have been developed. The method used in this research is research and development. This methodology research suggest [8] research and development is an industry-based development model in which the findings of the research are used to design new products and procedures, which are then systematically field-tested, evaluated, and refined until they meet the specified criteria of effectiveness, quality or similar standards. This design was chosen to be used in clear stages.

The stages of research and methodology of Borg and Gall is illustrated in this image below:

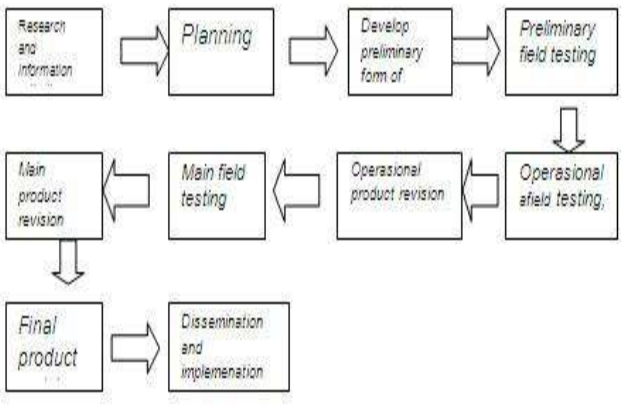

Fig. 1 Research and Methodology of Borg and Gall

III. RESULTS AND DISCUSSION

The results of this study can be seen based on the stages of the research and development that is used in this study are:

1. Preliminary research results. To find out the problems and the need for the problems examined, it is necessary to conduct a needs analysis with observation and interviews with athletes and athletic trainers. Observations found in the field, that if children do exercises run fast without using tools that are interesting or fast running drills without variation of motion then the child will feel tired and do not do the instructions given by the coach. In addition, it was also found that the majority of children liked running exercises packed with obstacles in groups using various training mediums.

2. Planning and model development. After analyzing the needs of the issues examined, the next is the planning and development of this type of training sprint is a model-based multilateral exercise. At this stage, the product came to be designed based on information about the problems and needs that run the basic motion problem fast for elementary school children. Products developed referring to the purpose of research is a model for fast run-based multilateral by adjusting the characteristics of elementary school children.

3. Validation, evaluation, and revision of the model. Before the development of a fast-running practice model was tested, the experts validated the developed multilateral fast-track practice model. Experts validate the exercise model based on the basic characteristics and motion required by elementary school children and athletic branches of fast-track numbers. Expert validation results say that the multilateral-based fast-track practice model is worth using. In addition to validation, experts also evaluate the design of the model made. Evaluations made by related experts on naming the exercise model, the distance between the tools used, the safety level of the students and considering the multilateral basic motion elements adapted to primary school children. After receiving inputs and suggestions from experts, a draft improvement of the draft model was developed to be used as a reference for product improvement prior to field trial. After obtaining validation, evaluation, and revision of the model, a small group trial was conducted by giving 25 models to Singapore International School Pantai Indah Kapuk West Jakarta.

4. Test for the effectiveness of the model. To examine the effectiveness of exercise models developed to increase the results of a quick run, the administration of the model-based multilateral sprinting exercises that have been revised. To get the effectiveness of the model, the test was taken before and after the treatment of the modeling of running practice was done. The test was a quick run test of 40 meters. Based on the results of the initial test and final test, the value of t_{count} = 7.79 and t_{table} = 1.70 at the 0.05 significance level. Therefore t_{count} is bigger than t_{table}, hence it can be concluded that multilateral fast-run training effectively improve the ability to run fast in elementary school age children.

Based on the results of the above research, it can be seen that there is a comparison of the results of a quick run before the applied model run quickly developed after the applied. Preliminary test results before applying the average fast-running practice model are 11.40 seconds. With the lowest record time is 17.54 seconds and the fastest time is 9.09 seconds. Meanwhile, after the implementation of the model of fast-running practice, the average time is 10.33 seconds. With the lowest time record is 16.87 seconds and the fastest time is 7.06 seconds. The development of this exercise model is based on an athletic competition created by IAAF for children called Kids Athletic. But the exercises are still less attractive, less varied and do not pay attention to the problem of growing children, so the exercise is felt very monotonous and boring. Whereas at the age of children, it takes a practice that leads to a multilateral motion. As the study by Ngadiman, which states that: "kid's athletics is considered as the athletic basic movement of experiences, athletics is more to the childhood of the early ages, and the implementation of multilateral development models"[9].

This is also supported by research conducted by Oleksandr Krasilshchikov which states that: "Multilateral training is often considered as a solution for overall development of young athletes[10]. Besides the obvious health-related benefits, physical activities help to unfold natural development potential in children. They get used to exploit their motor abilities in variable situations and intensities". As for some advantages of this product include:

1. Increased courage and running ability.
2. Present a game that fits the child's characteristics and child's motion skills, thereby increasing the child's motivation for athletic training, especially running numbers.
3. Students become more active, and enthusiastic in athletic learning with the use of simple and attractive training tools for children.

Based on the results of the above inputs can be concluded that the use of facilities and infrastructure is considered good for use in the training process because it is a tool that is safe for children. Children can be stimulated to move by using interesting tools, in which case the trainer can modify the tool according to the school conditions and student needs. Forms that are arranged in a creative exercise in accordance with the characteristics and needs of the child motion can increase the child's motivation in practice. Variations diverse movement by using multilateral principles can improve basic motor skills of children, especially in this case the ability to run fast. In addition, the coach can also modify the rules of the game to adjust the characteristics of the students, so that the process can run properly exercise and fun.

IV. CONCLUSION

The results showed that there are 25 models of running drills quickly developed a model based on multilateral and is effective for improving the results of a quick run on elementary school children. This model is expected to be a reference and provide ideas for trainers to train the sprint for children - elementary school children. Because of all this, this type of training given by trainers does not conform with the development of the child. The model was developed using a variety of basic movements and variations in the use of a simple and attractive so that exercise becomes attractive and can increase the child's motivation to practice.

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Swimming Learning Model for Elementary School Students who are Not Brave to Swim

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***Abstract*— Swimming is one of the materials in physical education taught to elementary school students. However, many elementary school students are not brave when having to learn swimming for various reasons. Therefore, this study was conducted with the aim to produce a model of swimming learning for elementary school students who are not brave to swim. This research was using research and development method from Borg and Gall. Subjects in this research are elementary school students consisting of 30 children. The instrument used in this research is a questionnaire and Modified test of water. The stages in this research are: (1) needs analysis, (2) expert evaluation (initial product evaluation); (3) limited trials (small group trial); (4) product revision and (5) main test (field testing). Based on the results of the study it can be concluded that: pool learning model developed can be applied to elementary school students so they dare to swim.**

Keywords*— *Learning Model, Swimming, Elementary School Student.

I. INTRODUCTION

Physical education is essentially an educational process that utilizes physical activity to produce a holistic change in the quality of the individual, both in physical, mental and emotional. Physical education emphasizes the whole aspects of education (health, physical fitness, critical thinking skills, emotional stability, social skills, reasoning and moral action). Physical education [1] is a medium to encourage the development of motor skills, physical abilities, knowledge, reasoning, appreciation of values (attitude-mental-emotional-spiritual-social), and habituation of healthy lifestyles that lead to stimulating balanced growth and development.

Bucher [2] stated that physical education is an integral part of the entire educational process, which has the goal of developing physical, mental, emotional and social citizens through physical activity that has been chosen to realize those goals. *"Physical education It is important to recognise that there are two types of aims: first, those which are unique to physical education, intrinsic to the subject and see physical education as an end in itself; and, second, those which the subject shares with other aspects of the curriculum, are extrinsic to physical education and use the subject as a means to broader educational goals"*[3].

According to BSNP [4] the scope of physical, sports and health education subjects for elementary / MI are as follows: (1) Games and sports include: traditional sports, games, motion explorations, non locomotor, and manipulative, athletics, soccer, basketball, volleyball, tennis, field tennis, badminton, and martial arts, and other activities. (2) Development activities include body attitude mechanics, physical fitness component, posture shape and other activities. (3) Gymnastics activities include simple dexterity with no tools, dexterity with tools, and gymnastics floor, and other activities. (4) Ritmic activities include free movement, morning gymnastics, SKJ, and aerobic gymnastics, and other activities. (5) Water activities include games in water, water safety, water movements, and swimming and other activities. (6) outdoor education includes picnic/field trip, introduction, introduction to the environment, camping, exploring and mountain climbing. (7) health includes: the cultivation of a healthy living culture in everyday life, especially those related to body care to stay healthy, nurturing a healthy environment, choosing healthy foods and drinks, preventing and treating injuries, arranging proper rest time and taking an active role in P3K and UKS activities, the health aspect is a separate aspect, and implicitly enters all aspects.

Based on the explanation above, then swim into one of the subjects taught in physical education at school. Swimming is not only a sport, but also a means to fill the spare time for pleasure oneself or for achievement. Understanding swimming is a movement to defend yourself in the water so as not to

drown while in the water. According to Putra [5] "the benefits of swimming are: 1) Eliminate the fear of water, 2) Means of play, 3) nourish the body and stimulate the motoric movement, 4) sharpening independence, courage and confidence, 5) Improving social skills". However, one obstacle for children to be able to achieve the determined swimming competence is to have the fear of swimming.

Fear is the psychological symptoms that arise from within oneself. Fear, when allowed to be more severe, is characterized by fear arising from the subconscious. Fear can come from both yourself and from outside. The fear of swimming is a fear because of things related to swimming, such as fear of drowning, fear of water with a lot of volumes, and other causes. Basically, the fear of water because it faces a new environment. To overcome the fear of water can be done by gradually manipulating the environment, that is by understanding the water itself. The fear to swim for a child for fear of drowning or fear of water can be minimized by the right approach with creative creativity required in a varied and appropriate approach to learning. Varied learning approach in this study is a gradual and inclusive approach that is tailored to the characteristics of elementary school age students. Thus, in this study, researchers will develop a model of swimming learning appropriate and varied to overcome the problem of swimming learning in elementary school-age students who dare not swim.

II. MATERIALS AND METHODS

The method used is a method of research and development. According to Borg & Gall, the method of research and development is a process used to develop and validate educational products [6]. The result of this research development method is to produce learning model that is used in swimming learning activities with the aim to help teachers in delivering learning materials so as to achieve the expected learning outcomes. Research development is not a research to test the theory but an attempt to develop a product so that it becomes effective and can be used as learning in school. The steps of development model as follows:

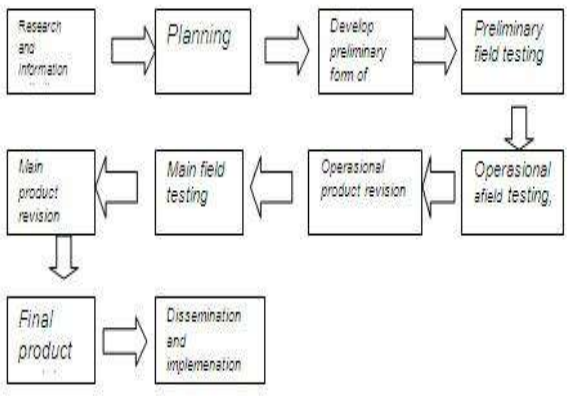

Fig.1 Methods of Borg and Gall.

The research subjects used were elementary school students Pinang Ranti 03 Petang. To know the potentials and problems, then the needs analysis by using interviews and questionnaires to elementary school students Pinang Ranti 03 Petang. After obtaining the result of requirement analysis, then the data collected as a foundation to make the draft of elementary school age learning model After doing the data collecting phase and making the draft of elementary school age learning model that did not dare to swim, the next step is to test the expert where the intended purpose is achieved by obtaining the feasibility or validity of the model made by direct assessment from the experts by presenting 3 experts. The next step after the model revision phase II of the expert then proceeded to test the product to large groups by using research subjects as many as 30 elementary school students consisting of 3 primary schools, SDN Pinang Ranti 03 Petang East Jakarta, SDN Pinang Ranti 01 Pagi East Jakarta and SDN Makassar 06 Pagi East Jakarta.

III. RESULTS AND DISCUSSION

In accordance with the stages in research and development methods used it can be known the results of the study as follows: The needs analysis results show that: there are 32.55% 5th-grade students who cannot swim, and 29.41% of them have the fear to swim. (2) the students had never received the model of swimming learning that was fun, (3) the students were happy with the swimming materials, (4) the students had never get swimming learning models during swimming, (5) students agree when developed swimming learning models for elementary school-age children who dare not swim. Thus it is necessary for a real effort to solve the problem. Because swimming is one of the important skills for students as a supporter of the growth period, but also able to be an effort to equip themselves for saving themselves in the water environment.

The next step is to test the validity conducted by experts. Based on the validity test, it can be concluded that the variation of swimming learning model for elementary school students who dare not to swim feasible and can be used in elementary school age balance learning. Expert test conducted by researchers of the two experts, there are several constructive suggestions to enhance the balance of primary school-age models among which:

1) The implementation guidelines should be made clear so that they are easy to understand.
2) The model used in the drawing should be elementary school age children.
3) Applied models must be systematic and gradual from easy activities too difficult or complex activities.
4) The swimming learning model should be documented with an authentic photo.

The next step after the model was revised phase II of experts then proceed with the testing of the product to the large group using the study subjects were 30 elementary school students consisting of three primary schools, SDN Pinang Ranti 03 Evening East Jakarta, SDN Pinang Ranti 01

Morning East Jakarta SDN Makasar 06 Pagi East Jakarta. The following comparison of the results of the level of students' abilities to perform activities in water prior to administration of the treatments and after the treatment with an outdoor learning model for school-age students who do not dare to swim base with charts:

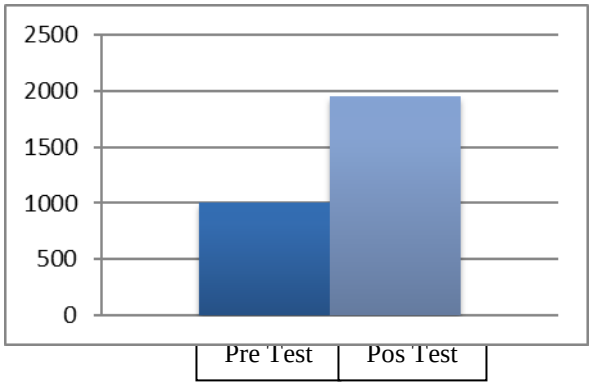

Fig. 2 The result of pretest and posttest.

According to the chart above, it can be seen that the results of small group trials and large group trials can be concluded that swimming model lessons for elementary school students who are not courageous to swim can be used in learning as well as feasible and effective to improve students' ability to perform activities in the child's water.

Based on the scoring in the table above it can be concluded that the model of swimming lesson for elementary school age students, for who not Brave Swim can and deserve to be used in an effective learning and to improve the students' activity in the water. There is a comparison of figures showing that the results of the initial test and final test progressed, from the initial tests which amounted to 1010, and was given treatment in the form of models that have been developed then held until the final test or post-test to determine the effectiveness of the models developed and the data obtained amounted to 1950, so the swimming lesson model for primary school elevate students swimmer is effective to improve students' ability to do water activities.

The swimming Lessons for the elementary school students who are developed and created by researchers are products that aim to assist teachers in delivering swimming or water activities, increasing courage and student activity abilities in water, and as reference materials. Swimming Learning Model for primary school students is made based on the level of student needs in activities learning physical education, especially swimming materials or activities in the water in elementary school. This product after reviewing some of the advantages and disadvantages that need improvement. Here are the benefits of this product:

1) Increase the courage and ability of student activity in water
2) Students become more active and enthusiastic about swimming learning
3) Students feel comfortable and secure in physical education learning
4) Lesson Learned Models for Primary School Elite Students are not Courage to Swim effectively and efficiently
5) Assist teachers in delivering swimming or water activities
6) As a reference to teaching materials
7) Contributions to science, especially physical education in school
8) Models of Swimming Learning Models for Primary Elementary School Students Dared to Swim This is done from easy to difficult.

However, the research also has drawbacks. The limitations are as follows:

1) Field trials of this research will be even better if done on a wider scope again
2) The product used is still far from perfect.
3) The facilities and infrastructure used are still limited.

Explanations and rules in the model of swimming lesson for primary school students to swim is still far from perfect.

IV. CONCLUSION

Based on data obtained from field trial results and discussion of the results of this study concluded that the developed model can be applied in teaching physical education to improve students' ability to perform activities in the water. In addition, an outdoor learning model that has been developed and effectively to increase students' ability to perform activities in the water child..

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The Role of Blended Learning on Cognitive Step in Education of Sport Teaching by Adjusting the Learning Style of the Students

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***Abstract*—Education of sport teaching is often done by using face to face teaching where the teaching model is only effective for the students with kinesthetic learning style. However, for the students that have visual and auditorial learning style, it is less effective to use only face to face teaching. The purpose of this article to determine the level of eligibility of blended learning as a learning that is able to facilitate learners who have a diversity of three learning styles in learning sports education. The method of writing articles using meta analysis. The field of study is a component related to mixed learning in sports education. The result was that the students were interested in the blended learning and the effectiveness of the learning increased. Therefore, it is expected for the students to do the learning using blended learning. Besides doing face to face teaching, the teacher is also expected to be able to develop the teaching sources in form of video and audio to be the facility in online and offline learning that can be used for the students with visual and auditorial learning style.**

Keywords—blended learning, cognitive step, education of sport teaching, learning style

I. INTRODUCTION

Sport teaching and learning is always close to physical activities. One of the physical activities that is usually done by students is movement learning to master a skill. Dacica (2015) stated that the function of physic and sport teaching and learning is biological, movement, psychological, and social that is related to the concept of balance and unified character development. Based on that statement, one of the functions of sport teaching and learning leads to the students' movement learning[6].

Movement learning is needed some steps to master certain skill. Makino, Ren, Liu, Kim, Kondapeneni, Liu, Kuzum, and Komiyama (2017) said that skill learning is done through three stages of sport teaching and learning, that is: (1) cognitive stage, (2) association stage, (3) automation stage[11]. In the cognitive stage, the teacher gives a material understanding to the students about a new movement in what and how it is done. The association stage is done after the students answered the cognitive questions and made an organization of effective movement pattern to produce a movement by constructing control ability and attitude consistency and self-confidence. In the automation stage, after doing the exercise, the students are leaded to the automation stage step by step, the movement have developed well and they can control the movement in a short time.

Narayana, Zhang, Rogers, Strickland, Franklin, Lancaster and Fox (2014) also mentioned that the three stages of movement learning are cognitive learning stage, association learning stager, and autonomous learning stage[15]. The transition from association to autonomous stage is marked by the movement mastery, so that it can be concluded that autonomous stage has the same meaning with automation stage.

The first stage of movement learning is cognitive stage. So, this stage can be the success of the movement learning base. If the process of cognitive stage is well done, the best result will be obtained and vice versa. Therefore, in this stage, the teacher has to facilitate the students well to obtain knowledge and information that can be understood by the students. As what stated by Kim, Edens, Iorio, Curtis, and Romero (2015) that learning and understanding needs to be strengthened by cognitive skill development to enable practice knowledge and implementation treatment[8].

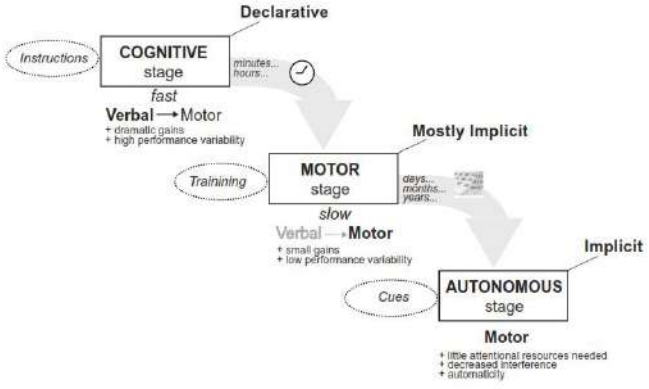

Fig. 1. The Model of Movement Learning Stages (Marinelli, Quartarone, Hallett, Frazzitta and Ghilardi, 2017)[12]

Cognitive stage specifies the success of learning and even influences the next stages of movement learning in sport teaching and learning. That is why, when the teaching process is done, the teacher should really understand the condition and capacity of students learning. One of the important things is that the teacher should really understand the students' learning style characteristics. Rassool and Rawaf (2008) figured out that learning style covers visual, auditorial and kinesthetic learning style[21]. Those learning styles are commonly known.

Alrabah, Wu, and Alotaibi (2018) explained that students with visual learning style prefer to study by seeing[1]. It means that they have good visual memory and prefer the information presented visual, in form of diagrams, charts, maps, posters, and displays. By knowing those students' learning style, the teacher has to be able to give learning facility that is appropriate to that students' visual learning style. Brown and Palmer (2012) explained that auditorial learning style describes those who can study well through listening instruction like lecturing, discussing and recording[4]. Thus, the teacher can give learning facilities that make the students obtain information in form of sound. Asiry (2016) also explained that kinesthetic learning style is learning through touch and experience that stress in doing, physical involvement, and object manipulation[2]. For the students with this learning style, the teacher can give the lesson in form of experience and practice.

Leasa, Corebima, Ibrohim, and Suwono (2017) said that sport education is more appropriate using kinesthetic learning style, but the students are still needed to involve in several learning style, for example sport and games clues can also be in form of written and spoken[10]. For the students with kinesthetic learning style, it is no matter. They will learn more effective by given a demonstration and will learn from the participation experience in that activity. Raid's statement has a meaning that kinesthetic learning style is not always appropriate in teaching sport. There may be some students with visual or auditorial learning style. By considering various kinds of the students' learning style, the teacher is expected to be able to create learning atmosphere that leads to visual, auditorial, and kinesthetic learning style.

Nowadays, there is an innovative teaching called blended learning. One of the purposes of blended learning is to facilitate the students with the various learning style. It is because in blended learning, it covers several learning models that is face to face, online, and offline. Lalima and Dangwal (2017) stated that blended learning is the most logic and natural evolution of our teaching agenda[9]. It shows the elegant solution for the challenge in making teaching and individual needs appropriate. It is an opportunity to integrate the development of innovation and technology that is offered by online learning using interaction and participation offered by the best traditional learning.

It is mentioned that online teaching and learning is a part of blended learning. Online teaching and learning is the teaching and learning that leads to the students to access learning resources using internet access or the students can interact with the teacher using internet. If the teacher has no time to interact with the students, the teacher can provide the relevant learning resources to be accessed by the students later. It is in line with the statement of Ugurlu (2013) that online teaching and learning enables the students to access multimedia online that contains video or audio related to the material to learn anywhere and anytime[24]. Beside it can be accessed online like what Ugurlu said, the material provided can be downloaded and taken as offline teaching material if sometimes the internet access cannot be connected.

In line with the implementation of online teaching, many teachers consider that by implementing online teaching, the learning objectives will not achieve effectively. The reason is that technology facilities used in the teaching and learning process will distract the students' attention to do negative activity rather than using it to access learning material. However, Chen (2015) states that in the development of this era, it is not the technology that is used as a negative reason but the user's policy, that is the students, so that teachers should be able to direct and control the students to use the technology available for learning activities[5]. Matukhin and Zhitkova (2015) the use of new information technology tools contributes to the humanization of the teaching and learning process[13]. These statements imply that the inevitable progress of the time can be done to remain wisdom in self-conditioning of times. So is learning that uses a variety of advanced facilities today. The use of technology will actually contribute positively for education. In order to make these technologies can be controlled, the teachers attempt to create a system so that the use of the technology can achieve the goal of learning effectively.

In addition to online and offline learning combined in blended learning, there is also face-to-face learning. Face-to-face learning is often referred to traditional learning. Millan, Semer, Rodrigues and Gianini (2012) suggest that learning by traditional methods is done face-to-face between students and teacher where the teacher monitors and controls the learning directly[14]. Such traditional or face-to-face lessons can be used in clarifying the students' understanding while learning by using online and offline teaching materials, giving the students the opportunity to inquire about the material that have learned and also face-to-face lessons used for practice by using the understanding when they learn online and offline.

Thus, blended learning which includes online learning, offline and face to face can facilitate all students who have a variety of learning styles on sport teaching and learning. Online and offline learning is expected to facilitate the students who have visual and auditorial learning styles. Because in online and offline learning, it provides learning media in form of a video that contains a motion of skills and also given explanatory sounds related to the movement of skills learned by the students. Then, in face-to-face learning, the learning materials are strengthened by the presence of the teacher with the understanding of the students obtained while learning online and offline.

In this article, the researcher discussed and analyzed the process of sports teaching and learning at the cognitive stage by adjusting the students learning style. For example, by implementing blended learning in sports teaching and learning, the instructional materials in form of multimedia are given to

the students and the application of learning systems is online and offline. Then, it will be known how effective the process is and how the responses from various parts related to each others.

II. MATERIALS AND METHODS

The method of writing this article is by using meta analysis. Meta-analysis is one of the efforts to summarize the various research results quantitatively. Meta-analysis as a technique intended to re-analyze the results of research. Sources obtained from some research results because they are considered as primary data collectors. The subject of the study is the parties involved in learning sports education such as teachers, lecturers, students and students of sports education. The field of study includes various components related to blended learning in sports education such as blended learning support media, blended learning system and blended learning model.

III. RESULT AND DISCUSSION

The research related to blended learning in the learning process has been done a lot. But in this article, it will be studied about the results of research on the application of blended learning associated with sport teaching and learning. The following will be presented some research results of the application of blended learning on learning sports education.

The first study was related to the learning of blended learning based badminton courses conducted at PGRI University Banyuwangi Study Program of Education of Physical Sport and Health. The research was conducted by developing the instructional materials for online and offline learning which contains about all badminton material. Then, the teaching materials were used in learning activities in badminton courses. After the learning activities conducted in several meetings, the researcher took the data related to attractiveness, clarity, ease, and effectiveness. In addition, students were also given several times of test to measure the level of effectiveness and efficiency of the learning.

The criteria of attractiveness reached a percentage of 82.36%. On the clarity criteria, it reached a percentage of 81.33%. On the criteria of ease, it reached the percentage equal to 82,08%. In the criteria of effectiveness, it reached percentage of 83.33%. The overall average was obtained at 82.18%. Based on the average data, Sandi (2017) states that the development of learning based on blended learning based badminton courses is very valid[22].

The second research was the tennis learning by using interactive multimedia which is done by the students of Physical Education and Health Department of State University of Malang. The research was conducted with an interactive multimedia development step that contains all the tennis materials. Then, the interactive multimedia was used in the learning activities of tennis course as students' learning materials. After the learning activities conducted in several meetings the researcher collected the data related to attractiveness, ease, clarity, feasibility and accuracy. Students were also given pre-test and post-test to measure the level of effectiveness of the interactive multimedia that had been developed.

In the criteria of the interactive multimedia attractiveness, it was obtained the percentage of 95.1%. In the criteria of the interactive multimedia ease, it was obtained the percentage of 92.2%. In the criteria of the interactive multimedia clarity, it was obtained the percentage of 93.9%. In the criteria of interactive multimedia feasibility, it was obtained the percentage of 95%. In the criteria of interactive multimedia suitbility, it was obtained the percentage of 94.1%. Then, from all the data, it was obtained the average percentage of 93.6%. From that average, Raibowo (2017) stated that interactive multimedia which contains subject matter in the tennis lesson is very valid and can be used as learning materials for students[20].

In addition to the data related to students' responses to interactive multimedia used in learning tennis courses, it was also obtained pre-test and post-test data from the students. The data consisted of normality test and paired-test data to know the effectiveness of the interactive multimedia developed. Furthermore, the average of pre-test 64 is less than the average of post-test 80. Thus, Raibowo (2017) stated that interactive multimedia is effective for tennis learning[20].

The third study of blended learning on futsal learning. The subject of the research is the students of Physical and Health Education at State University of Malang who follow futsal subjects. The results of this study obtained data about subject responses to blended learning about futsal, learning effectiveness and learning efficiency.

The result of the research is 87% of subjects stated that blended learning futsal has several eligibility criteria. These criteria include clarity, conformity, suitability, easy and attractiveness. So blended learning about futsal is valid and feasible to be used in learning process. Then the researchers to test the effectiveness of learning measured through pre-test and post-test. The data obtained is processed by using statistical calculation. The result Baidhori (2017) states that blended learning in futsal subject can improve learning outcomes[3].

Subsequent research on learning media used in blended learning Physical Education. Research is done by developing teaching materials for face-to-face, offline and online learning. Then the teaching materials used by subject of eleven grade students SMK N 3 Boyolangu Tulungagung as many as 30 people. Once used in learning, students respond to blended learning materials used in physical education. the feasibility of blended learning materials in physical education learning obtained a percentage of 89.03%. So Putra (2017) states that blended learning material on Physical Education is worth to be used[18].

Further research is about teaching materials in the form of interactive multimedia used in blended learning. Multimedia interactive contains swimming material and research done to the student of Physical Education and Health Education of State University of Malang. From the research results obtained average percentage of 93.19%. So Setyawan (2017) stated that interactive multimedia for mixed learning is suitable for use in pool learning[23].

TABLE 1: FINDING DATA FROM RESEARCH

Researchers	Aspect								
	Attractiveness	***Clarity***	***Ease***	***Feasibility***	***Suitability***	***Conformity***	***Benefits***	***Effectiveness***	***Efficiency***
Sandi (2017)	82,36%	81,33%	82,08%					The first meeting was 75.6% (thoroughly complete) The second meeting was 81.2% (very complete) The third meeting was 82.4% (very complete)	The first meeting is 547,08 seconds The second meeting is 543.44 seconds The third meeting is 517.8 seconds
Raibowo (2017)	95,1%	93,9%	92,2%	95%	94,1%			The average of pre-test 64 is less than the average of post-test 80.	
Baidhori (2017)	91%	90%	88%		87%	87%			The subject is able to master the material within five days.
Putra (2017)	Textbook 88,06% Autoplay 88,96% Edmodo 89,79%	Textbook 88,83% Autoplay 88,13% Edmodo 90,56%	Textbook 87,50% Autoplay 88,67% Edmodo 90,33%						
Setyawan (2017)	92,77%	93,07%	93,33%				94,16%		

Face to face strategy in sport teaching and learning has limited time. While face-to-face learning should be divided into several stages such as the delivery of material, giving examples, the implementation of practice by the students and evaluation by the teachers against the practice of the students. From the stages in physical teaching and learning by using face-to-face process, it is certain that the time required should be more. But, in reality, the time given is very limited. The time is also included for heating and cooling exercises.

The students who have kinesthetic learning style will be learn maximally using face-to-face learning. However, face-to-face learning will be less effective to deliver to the students with visual and auditorial learning styles. Therefore, to overcome this problem, there needs to be an additional time to learn outside face-to-face learning time. Learning outside face-to-face learning time should be appropriate to the learning needs of the students who have visual and auditory learning styles. So, it is possible for learning outside the face to face learning time to be done with the teaching video and audio materials facilities.

Seeing the problem about the needs of learning models such as learning model needs, then blended learning can be a solution to solving the problem. Blended learning is appropriate as a problem solver because blended learning is a mixture of several learning models ie face-to-face, online and offline. On online and offline learning, it can be done outside of face-to-face learning time or anywhere. Learning online and offline can be given as a teaching materials in form of video and audio that facilitate the students with visual and auditorial learning style.

Blended learning can be done in the present because today's technology can be a facility to do blended learning. The students in the current generation has used a variety of cutting-edge technology today. In accordance with some opinions submitted by some of the following researchers, Rahman, Hussein, and Aluwi (2015) blended learning can improve the quality of learning by attracting students and providing better platform and exposure[19]. Okaz (2015) stated that new generation comes with a digital background, thus blended learning approach can be very useful because it will improve the quality of learning and improve students' access to get the information[17]. Nazarenko (2015) said that studnets are sensitive and responsive to new technologies and this should be used to motivate them to use technology in learning[16].

The results of the research data that had been studied above showed that students' responses to blended learning and media that support the learning obtained a high percentage. It also showed that blended learning and its supporting media made the students interested. In line with the statements of Hubackova and Semradova (2016) on another study that blended learning is not only acceptable but also highly favored by students[7].

In addition, the effectiveness test in this study also showed that blended learning and the supporting media also made learning more effective. It can be proven in the result of the study that there was an increase in the test of the students related to the material being studied. Other studies also showed the effectiveness of blended learning. As stated by Yigit, Koyun, Yuksel and Cankaya (2014) that blended learning shows that learning is more effective, learners' achievements are better than expected rather than using traditional learning[25].

IV. CONCLUSIONS

Sports teaching and learning is always identical with the practice of motion learning. Learning self-motion has a stage that is the stage of cognitive, associative and automation. The cognitive stage is the most fundamental stage of motion learning. At this stage students are expected to gain a lot of information and knowledge, and learn to understand. In the learning process, there are three learning styles that is visual, auditorial and kinesthetic learning style. Sport teaching and learning is less effective if it is only done using face-to-face learning because face-to-face learning is only effective for the students that have kinesthetic learning style. In addition, limited time also affects the effectiveness of learning. While the students who have visual and auditory learning styles also require a sufficient time to learn.

Todays, the development of blended learning combines learning face to face, online and offline. Learning is not only done face to face but also can be done online and offline. Online and offline learning can be done by learners beyond face-to-face learning and can be done anywhere without the teacher. So, it can be said that this learning provides opportunities for students to learn by using the time needed. It is proven in various research that blended learning and supporting media motivate students to learn. it is also found that the effectiveness of learning is also increasing because blended learning is able to facilitate the students with three learning styles.

Face-to-face learning can be maximized for the students who have kinesthetic learning style. While the online and offline learning can be maximized by learners who have visual and auditorial learning style through materials that are packaged in the form of video and audio. Therefore, it is expected that the teacher provides additional learning facilities that is the material packaged in the form of video and audio. So that, students who have visual and auditorial learning styles can learn independently by obtaining valid material from the teacher. If it can be done, it will be able to maximize the learning process of sports education because the current generation is familiar to advanced technology.

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The Perceptions of Undergraduate (S1) Students of Physical Education, Health, and Recreation on Non-Formal Education Course in Regular Class of Odd Semester 2017/2018

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***Abstract*— The present research is aimed to analyze and study students' perceptions on Non-formal Education course. This research was survey research with quantitative descriptive approach. The instrument of the research used questionnaire and the indicators were knowledge, proficiency and learning process. Sample of the research was 20 students and it was collected by using purposive random sampling. Further, the obtained data was analyzed by using quantitative descriptive. The results show that the data of the fifth semester students' perceptions of Physical Education, Health, and Recreation (PEHR) on Non-formal Education was 90.576% and it was interpreted in very high category means that the lecturer's proficiency was very high. The knowledge indicator was 75.535% and it was interpreted as quite high, it means that the lecturer had high knowledge and he knew enough about the course he was teaching. The indicator of learning process was 79.125% and it was categorized as quite high. It means that teaching and learning process satisfied the teaching and learning activities (KBM) planned in Semester Learning Plan (RPS). Based on the results it can be concluded that the lecturer was in high category. The category was interpreted from the average results of the research of 81%. The suggestion given to the lecturer of the course is that he should improve his students' perception level by adding quantity of the meeting in learning process due to additional tasks in management series, so that there is still 19% to be achieved.**

Keywords— Students' Perceptions of PEHR, Non-formal Education Course. (*key words****)***

I. INTRODUCTION

Learning in University should pay attention to input and output process element, so that it is directly proportional to the goals to be achieved. University in doing its learning process should have road map/clear and structured rules that have to run, in the academic there should be CPM and CPMK in every course. CPM and CPMK must be described in RPS so it does not deviate from the rules and there should be a progress in learning process, and a lecturer or instructor in doing his task and function needs an evaluation and feedback from outside parties, in order to make his teaching process not to be out of the existing road map. The road map is reflected by the achievement of the course in the RPS (Semester Learning Plan).

In addition to looking out from the point of view of achievement in the RPS, the researcher also observes the characteristics of the students in Non-formal Education course, from the knowledge they have gained, the maturity of their attitude and behavior, and their movement skill are different but they indicate the maturity, spirit, enthusiasm and seriousness in following the course which have high hard work, discipline, solidarity and team work among them.

Another side of students' point of view in giving their perceptions and assessments, perception of the lecturer's seriousness in teaching Non-formal Education course, perception of the skill in teaching, perception of spirit, the lecturer's attention in teaching, perception of the lecturer's proficiency towards students in teaching, perception of quantity of meeting in lecture, and perception of the lecturer's activities in department management in developing institution of the course.

Demanding that the lecturer has tasks in teaching, observing and devotion, then he is responsible for the tasks, but there are also some lecturers that get additional tasks from the head to help department management, and sometimes the tasks are time-consuming because they should teach and do the job in management. Occasionally, department management tasks are incidental (if there is a guest, visit, etc.) and need to do immediately, or the tasks are routine programs to serve students, so it is necessary to manage time and good personal management, this kind of situation and deficiency is realized, and the lecturers try to change the lecture at certain time and day, but it is not maximal because students have difficulty when there is a change of lecture time, because the schedule has been made in the system, moreover Non-formal Education

has 6 study groups/classes, in one day there are 3 parallel study groups, means that in two days there are 6 parallel study groups, so that a good coordination is needed if there is a change of lecture time so it does not collide with the other courses.

With the heavy course load in the fifth semester then students' perceptions on Non-formal Education needs to be observed. The forming of perception is started by observation through the connection of seeing, touching, feeling, and accepting something and then one will select, organize, and interpret the information he gets as a meaningful description. The observation is affected by past experience and attitude of an individual. Typically this perception is applied for himself and not to others. Besides, it does not last a lifetime and can change with the development of experience, changing needs, and attitudes of a person both male and female. Perception has two meanings, direct response or acceptance from a process and a process of knowing some things through one's senses, in Indonesia Dictionary (2005: 863). According to Toha [1], perception is a cognitive process experienced by every person in knowing the information of his environment from his sight, hearing, appreciation, feeling and smell. Whereas according to Sugiharto [6], perception is the ability of the brain to translate the stimulus or process of translating the stimulus comes to human senses.

Perception is divided into two forms, positive and negative. Furthermore, Robbins [5], adds that positive perception is an individual assessment on an object or information with positive view or as expected of the perceived object or rules. While negative perception is an individual assessment on an object or information with negative view and it this is contrary to the expected of the perceived object or rules. The cause of one's negative perceptions may because of individual dissatisfaction with an object that is the source of his perception, individual ignorance and the absence of individual experiences against a perceived object, and otherwise positive perception may because of individual satisfaction with an object that is the source of his perception, the presence of individual knowledge and the presence of individual experiences against a perceived object.

Based on the opinions it can be concluded that perception is a direct response of every person that may be both positive and negative in understanding information about the surroundings through his senses. There are some factors that affect perception, according to Baltus [2], the factors are (1) ability and physical limitations and senses (2) environmental conditions (3) past experiences (4) needs and desires and (5) beliefs. Based on the opinions, it can be known that the factors are from the inside and outside of an individual. The factors come from the inside of an individual are ability and physical limitations and senses, past experiences, needs and values he have, and selective attentions. Factors come from the outside of an individual are traits of excitement and environmental conditions. So the factors make a perception of each person different to an object.

Whereas according to Veithzal Rivai [9], one's attitude based on the perception is about what the reality is not the reality itself, so the same object can be perceived by an individual differently, it is affected by some factors: (1) factors of the perceiver, including: attitude, motive of interest, interest, experience, and expectation of the individual; (2) factors of a perceived object or target, including: new things, movement, sound, size, background, and proximity; and (3) context situational factors where the perception is done, including: time, condition of the place and social condition.

From the experts' opinions, it can be concluded that perception is a response, assessment or one's response on an object or certain event. In the present study, there are three factors that affect the formation of the students towards the use of learning facilities: (1) factors of the perceiver, including: attitude, motive of interest, interest, experience, and expectation of the students towards learning facilities; (2) factors of a perceived object or event (learning facilities), including: arrangement and maintenance of learning facilities; and (3) context situational factors where the perception is done, including: time, condition and quality of learning facilities.

II. Material and Method

The research method is a way taken by researchers to collect empirical data using data collection tools. The present research used quantitative approach. In is in accordance with Sugiyono's [7] opinion that quantitative research is a research approach that the research data are numbers, and the analysis uses statistic. The type of research in this research was descriptive research. It is descriptive because the research aims to view and describe the fifths semester students' perceptions of PEHR in following Non-formal Education course academic year 2017/2018.

Riduwan and Akdon [4] explain that sample is a part of population which has certain features or conditions that will be examined. Not all of the data and information will be processed and not all of the people will be examined but simply by using the representative sample.

There were two types of sampling techniques used in this research, according to Riduwan and Akdon [4] they were probability sampling and nonprobability sampling. In determining the number of samples, the researcher referred to table determination of the number of samples from Sugiyono [7], with the level of error interval 5%. The sample was 22 students.

According to Riduwan [3] research instrument is used to measure the value of variables to be studied. Meanwhile according to Arikunto [9], instrument is an assistance tool chosen and used by the researcher, in his activity to collect data in order to make the activity systematic and easy. Based on the definition, this research used questionnaire and inquiry as the instruments.

Data analysis is an activity done after all respondents or sources of data were collected. In this research the technique used was descriptive analysis data.

TABLE I. PERCENTAGE INTERPRETATION

Percentage	Classification
90%-100%	Very High
80%-89%	High
70%-79%	Quite High
60%-69%	Medium
50%-59%	Low
49% below	Very Low

III. RESULTS AND DISCUSSION

TABLE II. THE RESULTS OF THE FIFTH SEMESTER STUDENTS OF PEHR ON NON-FORMAL EDUCATION COURSE

The number of respondents 20 students	Indicator		
	Proficiency	*Knowledge*	*Teaching and Learning Process*
Σ	942	423	633
%	90,576	75,575	79,125
total %	245,236		
mean %	81,745		

Based on the results of inquiry, new students' perceptions on Non-formal Education was 90.576% for the indicator f the lecturer's proficiency, 75.575% for the lecturer's knowledge of Non-formal Education and the indicator of teaching and learning process was 79.125%.

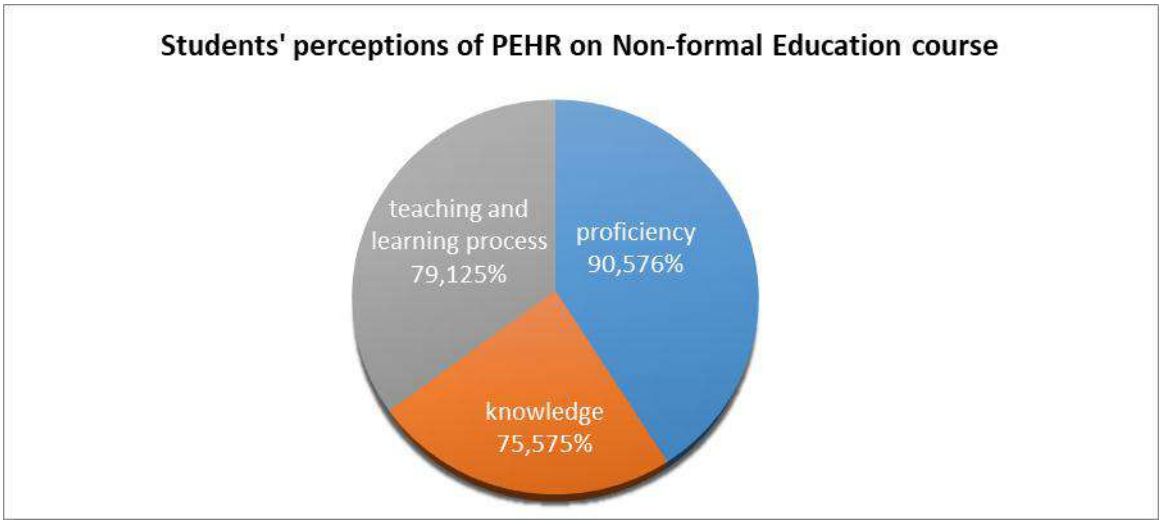

Figure 1. Diagram of Perception Indicators

In total, the average was 81,745%. The expectation is the average is 100% because it is expected that the lecturer is able to master everything in teaching process. However, there was a 19% gap.

A.

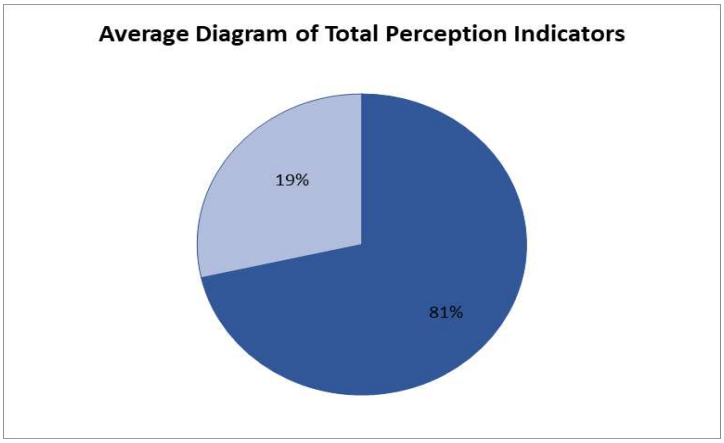

Figure 2 Average Diagram of Total Perception Indicators

The fifth semester students' perceptions of PJKR FIK UNNES on Non-formal Education course was 81.745% and it was interpreted as high category, it means that the lecturer's proficiency in teaching Non-formal Education course had high proficiency or that students' perceptions on the lecturer's proficiency was high. This indicator can be seen from students' satisfaction in accepting the achievement of the course for their knowledge, attitude and skill, moreover in the end of the course the evaluations were carried out in an open space, including practicing outbound, exploring, individual and group creativity, and ended by rafting.

IV. CONCLUSION

Based on the results it can be concluded that the lecturer was in high category. It was interpreted from the average results of 81%. The lecturer of Non-formal Education course was considered as high in doing the criteria and achievement planned in learning plan. The suggestion is given to the lecturer of the course to improve students' perceptions level because there is still 19% to be achieved if students are expected to have 100% perception or very high category.

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Revealing Physical Education Students' Misconception in Sport Biomechanics Linear Motion

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***Abstract*— The aim of this research is reveal misconception in Sport Biomechanics Linear Motion. The Data of misconception collected by standard question of diagnostic test that given to students of Physical Education, Faculty of Sport Science, State University of Surabaya. The samples choose using simple random sampling method. Diagnostic Test completed with open reasoning and CRI (Certainty of Response Index). Students' answer combined with graph of CRI right, CRI wrong and right fraction in every single question to observe the exist of misconception than categorized into four quadrants, these: correct concepts, lucky guess, misconception, and lack of knowledge. Open reasoning of diagnostic test used to analyzed kind of misconception that arise in linear motion concept. The result of students' answer showed that kind of misconception arise in linear motion concept are differences distance and displacement, differences velocity and acceleration, and free fall motion. Results of t-test in diagnostic test categorize misconception showed that percentage of misconception arise is very high.**

Keywords*— *Misconception, Sport Biomechanics, Linear Motion

I. INTRODUCTION

Humans have a structure of knowledge in the brain like boxes containing meaningful information that is different [1]. Especially, students present at school with diverse experiences and ideas or thoughts on learning materials based on natural behavior everyday [2]. The breadth of the idea differs from the background of the student and is usually different from the ideas the scientist has. The differences in the frame of mind have been described as misconceptions [3], alternative conceptions [4], preconceptions [5], alternative thinking frameworks [6], false ideas [7], and children's science [8]. To simplify the discussion, we use the term "misconception" to express ideas or thoughts that students have that are inconsistent or conflict with the generalization of ideas received by scientists [9]. Misconception is an interpretation of concepts in an unacceptable statement [10]. Brown states that misconceptions are a false explanation and an idea that is inconsistent with the scientific understanding that experts accept [11].

Sport biomechanics is one of the study in sports education that emphasizes mechanical approaches in analyzing the movement of a professional athlete to get maximum movement. General understanding Biomechanics has been defined as the study of the movement of living things using the science of mechanics [12]. Some important mechanical concept approaches in sports biomechanics are the concept of friction, distance and displacement, speed and acceleration, and free fall motion. The wrong concept if owned by the student will lead to errors in the analysis of sports movement. Students in sports education majors are also prospective sports teachers, if the wrong concept is left then it is feared will be a source of new misconceptions in the future when working in the field of sport biomechanics.

Sport science undergraduate education, one of which purposes is to produce an analyst in sport [13]. However, generally misconception of Sport Biomechanics is still relatively very high [14]. The background of Sports Education students which 60% from high school with Social Sciences contributes to the maturity of biomechanics materials held by students. Many students' preconceptions are not appropriate and only on the wrong assumption. Here is the background of previous education from students majoring in Physical Education Department:

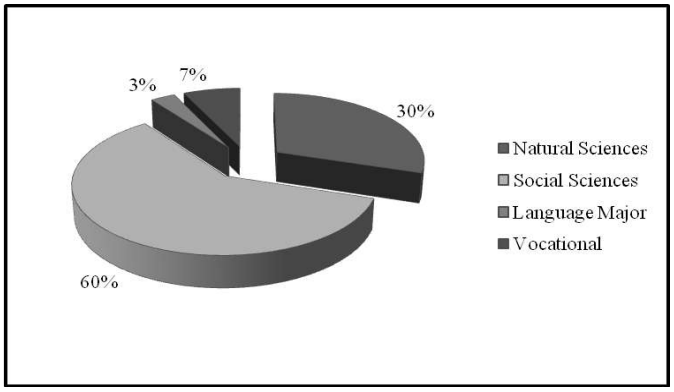

Fig. 1. Distribution of previous education background from sports education students.

Several previous studies relevant to this research include Suana [15] which concludes that as many as 36% of prospective students have mechanical misconceptions. Tunc found that as many as 301 prospective teachers from various universities in Turkey experienced misconceptions on some Mechanics topics [16]. Bayraktar also found that the misconception of a potential physics teacher in Turkey is very strong (high) against the material of force and motion [17].

Lawrenz found that only 50% of prospective teachers answered the 11 questions correctly of the 31 questions tested [18]. Finegold states that student misconceptions are very much present in the material of Force [19].

Based on the background, the researchers took the initiative to reveal misconceptions that emerged in the students of the Department of Sport Education on concepts of sports biomechanics linear motion.

II. MATERIALS AND METHODS

This research is a descriptive qualitative research. The sample chooses using simple random sampling method [20]. It's used 30 students Physical Education Department year 2017/2018 Faculty of Sport Science, State University of Surabaya. The instrument used is a multiple choice Diagnostic Test equipped with the reason for the answer and Certainty of Response Index (CRI) scale. The number of questions tested is 10 questions including the concept of linear motion. The question of diagnostic tests used is a matter of standard mechanics developed by Chee [21], Suana [15], and Blazevich [22] to determine the misconceptions used in CRI scales developed by Hassan [23] completed with open reason in order to understand students' answer [24]. The answers of diagnostic test are categorized in the following four quadrants: (1) Know the concept, if the answer is correct and the CRI scale is high (3, 4, or 5), (2) Lucky Guess, if the answer is correct and the CRI scale is low (0.1 , or (2), (3) Lack of Knowledge, if the answer is wrong and the CRI scale is low (0.1, or 2), (4) misconception, if the answer is wrong and CRI scale is high (3.4, or 5)[23].

The analytical data were obtained from the diagnostic test to produce Correct CRI chart and Wrong CRI along with correct fraction of student's answer. The CRI is correctly obtained based on the average CRI value for the correct answer, whereas CRI is incorrectly obtained based on the average CRI value for the wrong answer. Correct answer a fraction of total is obtained based on the results for students who correctly answer the total number of students. Analysis of Diagnostic Test answers followed by categorization of student answers based on 4 categories. Non-parametric statistical analysis of t-tests was then performed to determine the level of misconceptions in students [25]. The paired t-test is performed after the assumption of sample normality is met. The diagnostic test data of misconception category through t-tested to get general conclusion of misconception rate that happened to student above 50%. Each misconception is assigned a value of 1 and other than the misconception category is given a value of 0, so the high value indicates high misconception and otherwise.

III. RESULTS AND DISCUSSIONS

From the previous studies, Suana [15], Tunc [16], Bayraktar [17], Lawrenz [18] and Finegold [19] shown that misconception emerge in prospective student and several concept, not exception in Physical Education students. In order to decrease number of misconception, first find out the number of misconception and how far its level in every single concept of sport biomechanics Linear Motion.

A. Curiosity of Response Index (CRI)

The results of the diagnostic test which consists of 10 questions covering several concepts in sports biomechanics linear motion are expressed in graphical form between correct CRI, wrong CRI, and correct answer fraction of total student obtained as follow:

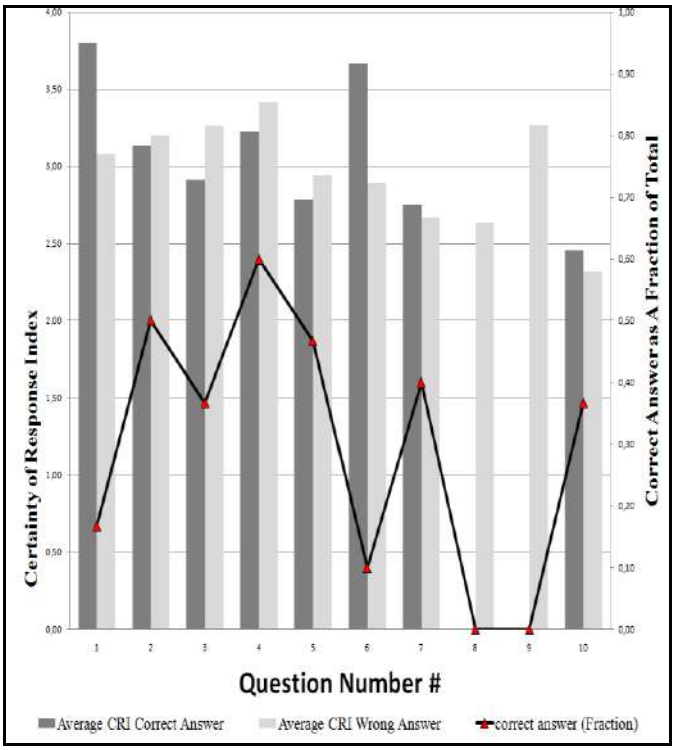

Fig. 2. Chart based on the results of 30 physical education students who took the diagnostic test. the bar graph shows the values of the average CRI for correct and wrong answers, for each question. Question numbers are shown on the horizontal axis.

Based on Figure 2, the CRI chart is correct, CRI is wrong, and the Correct Answer Fraction of Total shows that in the case of numbers 1 to 6 CRI is very high with a low true fraction (the number of students is very high) indicates that there are many misconceptions which occurred in the span of the problem. In problem 7 (the question of distance and displacement) and 8 (the question of speed and acceleration) shows the same thing that is wrong CRI is high and the true fraction is low even the absolute number 8 all students answer the wrong answer, it shows the existence of misconception on college student. In the case of numbers 9 and 10 (the question of free fall motion) also shows the existence of misconceptions even in question number 9, all students absolutely answer the wrong answer.

Based on the mapping of diagnostic test results 30 students also found the category in 4 quadrants with category of misconceptions, correct concepts, lucky guess, and lack of knowledge as follow:

TABLE I. RESULT DIAGNOSTIC TEST CATEGORIZED IN 4 CATEGORY

Categorize	Question Number									
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
misconception	20	14	17	11	11	22	11	17	25	7
correct concept	5	13	8	15	11	3	5	0	0	6
lucky guess	0	2	3	3	3	0	7	0	0	5
lack of knowledge	5	1	2	1	5	5	7	13	5	12

Based on the distribution of data in Table I it can be seen that the category of misconception are dominant in every aspect of test diagnostic tested. From data, the largest misconceptions students found in questions 1, 6, and 9 each more than equal to 20 students. The least number of misconceptions is found in question number 10 is 7 students.

B. *Analysis of Students' Open Reasons*

Students' answer completed with open reasons to understand way of thinking in every part of concept [24]. From this open reasons, researcher analyzed and took several misconception of linear motion that occurred.

1) *Distinguish Acceleration and Velocity*

First misconceptions arises about acceleration and velocity concept. It is analyzed from question number 7 of diagnostic test with screenshot as follow:

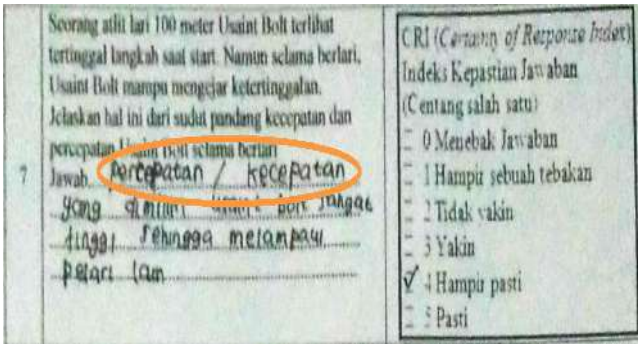

Fig. 3. Sample of student' answer question #7.

Based from Figure 3, student thinking that acceleration and velocity are same concept. Student couldn't distinguish both concepts. It is strengthened with high level number of CRI in that question. The conclusion that student couldn't distinguish both concepts also showed in figure 4 as follow:

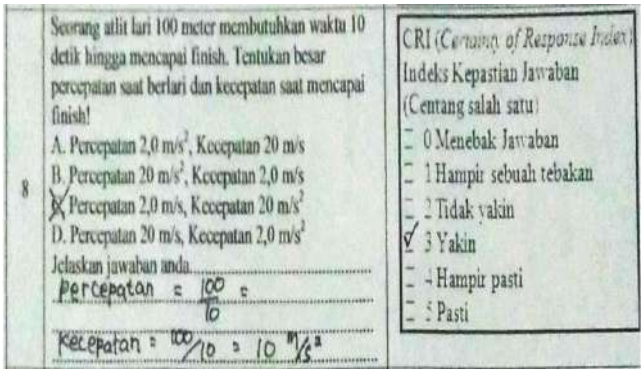

Fig. 4. Sample of student' answer question #8.

2) *Distinguish Distance and Displacement*

Second misconception arises about distance and displacement concept. It is analyzed from question number 10 of diagnostic test with screenshot as follow:

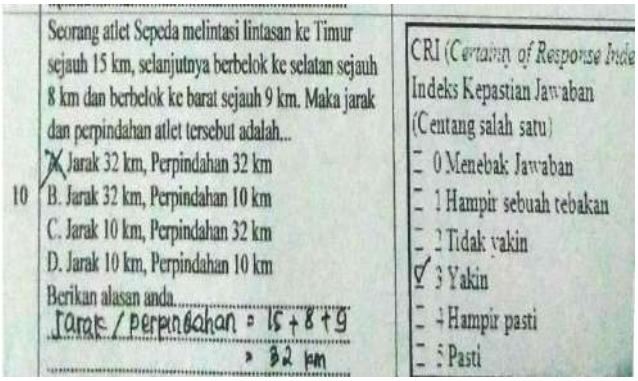

Fig. 5. Sample of student' answer question #10.

Student couldn't distinguished between both concept distance and displacement. Student considered that both of them is same concept. It is strengthened with high level number of CRI in that question number 10 in figure 5.

3) *Free Fall Motion*

Third misconception arises about free fall motion concept. It is analyzed from question number 9 of diagnostic test with screenshot as follow:

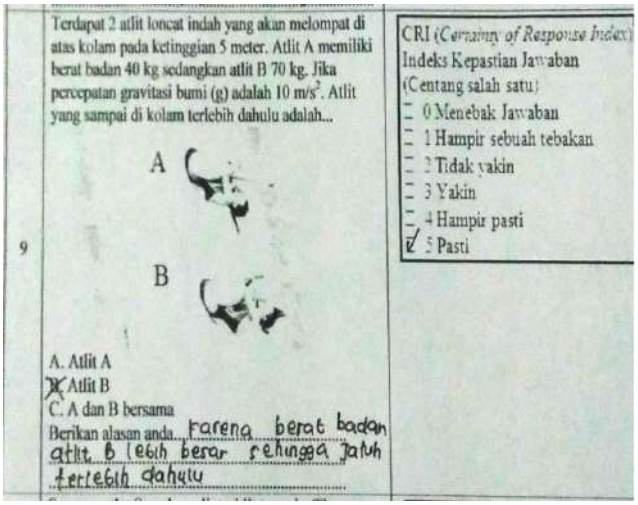

Fig. 6. Sample of student' answer question #9.

Based on the sample answer Figure 6, it could analyzed that student considered something bigger would falling down the stair first. The fact, in case of free fall motion quantity of mass doesn't influence time to fall [11].

Based on data spread of student misconception could be determined the percentage of 3 misconceptions that occurred in Linear Motion concept as follow:

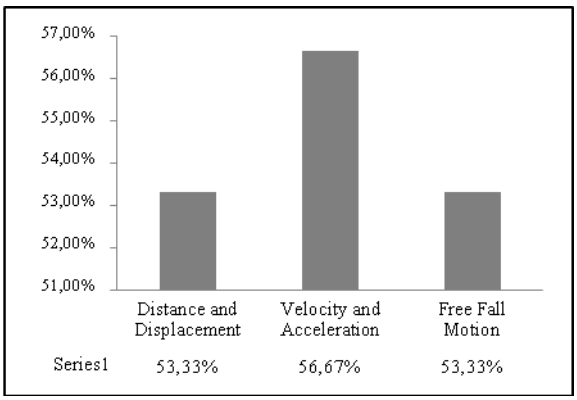

Fig. 7. Graph of percentage misconceptions in linear motion concept

Based on figure 7 it can be seen that there are quite high misconceptions in every category of sports biomechanics concepts tested. The highest misconception occurred on the concept of distance and displacement 53.33%, velocity and acceleration of 56.67% and followed by consecutive free fall motion concept of 53.33%. Generally, the percentage of misconceptions high enough indicates that there is still need for further individual improvement to overcome or reduce the misconceptions that occur in the students of sports teacher candidates in the field of sports biomechanics, especially linear motion concept.

Furthermore, based on the results of diagnostic tests mapped also misconceptions of each individual and then tested statistically parametric extent of the misconception that occurred in the classroom.

TABLE II. DISTRIBUTION MISCONCEPTIONS IN EACH STUDENT

Name	Misconceptions	Name	Misconceptions
A	5	P	7
B	6	Q	3
C	5	R	5
D	7	S	5
E	7	T	4
F	2	U	3
G	0	V	4
H	5	W	10
I	3	X	5
J	8	Y	5
K	6	Z	6
L	5	AA	7
M	4	AB	2
N	8	AC	7
O	8	AD	3

After passing the normality test and the data stated Normal then subsequent data based on the spread of misconception in each individual hypothesis test and obtained data t_{count} 0,042 $<t_{table}$ 1.699 so H_0 accepted that misconception that occurs in each student is above 50%.

Based on Figure 2 and Table 1, indicate that misconception arise in sport Biomechanics concept especially in linear motion. It's highly relevant to some of previous studies Suana [15], Tunc [16], Bayraktar [17], Lawrenz [18] and Finegold [19] also Kartiko [14]. In the study generally address the misconceptions that appear in each individual prospective teacher in their respective fields. The kind of misconception arise in linear motion concept based on Figure 3 until Figure 6 as evidences qualitatively that student of physical education cannot distinguish velocity and acceleration and consider both of them are same, distance and displacement, and the last considered that something bigger mass will be arrive first in free fall motion. By the emergence of misconceptions it is expected that there is a grand formulation of instructional design in sports majors, especially the right sport biomechanics course to reduce the consistency of misconception in order to produce an analyst in sport especially using sport biomechanics.

IV. CONCLUSIONS

Based on the results of the Diagnostic Test of Sport Biomechanics Linear Motion, the conclusion of misconceptions occurred in Physical Education Student with the percentage of distinguish concept distance and displacement 53.33%; distinguish concept of velocity and acceleration 56.67%; and the concept of free fall motion 53.33%. T-Test Result on Diagnostic Test of percentage of misconception category shows the percentage of misconception that happened in every student above 50%.

Subsequent research of these findings is expected to develop appropriate methods or models including grand formulation of instructional design to reduce misconceptions that appear in Physical Education students or at least analyze the determinants of the emergence of misconception in order to decrease the misconception in Sport Biomechanics.

ACKNOWLEDGMENT

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The Survey Level of Physical Fitness of Football Club of STKIP Taman Siswa Bima

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***Abstract*— The objective of this study is to know the level of Vo2max in football players. The type of this study was descriptive qualitative research. Sources of data in this study is to use primary data because the data is taken directly by researchers through Multistage Fitness Test. While secondary data is already available data so that can be obtained more easily and quickly, for example data name and number of football club players STKIP Taman Siswa Bima. The sample in this research was all football club players of STKIP Taman Siswa Bima which amounted to 22 people. Meanwhile, for knowing the endurance of football players, it can be used Vo2max test through Multistage Fitness Test. The result of physical fitness level in this footbal club player is with the average score of very good category of 155.5. The average score of the good category is 291.5, medium category is 283.8, low category is 239.7, and the total category is 1069.9. From the results of physical fitness test ability of average players football STKIP Taman Siswa Bima only has a vo2max 40-50, which means players far from the level of physical fitness of national foot ball players that Vo2max reached 60.**

Keywords—physical fitness level, football

I. INTRODUCTION

Sport is one of the ways to strengthen the development of a country, not only to build the physical but also it needs for sustainable development through the improvement of human resources (HR). Sport has instilled a physical education, and a good moral education towards each other, it can be seen directly through the match held by the government through local, National, and International championships.

This means that sport is very important for the development of human life which is strong and great. With the sport, state will be lifted the dignity, and the social status of athletes will be better in the fans' view and sports lovers, with the sports political lobbies will also be develop well for the progress of a nation.

Sport has a good scope in nowadays so that it undergoes significant changes to social, economic, cultural and political growth as part of the development of the Indonesian. In the recent development there are three sport scopes to filter the candidates of national athletes that we often hear, namely: 1). Education sport, 2). Recreation sport and, 3). Achievement sport.

These three sport scopes are important pillars for National Football development and it is same with the sport of football achievement. We all know that in the world cup soccer championship almost all the citizens of the world focused on one goal of the football game, either among the nobility and the people are all crazy about the grand event of world soccer.

Achievements in sport are not transformed instantly through a series of unclear tests, but sport performance coaching must go through a long series to acquire, and form the soul of the desired athlete, thus the athlete will have a spirit of fighting to decipher the red-white heritage in the International Championship. Because of the national sport as part of promoting / scent the name of Indonesia in the International arena through the brilliant achievement of athletes who are in the region to achieve the goal of achievement, so it is in line with the opinion of [19]. Sports achievement aims to foster and develop the achievement of athletes toward the high achievement. High achievement can be achieved through intensive training and programmed continuously and directed towards all elements of achievement that includes physical conditions, techniques, tactics and mental (psychic). These four elements are integrated into an ability and skill both in individual and a team sports.

Soccer is a sport played actively by over 240 million players besides having spectators whose number reaches billions [15]. When analyzed statistically, the game of soccer has gone through numerous changes over the years. This change caused by popularity and the competitive environments has made soccer a sport which requires more strength, power, endurance, speed, aggressiveness and talent. In turn, this has created the need to increase the performances of soccer players and determine in particular the physiological profiles of soccer players. It has been proven through scientific research that factors such as aerobic and anaerobic efforts, speed, agility, endurance and balance affect the performance dramatically and it is considered that only when the training depends on the physiological basics which affect these factors does the performance of the players increase [22].

Football has the most dominant energy system characteristic used is an anaerobic energy system because

many players do sprint many times to attack, seize the ball or run to secure their area. But with the length of the time it needs to be supported by the aerobic energy system. Aerobic energy systems require oxygen to be continuously channeled to muscle fibers as aerobic metabolism along with carbohydrates, fats and proteins to be converted by energy.

Soccer growth in popularity over the past 20 years has seen a similar increase for research conducted in all fields of sports science [17]. Soccer has developed at the elite, level much research regarding match performance and training has been conducted [14]. As soccer is a team sport, an efficient organization

Football is a sport that favored, and delighted so much by everybody both the old, young, male and even female. The soccer game shapes humans to be honest with themselves, sportsman fair, fair play, responsible and venture to take decisions. Nowadays the development of football in Indonesia is progressing very rapidly. It can be seen in various corners of the city as well as remote villages, it is very easy to find people who play footbal. Football is very popular in the community because it does not matter about the age, social status, or gender. Because it is not only men who play football right now even women like to play a football.

Football is a very popular soccer game played by two teams, each having eleven members [7]. The football game includes a big ball game. Football is played on grass field by two teams or two teams facing each other. The goal of the game of football is to enter the ball into the opponent's goal as much as possible and defend their own area from the opponent

The characteristics of the game is to play the ball using the foot or with all members of the body except by the arm. Football requires special fitness and strength. It is not a good thing if someone can play greatly in the first 10 minutes, after which he shows his fatigue! During a 1.5-hour football game, the players ran on average about 5 miles (8 kilometers) with partially run, and fast runs. This distance is not a short distance.

Based on the expert's explanation mentioned above it can be concluded that, soccer is a team game sport that demands quality tactics and techniques as well as a compact cooperation in one team to gain victory. As good as any techniques and tactics that a team has, without a compact cooperation will be difficult to win a game

To support game patterns that have good skills, basic techniques are required in the game of football. There are three types of football game techniques that should be taught to the players [16]. The variation terms used to mention these techniques, they are:

a. Foundation or basic techniques. Techniques are classified as foundation (base) is the most basic training menu or the lowest level.
b. Intermediate or advanced techniques. This technique is an advanced technique or intermediate level required to create relevance between the basic skills and the real playing skills.
c. Game or playing technique. The real football skills that every required by the players before they play against another team, actually.

To support the skills in football, physical fitness is required by the players, because physical fitness is the most important part in the human body, the following will be described the sense of physical fitness.

In general, physical fitness is physical vitality, that is, a person's ability to perform everyday work efficiently without excessive fatigue so that he can still enjoy his spare time [6].

Physical fitness is the ability to carry out everyday tasks diligently and vigilantly, without experiencing the most fatigue and can still enjoy his spare time and face the unexpected things in advance [11].

Physical fitness is also a state that is owned or achieved by someone in relation to the ability to perform physical activity, related to health when physical activity can be done without excessive fatigue." From the above definition can be concluded that physical vitality is a condition of the body with the remaining power capable of performing activities without causing fatigue effects [20].

A. Component of Physical Fitness

Components contained in physical fitness are:

a. Speed ;
b. Agility;
c. Coordination;
d. Endurance;
e. Balance
f. Flexibility
g. Strength;
h. Power
i. Reaction time [8];

B. Body composition

The entering of energy into the body in the form of energy must therefore be equal to the expenditure of energy, because energy can not be created or destroyed. The arrangement or use of energy includes (1) the external work performed by the skeletal muscle to move an external object or move the body in an external environment; (2) internal work. It consists of all other energy dependent activities that do not belong to the external workings of cardiac muscle and smooth muscle, glandular secretion, and protein synthesis. Only about 25% of the chemical energy in the food used to do internal work eventually appears as body heat. The metabolic rate, that is energy expenditure per unit time, is measured in kilocalories of heat produced/hour [5].

Good physical fitness will form a good achievement, if physical fitness is owned by the athlete capable of being supplied by the energy that is done at the time of the sport it will form a very powerful force, thus physical fitness can not be separated from the entry of proper energy to produce efficient motion in physical exercise activity.

From the explanation above can be concluded that physical fitness is the capability and ability of the body to make adjustments or adaptation to physical loading without causing excessive fatigue. The level of physical fitness possessed, can be seen from the ability in physical activity. People who have better physical fitness can carry out their physical, daily, efficient, effective, and

productive activities without experiencing significant fatigue.

To know the capacity of physical fitness, so one that is measured in sports is Vo2max, thenit will be described the explanation about Vo2max

Vo2max is the speed of oxygen consumption in maximum aerobic metabolism. In State Minister of Youth and Sports Affairs 2005 Vo2max test can be done by using bleep test, it can improve cardiovascular one's physical fitness [8].

According to some experts there are several tests conducted in the Vo2max test which includes the following:

Determination of predicted value of Vo2max by BMI measurement was done using equation by involving age factor, BMI, and SRPA [4]. Predictions on the skinfold method were performed by summing the skin thickness of the triceps, *suprailiaca*, and *abdominal* areas measured using *skinfold calliper* [9]. This amount of the skin fold is used as an input to calculate the percentage of predicted value of Vo2max from body fat percentage

The method of Astrand bike uses a submaximal test in which the subject rides a static bike for a minimum of six minutes with certain loading and in stages [4,21]. It proposes that the *treadmill* test uses the *Balke* protocol. VO2max is calculated from the speeding time equation on the running track. In the *Hardvard Step Test*, respondents climbed the bench up and down as high as ± 17 inch for a maximum of 5 minutes, then calculated *physical fitness index* (PFI).

Physical activity is measured using the *short form of International PhysicalActivity Questionnaire* (IPAQ). Determination of activity level is based on the volume of activity within a certain period of time over the past seven days in METs-minute units (IPAQ Research Committee, 2005). Some statistical tests include *Krusskall-Wallis* test, *Spearman* test, and *Friedman* test used to analyze correlation of BMI factor, gender, and physical activity to the value of Vo2max.

Sharkey is to live a healthy life someone must undergo 7 habits of life, namely:

1. Sport regularly
2. Sleep enough
3. Good breakfast
4. Eat regularly
5. Control weight
6. Free from cigarettes and drugs
7. Not consume alcohol [18].

Maximum oxygen volume is the maximum amount of oxygen obtained by the body when the maximal exertion in exercise, when the body converts food into energy, the greater oxygen consumed the greater the energy or speed produced.

The result of Vo2max level criteria measurement test on Lumajang Football Association member member with 22 subjects studied, the result has average 47,47 ml / kgBB / minute with good criteria. For good criteria amounted to 3 people with a percentage of 13.64%, then for the level of vo2max with good category amounted to 8 people with a percentage of 36.36%, while for the level of Vo2max with moderate category amounted to 11 people with a percentage of 50% [3].

From the results of research in the school SMK Negeri 1 City Gorontalo athletes soccer students are known that the endurance of cardiovascular athletes berkatagori very less with 100% percentage, from 23 students athletes football student SMK Negeri 1 city Gorontalo by doing bleep test they can only arrive at the maximum level at the 8th level to 6th (41.8), the lowest one at the 2nd level to 7 (22.1) [13].

There are several factors that affect the practice and the it's result, if the whole exercise session is done seriously then it does not require the possibility of getting the best results in the following games. On the contrary when all the practice sessions are not seriously done by the players, then the results obtained are not maximal. The basic factor that a football player needs to have is physical fitness, to form a physical that produces skilled energy in playing the ball.

The problem of physical fitness is one that affects the football playerskills of STKIP Taman Siswa Bima, so the players are often not able to balance the physical quality which impact on the seizure of the ball is often won by the opponent team. This is an urgent problem experienced by every team, including the football team of STKIP Taman Siswa Bima in the very youngest age.

Physical fitness in football STKIP Taman Siswa Bima is one that is encouraged to coaching gradually, so that physical fitness is expected to survive on long durations of time, because the game of soccer must provide a good physical.

The urgent factor in the player's field is the physical, physical problems of the players often experience fatigue when sparing with other teams, resulting in an uncontrollable impact when battling the ball with opposing players. Physical is the basic foundation to form peformance of football players.

Seeing this as a coach as well as a coach to maneuver an exercise program that leads to physical improvement, the doses in the exercise continue to be improved in the process of training sessions, so players are no longer physically exhausted in any given exercise. One of the programs to improve the physical players is the Multistage Fitness Test (MFT Bleep) test.

The maximum energy use through an aerobic system that requires oxygen is limited by the maximum speed of the cardiovascular respiratory system in sending oxygen to the muscles, so football players need to have a good Vo2max to supply oxygen to support their activities during the game. Therefore, before determining the training program that will be given, of course, it must be done by a pre-test in advance for the sake of the program to be given and executed exactly in accordance with the conditions of team members. One of the testsis to find out how far the level of Vo2max can be done by performing a Multistage Fitness Test (MFT Bleep). Regarding the consideration in improving the player's physical ability, the researcher wants to conduct a research entitled "Survey of Physical Vitality Level at STKIP Taman Siswa Bima Footbal Club".

Exercise has a good scope in nowadays so that it undergoes significant changes to social, economic, cultural and political growth as part of the development of the Indonesian nation. In the development of sports there

are three sports scope to filter soccer skills, namely: 1). Education sport, 2). Recreation sport and, 3). Achievement sport. The following will be described in the Sports System Act No. 3 of 2005 Article 18-20. Education sport is organized as the part of the educational process. Recreation sport is done as part of the process of restoring health and fitness. Achievement sport is intended part of the efforts to improve the ability and potential of athletes in order to improve the prestige and dignity of the nation.

Thus the students and lecturers are able to think and work innovatively throughout their life, remembering the challenges in the modern era in nowadays is the advancement of science, technology and human resources of high quality in developed countries. Along with these advances, the college STKIP Taman Siswa Bima responded it well to compete and build achievement through skillful activities in sports achievement both local, national, and not demanding possibilities to the international world.

This responsive attitude makes lecturers at the college of STKIP Taman Siswa Bima to be positive to improve the quality. To realize the quality of quality not only sit on the bench and then teach students in classrooms. However, the culture of quality improvement must be in harmony with the innovation of work through real activity that is one of them is through achievement sport, because the sport of achievement as one to find the identity as well as raise the prestige and the dignity of the college.

The basis of the formation of this club is an integral part of the process of establishing the quality of human resources (HR) students of STKIP Taman Siswa Bima who can compete through achievement sport. Achievement sport is a sport to find the ability and identity as sports enthusiasts. Because the sport needs to be spread in three pillars in the Act of Sports System that are education sport, recreation sport, and achievements sport.

These three basic pillars are absolutely implemented and done by the national athletes, and then supported by the motto of sporting the community and community the sport across the layers of Indonesian society, while the foundations of the formation of this club will be described as follows.

The act enables motivation for the college of STKIP Taman Siswa to facilitate the channeling of soccer talent. Seeing the various developments of the existing sports college, so in 2016, a football club is formed as a place for sports distribution, so early formation of strategic steps to organize instruments recruiting soccer players freely, through physical tests and skills followed in the selection phase. From this stage, it is selected and determined about 22 players who were selected to enter the soccer team of students who joined the selection.

The existence of the football club STKIP Taman Siswa Bima increases through the participation rate at the 2016 Regent Cup tournament. Each Club has a target to get the championship, the target is not excessive, because the sport of achievement is a sport to get champions through positive channels that uphold values of sportsmanlike. Uncertain competitions are the duty and responsibility of the coach / elder in fostering his athletes to be viable, and eager in training, as well as in competition. So from the participation in the competition, football club of STKIP Taman Siswa Bima has not been able to enter the runner-up round.

II. MATERIALS AND METHOD

Qualitative data is a source of broad and well-defined descriptive, and contains an explanation of the processes occurring within a narrow range. With qualitative data we can follow and sequence events chronologically, assess cause and effect within the sphere of the minds of the local people, and obtain a rich and useful explanation.

The design of the descriptions research is essentially aimed at providing descriptions with a view to answering research questions.

The type of this research is descriptive qualitative research, to obtain the facts from the existing symptoms, the researcher used the test and measurement. Descriptive is a type of research that provides an overview or description of situation as clarity as possible without any treatment of the object under the study. Surveys are one type of research to find out the opinions of information obtained ofthe study, it can be collected from the entire population and can also be from some of the population.

Source of data in this study is to use primary data because the data is taken directly by the researcher through Multistage Fitness Test (MFT bleep) While secondary data is already available data so that can be obtained more easily and quickly, for example data name and number of football club players of STKIP Taman Siswa Bima.

The sample in this research is all football club players of STKIP Taman Siswa Bima totally 22 people. For the sake of knowing the endurance of soccer players can be used Vo2max test through *Multistage Fitness Test (Mft Bleep).*

To prove the accuracy of the data in this study, it will be used the test technique (Dany and Arikunto, 2012). MFT goal to measure maximal work of heart and lungs with prediction of VO2Max, test bleep. Which cover:

a. The researcher explained about the procedure of doing MFT bleep test
b. The sample is warming up
c. Distance 20 meters
d. Width of 1 meter per trajectory
e. MFT test stage bleep
   - Stand behind the starting line
   - Waiting for instruction from playback of MFT bleep test tape
   - Do a run with a distance of 20 meters
   - Students are not allowed out of the track
   - Students should not interfere with other runners
   - Assessment of students to run from point 0-20 meters, at first level, and back and forth the first student to run. And so on until the sample is no longer able to continue to run at the next level.

Data analysis in this study is data in the form of quantitative descriptive, which means analyzing the findings in the field about the physical condition of physical fitness through the test Mft bleep football player STKIP Taman Siswa Bima

III. RESULTS AND DISCUSSION

After doing the research then the next process is to describe the results of research on football players of STKIP Taman Siswa Bima as explained below:

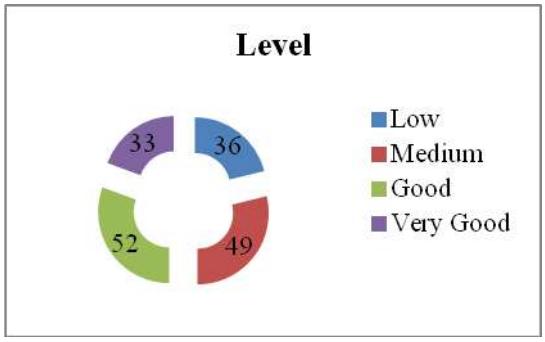

Fig 1. The graphic of soccer playersare based on the level.

The level graphic above shows that the highest student ability for vo2max is at level 11, and at the lowest level is 6. In the very good level soccer players can only complete a physical fitness level test at level 11 of 3 people with an average of 33. In the good level the soccer player is only able to complete the physical fitness level test at level 9 of 6 people with the average of 52. At a medium level soccer players are only able to complete a physical fitness level test at level 7 of 7 people with the average of 49. In the low level soccer players can only complete a physical fitness level test at level 6 of 6 people with an average of 36.

In the next discussion will be discussed about the ability back and forth with MFT Bleep test on football players of STKIP Taman Siswa Bima, as described in the following graphic:

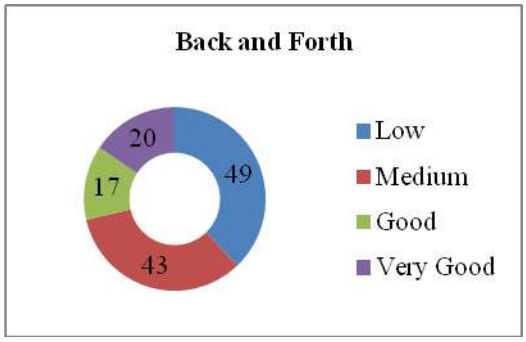

Fig 2. The graphic of soccer players based on the level.

From the graphic above, it shows that the back and forth results of the research using MFT Bleep test through football players of STKIP Taman Siswa Bima are:

1. On the back and forth of the very good category is to get an average score of 20 with the number of 3 players.
2. On the back and forthof good categoryit gets an average score of 17 with the number of 6 players.
3. On the back and forth of the medium category is getting an average score of 43 with the number of 3 players.
4. On the back and forth of the low category get an average score of 49 with the number of 6 players.

To find out vo2max of soccer player of STKIP Taman Siswa Bima as shown in the following graphic:

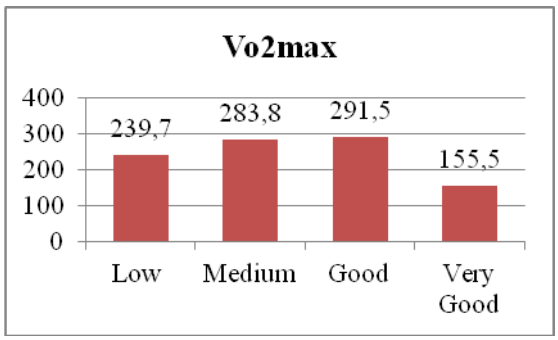

Fig 3. The graphic of soccer players based on vo2max.

From the Vo2max measurement graphic of soccer player of STKIP Taman Siswa Bima above shows the results with the average value of each group, then the average in a very good category are amounted to 155.5. The average value of each groups in good category, the the average are amounted to 291.5. The average value of each groups in medium category, then the average are amounted to 283.8. The average value of each groups in the low category, then the average are amounted to 239.7.

Measurement of the results in this study of the physical fitness level of soccer players of STKIP Taman Bima use Multistage Fitness Test (bleep test). So in the results of this study conducted measurements of 22 players experienced different vo2maxin each player, and the average value of the overall subject is 970.5.

From the results of physical fitness level test of football player of STKIP Taman Siswa Bima the average only has Vo2max 40-50, it means that player is far from the fitness level of the national soccer player that is Vo2max 60. This will affect the performance of the players when competing with other players. Totality, physical endurance can get tired easily with the duration of football game which its intensity is aerobic and anaerobic

IV. CONCLUSION

From the discussion of physical fitness level of STKIP football player Taman Siswa Bima with MFT Bleep test above, it can be concluded as follows:

1. On the number of soccer players of STKIP Taman Siswa Bima which amounted to 22 people then obtained the average value of vo2max totally 970,5. The average of the very good category is 155.5. The average of the good category is 291.5. The average of the medium category is 283.8. The average of the low category is 239.7.
2. From the results of physical fitness ability test, the average of players only have a vo2max 40-50, it means that players are far away from the level of physical fitness of national football players that their Vo2max reached 60.

3. This research can be used as a reference by the trainer or coach to improve the physical condition of the football player, by increasing the dose of exercises.

On the MFT Bleep test is devoted to improve physical conditions, especially in football sport that require long physical endurance, so it will encourage skillful ability in the football game.

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Empowerement of Trained Health Volunteers to Increase Detection Rate of Children with Developmental Delay in Urban Kendal, Indonesia

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***Abstract*—Early detection at integrated health post in Kendal is only in growth aspect. Health workers and volunteers never measure and monitor developmental aspect among children. This makes developmental delay among them cannot be early detected and treated. Trained health volunteers (HV) are HV who are trained in children development measurements based on Pre-Screening Development Questionnaire (KPSP) and regularly monitor children. The aim was to know the effect of trained HV on HV's knowledge and attitude about children development, and incidence rate of children with developmental delay detected. It was quasi experiment with pretest posttest control group design. Monitoring was conducted by HV once a month for 3 months in Pegulon and Patukangan Villages as experimental groups and Bandengan and Ketapang Villages as control groups. Collected data were analyzed with t-test. Knowledge posttest score among trained and untrained HV respectively was 74.2+5.07 and 67.9+4.37, while attitude was 80.9+4.53 and 71.0+4.48. There was difference of knowledge and attitude on children development between trained and untrained HV (p<0.001). Incidence rate of children with developmental delay detected by trained HV was 18 suspects per 1000 children-months. Trained HV was proven to increase detection rate of children with developmental delay in urban area.**

Keywords— trained HV, developmental delay, detection

I. INTRODUCTION

Children have a characteristic that always grows and develops from the time of conception until the end of adolescence [1]. Growth is different from development. Growth is an increase in the size and number of cells and intracellular tissues, so that it can be interpreted as increasing the physical size and structure of the body partly or completely [2]. Growth is quantitative so it can be measured using units of length and weight. The development is the addition of the ability of the structure and function of the body more complex, so that the measurement is much more difficult than growth [3, 4].

Children's growth and development from the mother's womb until age 6 years will determine the degree of health, intelligence, emotional and spiritual maturity, and productivity at the next level [5]. The development of speech and language, intelligence, social awareness, moral, and emotional work quickly in infancy and become the foundation for further development. Even the slightest deviation if not detected, not handled properly will reduce the quality of human resources in the future [4]. The Government of Indonesia has efforts to overcome the problem of growth and development in the form of stimulation, detection, and intervention programs of growth and development, but its implementation is not optimal and still not well monitored.

The implementation of the program in primary health care in Semarang was still limited because it has not been socialized properly and correctly, inadequate supporting facilities, and lack of support from primary health care. This made the final goal of the program has not been achieved as expected. Programs implemented was only early detection of growth delay, whereas early detection of developmental delay, emotional mental disorders, and age-appropriate stimulation have not been implemented [6].

Early detection of child's growth and development is an activity to determine early growth and developmental delay/deviation among infants and preschoolers. Aspects seen from this early detection is the aspect of growth and development. The growth aspect relates to body weight, height, and head circumference of child. The developmental aspects associated with gross and fine motor skills, language, and social [7]. With early detection of child developmental problems, interventions are easier to perform, health workers also have time in appropriate interventions. If the deviation is

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late known, then the intervention will be more difficult and affect the child's growth and development [4].

Early detection at integrated health post in Kendal is only in growth aspect. Health workers and volunteers never measure and monitor developmental aspect among children. This makes developmental delay among them cannot be early detected and treated. Children in Urban Kendal who did not receive exclusive breastfeeding and early initiation of breastfeeding and experienced developmental was 60.8%, while 8.7% of children who received both experienced developmental delay [8].

One of the main activities at integrated health post is to measure growth and development regularly. The types of services provided by integrated health post for children under five are: 1) weight weighing, 2) determination of growth status, 3) health promotion and counseling, 4) medical examination, immunization and early detection of growth and development. If found abnormalities, immediately referred to primary health care [4].

Integrated health post activities in Kendal that have been running regularly every month should be the right opportunity to be utilized in optimizing the measurement of children development. Measurement of development is an activity that should be done routinely every 3 months from 3 months to 72 months to monitor and detect early chances of developmental delay. There is no activity in Table 2 of integrated health post that is supposed to be a place of growth and development measurement for mother and children. During this time, the integrated health post activities are still very simple, by just measuring the baby's weight and recording the results on the card and register book. The absence of measurement of children development is due to the health volunteers not having enough knowledge and ability to do. In addition, unavailability of instruments and equipment required in measuring children development is also a cause.

Trained health volunteers (HV) are HV who are trained in children development measurements based on Pre-Screening Development Questionnaire and regularly monitor children. The aim of this study was to know the effect of trained HV on HV's knowledge and attitude about children development, and incidence rate of children with developmental delay detected.

II. MATERIALS AND METHODS

This study was quasi experiment with pretest posttest control group design. Experiment group consisted of 30 HV in Pegulon and Patukangan who were trained in child development measurements based on a Pre-Screening Development Questionnaire and regularly monitored child development. The control group were 30 HV in Ketapang and Bandengan who were not trained.

Both groups were measured knowledge and attitude before and after intervention. After training, trained HV monitor children development for 3 months. Incidence rate of children with developmental delay detected by HV was calculated. Knowledge and attitude data were analyzed by t-test.

III. RESULTS AND DISCUSSION

Characteristics of trained and untrained HV on the educational and employment aspects were not much different. Most educational levels for trained and untrained HV were junior high school (55.6% and 44.4%). At employment, most of the employement of trained and untrained HV were entrepreneurs (44.1% and 55.9%). Characteristics of education and employment of HV can be seen in the following table.

TABLE I. HV CHARACTERISTICS BASED ON EDUCATION AND EMPLOYMENT

Variable	Trained		Untrained		Total	
	n	*%*	*n*	*%*	*n*	*%*
Education						
- Elementary school	4	44.4	5	55.6	9	100
- Junior high school	15	55.6	12	44.4	27	100
- Senior high school	9	47.4	10	52.6	19	100
- College	2	40.0	3	60.0	5	100
Employment						
- Housewife	13	59.1	9	40.9	22	100
- Entrepreneneur	15	44.1	19	55.9	34	100
- Civil servant	2	50.0	2	50.0	4	100

Knowledge and attitude score of trained HV before and after training showed a difference (p <0.001). Knowledge pretest score was 69.0±3.98 increased to 74.2±5.07 after training. As well as in the attitude aspect, it increased from 72.1±3.72 to 80.9±45.3. Unlike untrained HV, knowledge and attitude score did not differ significantly. Knowledge pretest and posttest scores were 67.9±4.38 and 67.9±4.37, so there was no significantly difference (p: 0.54). As in the attitude aspect, although there was an increase from 70.9±4.18 to 71.0±4.48, it did not differ significantly (p: 0.42). Table 2 shows different test results on the knowledge and attitude aspects among trained and untrained HV.

TABLE II. KNOWLEDGE AND ATTITUDE SCORE AMONG TRAINED AND UNTRAINED HV

Group	Variable	Test	Mean±SD	p-value
Trained	Knowledge	Pre	69.0±3.98	<0.001
		Post	74.2±5.07	
	Attitude	Pre	72.1±3.72	<0.001
		Post	80.9±4.53	
Untrained	Knowledge	Pre	67.9±4.38	0.54
		Post	67.9±4.37	
	Attitude	Pre	70.9±4.18	0.42
		Post	71.0±4.48	

TABLE III. KNOWLEDGE AND ATTITUDE (POSTTEST-PRETEST) SCORE BETWEEN TRAINED AND UNTRAINED HV

Variable	Group	Mean±SD	p-value
Knowledge (post-pre)	Trained	5.6±4.47	<0.001
	Untrained	0.27±0.52	
Attitude (post-pre)	Trained	8.83±3.36	<0.001
	Untrained	0.37±0.56	

Table 3 shows the differences of knowledge and attitudes between trained and untrained HV. Difference between pretest and posttest of each group is used as comparison. The results

showed that there was a difference of knowledge and attitude on children development between trained and untrained HV ($p < 0.001$).

Of the 30 trained HV, there were 23 HV (76.7%) periodically monitored children development aged 3 months - 5 years 11 months for 3 months in their area. In contrast, all untrained HV did not monitor children development.

Children measured by trained HV were 57 children and 3 children of whom were children with developmental delay. It can be concluded that the incidence proportion of children with developmental delay in urban Kendal was 5%, while incidence rate of children with developmental delay detected by trained HV was 18 suspects per 1000 children-months.

Growth and development are influenced by several factors, one of which is health care. Regular health care is not only when the child is sick, but health screening and early detection of growth and development are necessary to be done routinely, so that support children growth and development [9]. One of the efforts to develop children under five development which has been implemented by the Ministry of Health of Indonesia is early detection and stimulation of children growth and development in basic service level. This effort aims to find out early on the existence of growth and development deviances among children. This effort is carried out in integrated health post as a routine activity to help children achieve optimal growth and development, then they become qualified, healthy, intelligent, creative, and productive human beings [10].

Children who receive responsive stimulation will have higher cognitive, linguistic and motoric abilities than those who are not stimulated [11]. In other countries such as Cuba there are repeat visits to the home by physicians in the year after the baby is born which promotes optimal nutrition and early childhood development [12].

HV are the groups that most often interact with the community, then they have a very strategic position and an effective means of communicating messages related to health problems either in integrated health post or in the surrounding environment. Therefore, they need good knowledge to motivate people to prevent and detect developmental delays. The role of HV is to take responsibility, develop capabilities, become actors and pioneers as well as leaders who mobilize communities based on the principle of independence and togetherness [13]. In some countries, such as Ethiopia, Niger and Mali, HV (known as the Health Development Army in Ethiophia and Relais Communautaire in Mali and Niger) play an important role in promoting keys of healthy family including breastfeeding, infant care, hygiene and sanitation [14].

The role of HV in integrated health post in every village is very important in monitoring the growth and development of early childhood. HV in integrated health post can observe children development every month so as to provide appropriate stimulation for children who come. In some countries, basic services provided include early childhood development. In Pakistan, there are "Lady Health Workers" who do home visit services covering mother counseling practices in child-responsive stimulation [15]. Lack of functioning of integrated health post is due to the ability of HV is still low, including knowledge and skill [16].

Limited knowledge of HV to understand their duties to assess children development can be attributed to very limited coaching and mentoring mainly from primary health care workers or from health offices. Training is one of the methods to increase the knowledge. Someone who has received training, then his knowledge and skills will improve. Providing information submitted through the training process may replace previously acquired knowledge and as a refinement of prior information [16].

Attitudes were influenced by the evaluative processes undertaken by individuals, influenced by genetic factors, personal experiences, parental influences, peer groups that influence individuals and the mass media. In the process of education or training, an attitude was not necessarily manifest in practice or action. It was still needed certain conditions that allow the change of attitude into practice. These conditions included the availability of facilities for learning in which participants are given the opportunity to see and hear other people performed these skills and given the opportunity to do their own. HV who initially do not understand, after getting child development training, can slowly learn and implement stimulation for children [8].

HV as the motor of public health should be a reliable communicator in spreading information to the public. The level of HV practice is supported by higher-capacity HV who have received education, longer training experience, have salary, and have backgrounds in health improvement efforts [17].

On early detection of development, HV need support or role of existing health workers to provide guidance if they meet difficulty. A health worker is a person who possesses knowledge and skills through health education. In the integrated health post activities, health worker is tasked with carrying out medical assessment and following up on HV's findings. Support from health workers is to provide guidance to HV during or after integrated health post activities in the form of recording and how to improve the ability of HV in early detection of child's growth and development [10].

IV. CONCLUSION

There was difference of knowledge and attitude on children development between trained and untrained HV. Incidence rate of children with developmental delay detected by trained HV was 18 suspects per 1000 children-months. Trained HV was proven to increase detection rate of children with developmental delay in urban area

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Developing a Long Passing Skill Measuring Instrument For Soccer School Student

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Abstract—This study aims to produce a long passing skill measuring instrument of soccer school student. This study applied research and development method by using experimental design with the steps; (a) draft development, (b) validation, (c) small group experiment, (d) large group experiment. The small group experiment is done three times, while the large group experiment consisting of 150 students from 8 soccer schools is only done once. Based on factorial analysis result (validity test) and test and re-test technique (reliability test), it is obtained that long passing skill measuring instrument is valid and reliable. The researcher develops a long passing skill measuring instrument for soccer school students in Medan.

Keywords— Long passing, measuring instrument Introduction

I. INTRODUCTION

In Indonesia, soccer becomes the most favorite sport for all ages, especially for children. Burgess and Gabbett (2013) stated that soccer can be considered as the most played sport in the world[4]. As proven in the World Championship held once per four years, it attracts more viewers rather than an Olympiad.

Conventionally, the majority of soccer players have been familiar with facts that soccer consists of four components; technique, tactics, physic, and mental (Danurwindo, et al., 2017:56)[6]. As Su'udi (2010:5) suggests that neither victory nor defeat is determined by inattention of one or two players, it indicates that soccer has to be played within a teamwork and good skill[23]. Individual skill is one thing to consider in a game. However, a good skill cannot be easily obtained as Su'udi (2010:6) claimed that individual skill of a great soccer player is obtained through a hard work, not an instinct way[23]. One of the skills that every player must have is long passing. Long passing can be very effective because defender players do not keep their rival much. Accuracy to do passing is essential since every single fault will be watched (DK, 2011:78).

Players' skill will increase gradually within coaching process, especially basic skill in doing long passing. In order to observe the improvement, it is necessary to do an evaluation of which also needs a measuring instrument to evaluate the practice result. Correspondingly, Purwanto (2014:1) revealed that a particular program has a certain goal and to know whether or not the program achieves the goal, it requires an evaluation[20]. Therefore, long passing skill taught to the students has to be evaluated. Decision making of evaluation is conducted based on the measurement result and the criteria (Purwanto, 2014:2)[20]. Skill in planning, doing a measurement activity and using information obtained from activity to make an accurate evaluation is necessary due to the success of the activity you choose. (Lacy, 2011:1).[17]

Previous studies on the written work of such topic have been conducted by some researcher. Vieira, Vitor, Rodrigo (2017) reviewed that five tests prove sensible construct validity that can be applied to predict accuracy (penalty kick, free kick, rolling ball kick, corner kick[24]. Cripps, Hopper, and Joyce (2015) showed that kicking skill and hand ball has a strong validity and reliability[5].

A. Long Passing

Knap, as cited in Ali (2011)[1], defined classic skill as skill to get results with high accuracy by energy expense and minimum time expense. The simplest skill in soccer is so-called as basic skills and one of those that a soccer player should have is long passing skill. A certain situation within soccer game sometimes asks players to give a ball to another player with further distance. Thus, it requires players to do long passing. Long passing is a technique that is rarely taught by coaches. Distance, accuracy, penetration, especially to the player who is ready to receive the ball and skill to change an attack point quickly and accurately are requirements in a modern game (Martin, 2011: 39)[19].

To do passing in the field with further distance, one has to bounce the ball by using shoes back part, not shoes inside part (Mielke, 2007:22). There are several things to consider to do long passing; (a) kick the ball at low position to carry more force, (b) tilt the body back when touching the ball, (c) firmly place the foot as a pedestal slightly in front of the ball with slightly sideways, (d) strecth out the hand to get the balance (Mielke, 2007: 22). Mistakes in doing a long passing accurately is still found and it has to be changed (DK, 2011: 79).

Ideally, students' skill at coaching program in a soccer school increase including the basic skill of long passing. A particular program has a certain goal and to know whether or not the program achieves the goal, it requires an evaluation (Purwanto, 2014:1)[20]. Skill in planning, doing a measurement activity and using information obtained from activity to make an accurate evaluation is necessary due to the success of the activity you choose. (Lacy, 2011:1)[17]

Evaluation is a systematic and sustainable process in collecting, describing, interpreting, and providing information about a certain program as a base to make desicions, to

establish policies, and arrange following programs (Widoyoko, 2012:6)[26].

Evaluation and measurement are mutually and constantly interconnected. Evaluation is conducted once measurement is done and evaluation decision is carried out based on the measurement result (Purwanto, 2014:1)[20]. Lacy (2011:5) defined measurement as a technique needed to do an evaluation[17]. A measurement represents an attribute status or a certain property underlying a terminal process. Verduci in Widiastuti (2011:2) believed that measurement is beneficial for determining information about an object correctly[25]. A measurement must be correct, reliable, subjective and the result must be presented in numeric form denoting a number of property or attribute being measured (Lacy, 2011:4)[17].

According to Erlangga football trainer (2017:128)[9], once the seasonal training is over, it is significant to do assessment toward students' development on the guidance being taught. Furthermore, Widiastuti (2011,5) asserted that measurements applied in sport or sport education are based on several notions: (1) goals which are supposed to be measured corresponding with the extent to which the goal are achieved, (2) scientific point of view that is closely related to sport development itself, (3) sport values cannot be found before measurement is conducted, (4) benefits or advantages to develop the program, (5) professionalism (trained and experienced)[25].

B. The Principle of Measurement

The are some principles which determine evaluation success according to Fenanlampir and Faruq (2009:9): (1) being aligned to the education philosophy, (2) being done based on the goal, (3) positioning testing as one of the parts of measurement and measurement as one of the parts of evaluation, (4) interpreting testing result in individual development context including physical, intelectual, emotional, social, and moral aspects comprehensively, (5) referencing to the notion that all one's attributes can be tested and measured. (6) discovering the early skill which is then compered to the test result. (7) using valid and reliable measuring instrument or test due to its influence toward the evaluation result[10].

A measurement which only aims to get data or informations is just wasting time, energy, and expense. The benefit and the use of measurement as stated by Lacy (2011:5-8) is for diagnosis, classification, presentation, repair, motivation, evaluation, program, human relationship, and forecast[17]. Widiastuti (2011:5-8) also affirmed that the use of test and measurement is to determine status, clarification, diagnosis, guidance, motivation, teaching development, teacher/coach assessment, method, and material[25].

A teacher or coach is required to choose a good measuring instrument to obtain a good coaching decision as well. Therefore, a measurement or test must fulfill particular conditions. There are five conditions of a good test proposed by Arikunto (2013:72); valid, reliable, objective, practical, and economical. While according to Purwanto (2014: 153) the conditions of a good learning outcome measurement are validity and reliability[20].

Once the data is obtained from a valid instrument, it can be assured that the instrument is valid because it provides a potrayal description about the data based on real situation as well (Arikunto, 2013: 73). Azwar (2016: 8)[2] suggested that validity is to what extent a test accuracy or scale in running its measuring function. A measuring instrument is not only able to reveal data as well but also to provide careful descriptions regarding to the data (Widiastuti, 2011: 9)[25].

Reliability is closely related to consistency, stability, and dependability (Usman and Setiyadi, 2009: 287). Reliability is a measurement set which has consistency when the measurement is conducted using the exist measuring instrument continously (Sugiyono, 2009: 137). Although reliability has some different terms, such as consistency, stability, and dependability, but the main idea underlying the concept of reliability is to what extent the measurement result can be trusted (Azwar, 2016:7)[2]

Based on the the principal, goal, benefit, and conditions of the measurement above, a coach has to conduct a test or measurement. By conducting a test or measurement, a coach can have accurate data to do an evaluation on his/her students. Thus, the evaluation or assessment result obtained can be a guidance or base to take a next step(s). The previous studies showed that coaches in soccer school in Medan do not have a sufficient evaluation instrument. The evaluation result is only taken from observation. Whereas, evaluation done only by observation is carries a lot of weaknesses, one of which is subjectivity. Nicholls and Worsfold (2016) reported that bad observation accuracy level from six elite coaches in doing evaluation toward ten young soccer players in eight competitions through observation brings a significant implication in talent identification assessment. This finding encourages the importance of performance analysis to provide an accurate and comprehensive additional back pass in a coaching process. Therefore, the researcher is interested to develop a long passing skill measurement model for soccer schools students aged 14-15.

II. MATERIALS AND METHODS

This research focused on the development of soccer skill measuring instrument for soccer school students. The method employed was research and development (RnD). Research and Development is a type of research used to produce a particular product and to test the effectiveness of the product itself (Sugiyono, 2014: 297). Procedures applied in this research were:

1. The preliminary study phase includes; (a) literature study (b) data analysis of preliminary study result and descriptions of field data finding, and (c) preparation of initial product design of measuring instrument to be developed.
2. The developmental stage; the draft was distributed to the experts to be corrected and subsequently revised. To gain the result of the revision draft, Focus Group Discussion (FGD) was conducted which involved the experts, the draft

revised and the design of measuring instrument to be tested.

3. The phase of measuring instrument test; tests were conducted on several soccer schools by the experimental method. During the tests, the experts and the researcher took notes of both observations and evaluations. Then, the result was discussed and evaluated by the researcher, the trainers and the observers in which the draft got any corrections. The above steps are shown in Figure 1.

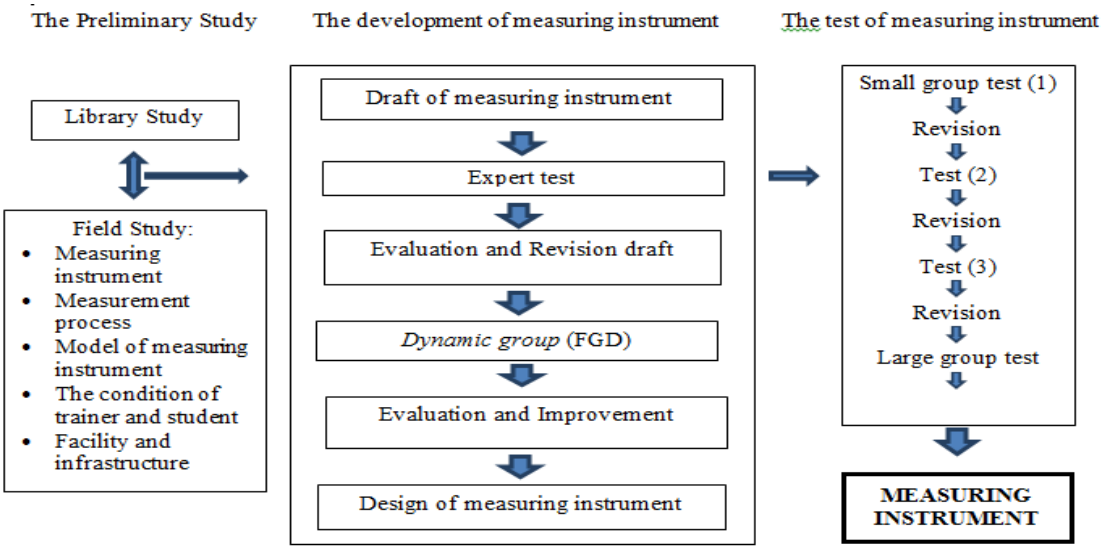

Fig.1. T he research framework for measuring instrument development.

After the draft was revised in accordance with the result of expert validation and FGD, measuring instrument was tested three times in small groups and a single test in a large group. The tests ran from January to September 2015. The first small group test involved 56 students, the second group were 12 students, while the third group belonged to 21 students. The revisions were made on the basis of data analysis, notes, and input of the experts and the trainers. The chronology can be seen in table 1.

TABLE 1: THE CHRONOLOGY OF MEASURING INSTRUMENT

Type of test	Small Group Test			Large Group Test
	Test I	Test II	Test III	
Long Passing				

Basically, the data used in this research was qualitative and quantitative data in which the qualitative data had been done since the beginning of the research activities and it went on and on until finished. Whereas, the quantitative data were collected through experiments in small and large samples that included on primary data. Besides, the subjects of this research were soccer school students of Medan City, namely Soccer School Gumarang, Soccer School Kenari, Soccer School Patriot, Soccer School Bhineka, Soccer School Bima, Soccer School Mandiri, Soccer School Putra Melati, Soccer School Perfect Unimed, and Soccer School Tasbi. Then, the tests were conducted on Saturday and Sunday and after that, the researcher did revisions. The revisions were based on the results of the data obtained, notes, the experts' advice, and the trainers. The similar activities were done continuously to get a measuring instrument that could describe the true skill of students who were tested.

The data obtained were tested its validity and reliability. To ensure the data were correct, the researcher used some threats to increase the persistence of the students. Likewise, Sugiyono (2015: 270) states that the validity test of data in qualitative research includes credibility test (internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity).

III. RESULT AND DISCUSSIONS

The result of preliminary study or field finding is described and analyzed in order to get a formulation of the data that has been collected. The formulation is a descriptive and analytical that refers to the purpose of the preliminary study. Then, the result of need analysis and field finding gained by the trainers toward the students are done only through the observation. In addition, the questionnaire given to both trainers and parents also obtain that the measuring instrument to assess the long passing skill of students is very needed. Based on this phenomenon, the researcher develops a model of measuring intrument for long passing skill for Soccer School students who were in 14-15 years old. The draft made is consulted to the experts.

The development of the instrument is designed in un interrupted repetition the students start the test from a 2 x 2 m square box and there are two instructions must be followed, they are 'ready and yes'. The first thing that the students do is standing in the square box, while the officer gives a signal 'yes' to start. Then, the student should kick the ball to the target 3 times, which the target area is divided

into three parts (each part has score 3, 2, and 1). Besides, the scoring does not just come from the target area, but it also gain from the duration which is recorded in stopwatch. Thus, the students try to get a high score as fast as they can. A simple scheme of this test field is drawn in Figure 2.

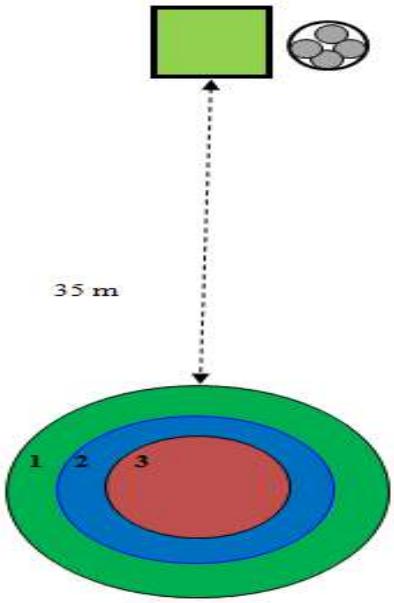

Fig. 2. Scheme Instrument

In addition, the draft designed is validated by 3 soccer experts, 2 A AFC licensed coaches, 1 soccer lecturer, 3 evaluation experts and 2 experts of test and measurement. The experts' record of the initial draft is (a) each test item must be completed with a description of the assessment, (b) the use of consistent terms, (c) the corrected editorial, (d) each test item should be timed (not only the total time), (e) consider the repetition of each test item.

A. Result of Development Test

The researcher tested the draft to both small group and large group. As a result, there were some occurrences during the testing process, namely (a) the target distance of long passing is too far, and (b) the target size of long passing is not ideal, as shown in table 2:

TABLE 2: THE DEVELOPMENT OF MEASURING INSTRUMENT

Type of test	Small Group Test			Large Group Test
	Test I	Test II	Test III	
Long Passing	▪ The target is too far 35 m ▪ The target area of the test is less proportional (1: 6 m, 2: 4.5 m, 3: 3 m) ▪ Repetition is played three times	▪ The target is still far away (30 m) ▪ The target area of the test is proportional (1: 6 m, 2: 4 m, 3: 2 m) ▪ Repetition is reduced from three times to two times.	▪ The target is ideal (25 m)	

The development of long passing skill must meet the validity and reliability test. The test results of validity and reliability are as follows:

TABLE 3: THE RESULT OF VALIDITY TEST

No	Component of *Long Passing*	Test Phase							
		Test 1		Test 2		Test 3		Large Sample	
		r	Exp.	R	Exp.	r	Exp.	r	Exp.
1	Pedestal position	0,110	TV	0,664	V	0,617	V	0,969	V
2	Viewpoint	0,623	V	0,623	V	0,854	V	0,930	V
3	Kicking foot position	0,552	V	0,622	V	0,790	V	0,721	V
4	Ball position	0,415	V	0,862	V	0,577	V	0,947	V
5	Power	0,650	V	0,412	TV	0,820	V	0,969	V
6	Follow through	0,215	TV	0,811	V	0,832	V	0,847	V

The data above shows that the 1st test was an invalid long passing component that is foot position and follow through, so as it was performed and tested in the 2nd test. Later on, the 2nd test result exhibited that there was an invalid long passing component, namely power used to kick, then it was revised and tested on the 3rd occasion. While in the 3rd test evidenced that the overall data was valid and subsequently performed in a large sample. In the last sample test, it was valid which meant the validity of measuring instrument development had fulfilled the validity test.

TABLE 4: THE RESULT OF THE RELIABILITY TEST

No	Test	Category	Reliability score	Criterion
1	Test 1	Score	0,460	Unreliable
		Time	0,481	Unreliable
2	Test 2	Score	0,610	Reliable
		Time	0,674	Reliable
3	Test 3	Score	0,905	Reliable
		Time	0,714	Reliable
4	Large sample test	Score	0,781	Reliable
		Time	0,836	Reliable

The result table shows that in the first test of the score and period is not reliable, so the measuring instrument is repaired and tested in the 2nd session. Afterward, the 2nd test shows that the score and time categories are declared reliable. Even, it has reliability, the development of measuring instrument does not stop in the 2nd test, because it still has invalid long passing component. So as either the improvement or the experiment in the 3rd test are conducted. Surprisingly, the reliable data from both score and time has required the reliability test. Furthermore, the measuring instrument is tested in a large sample and the result shows that the instrument is valid (V) and reliable. Thus, it can be stated that the development of measuring instrument can be used to measure long passing skill in soccer.

The final result of this scoring field scheme which obtains satisfactory result changes from the initial schema. The transformation is described in the following table.

TABLE 4: CHANGES INSTRUMENT BETWEEN INITIAL AND FINAL DESIGN

Initial Development	Final Development
Long passing distance 35 m	The long passing distance of 25 m
3 times repetitions	Twice repetitions
The radius of a long passing target circle is 3 m for score 3, 4, but 5 m for score 2, and 6 m for score 1.	The radius of a long passing target circle is 2 m for score 3, 4 m for score 2, and 6 m for score 1.

B. Discussion

Based on the statistical calculations mentioned before, it is proven that the long passing skill instrument developed is valid and reliable. It is in accordance with the theory that students who have the accurate long passing ability will get high scores and shorter duration. Simirlarly, Cripps, Hopper, and Joyce (2015) by the title *Inter-Rater Reliability and Validity of The Australian Football League's Kicking and Handball Tests* reports that kicking and handball skills have strong validity and reliability[5]. Zago, et.al (2014) states that skilled players take less time in completing tests because they are able to control the ball while running through shorter paths[27]. Russell, Benton, and Kingsley (2010) in their research entitled Reliability and Construct Validity of Soccer Skills Tests That Measure Passing, *Shooting*, and Dribbling report that *shooting* measurements are valid and reliable in measuring football skills[21].Thus, the long passing skill of Soccer School students generated in this study can be proven and it has good validity and reliability in measuring the skill of Soccer School students.

IV. CONCLUSION

Based on the experiment test conducted in both the small groups and the large group, it can be drawn a conclusion that the long passing skill measuring instrument for Soccer School students in Medan is valid and reliable. Hence, the required instrument is able to be applied in soccer activity for measuring students' long passing skill that is beneficial for evaluation process.

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The 4th International Seminar on Public Health Education (ISPHE 2018)

The Effects of Skills-Based Health Education on Students' Knowledge, Attitude, and Behavior towards the Prevention of Environment-Based Diseases

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***Abstract*— Environmental-based diseases are ones of the causes of death. This research aims to analyze the influence of Skills-Based Health Education (SBHE) on knowledge, attitude, and behavior of the elementary school students of Sekaran Semarang towards the prevention of environmental diseases. The study used a quasi-experimental design with a one-group pretest-posttest design. A bivariate analysis of 68 students' responses using McNemar test showed a significant effect of SBHE on students' knowledge and attitude but no effect on their behavior.**

Keywords— SBHE, environment, knowledge, attitude, behavior.

I. INTRODUCTION

Environmental-based diseases still dominate health problems in developing countries. Environmental-based diseases can occur due to an interactive relationship between human, behavioral, and environmental components that have potential diseases [1]. Environmental-based diseases are causes of serious public health and even the leading causes of death. Public awareness of the importance of maintaining hygiene and health is still low resulting in various diseases easily emerge and develop. One of the environmental-based diseases is dengue fever. HL Blum's states that environmental health and human behavior are two dominant factors that affect the health status of a society [2].

Various human development activities that done individually, in groups or programmed because the interests of the state or even the world will have impacts. These factors can cause susceptibility to the body's ability to ward off diseases so that these generate various environmental-based diseases that complement the collection of diseases in Indonesia [3].

At present, environment-based diseases are still public health problems in Indonesia. Upper respiratory tract infection and diarrhea which is an environment-based disease always included in the top 10 diseases in almost Puskesmas throughout Indonesia. The high prevalence of environmental-based diseases, among others, is caused by environmental factors and low clean and healthy life behavior4. Purwandari et al. stated that there is a significant relationship between handwashing behavior and diarrhea incidence in school-aged children in Jember District (p-value: 0,000)5. According to a research by Rusmanto and Mukono, it was said that there is a significant relationship between personal hygiene with the helminth infection (p-value: 0,045) [6]. The results showed that there were differences of knowledge (p-value: 0.001) and hand washing behavior (p-value: 0,039) among the experimental group and control group [7].

The results of preliminary observations made on February 9, 2018, showed that the environmental health conditions in SDN 01 and SDN 02 Sekaran Semarang were classified as lacking. This was indicated by the lack of sanitation around the school that is still dirty, smelly toilets, stagnant waterways, improper waste management, and school canteens look dirty and unhygienic.

The results of interviews with the Principal of SDN 01 and SDN 02 Sekaran Semarang revealed that there are ten diseases often occur in their students, namely: fever (influenza), upper respiratory tract infection, sore throat, diarrhea, typhoid, chicken pox, dengue hemorrhagic fever, conjunctivitis (red eye) , and skin diseases. So far, students and teachers have not received any material on basic skills in the form of health education (SBHE), or educational health in order to prevent the occurrence of environmental-based diseases. According to both principals, that students' knowledge, attitudes and behaviors about environmental health in schools are lacking.

Based on the above background information, the problem under study can be stated as 'How does SBHE influence the knowledge, attitude, and behavior of students as an environmental-based disease prevention on SDN 01 and SDN 02 Sekaran Semarang?'. The purpose of this study is to determine the effect of SBHE on students' knowledge, attitude, and behavior towards the prevention of environment-based diseases.

II. MATERIAL AND METHOD

This study used a quasi-experimental design with one group pre-test and post-test design. The study was conducted in 3 months. The time of research implementation was in March until May 2018. The study population was elementary

school students of SDN 01 and SD N 02 Sekaran Semarang amounting to 408 students. The sample size was 68 students generated using a purposive sampling technique.

The research instruments used in this research are observation sheets, questionnaires for knowledge, attitude, and behavior. The observation sheets were used to record and assess SBHE and environmental health conditions at SDN 01 and SDN 02 Sekaran Semarang. Questionnaires are used to determine or measure the level of knowledge, attitudes, and behavior of students about SBHE. The data were collected by means of measurements and interviews. These techniques are used to retrieve data about the level of knowledge, attitudes, and behavior of students before and after implementing SBHE as a preventive effort against the incidence of environmental-based diseases.

A univariate analysis was performed by using frequency distribution test on a computer application. Univariate analysis results presented in the form of narration, tables, and graphs, which consists of knowledge, attitude, and behavior of students SDN 01 and SDN 02 Sekaran Semarang. A bivariate analysis in this study was conducted to analyze the effect of SBHE on the level of knowledge, attitude, and behavior of students at SDN 01 and SDN 02 Sekaran Semarang. The statistical test used was the McNemar test.

III. RESULT AND DISCUSSION

The result of univariate analysis of the knowledge variable showed that the pretest score of the students' knowledge of the "Bad" category is still 44.1%. There was an increase in the value of knowledge of "Good" category, from 55.9% to 72.1%. There was a decrease in the value of knowledge category "Bad" from 44.1% to 27.9%. The students' knowledge data can be seen in Table 1.

TABLE I. KNOWLEDGE TEST BEFORE AND AFTER SBHE

Know-ledge	Test results			
	Pre	***%***	***Post***	***%***
Bad	38	44,1	19	27,9
Good	30	55,9	49	72,1
Total	68	100	68	100

The results of univariate analysis of attitude variable showed that the pretest attitude of students attitude of "Bad" category is still high, that is 80.9%. But there was an increase in attitude value category "Good", ie from 19.1% to 54.4% while the attitude value category "Bad" decreased from 80.9% to 45.6%. Students' attitude data on SBHE can be seen in Table 2.

TABLE II. AATTITUDE TEST BEFORE AND AFTER SBHE

Atti-tude	Test results			
	Pret	***%***	***Post***	***%***
Bad	55	80,9	31	45,6
Good	13	19,1	37	54,4
Total	68	100	68	100

The results of pre-test and post-test (Bad or Good category) on student behavior variable did not show any decrease or increase. The data about the result of students' behavior can be seen in Table 3.

TABLE III. BBEHAVIOR TEST BEFORE AND AFTER SBHE

Beha-vior	Test results			
	Pret	***%***	***Post***	***%***
Bad	14	20,6	14	20,6
Good	54	79,4	54	79,4
Total	68	100	68	100

The bivariate analysis using McNemar test in this study showed a significant effect of SBHE on the knowledge and attitude of the students of SDN Sekaran Semarang. However, the behavior of elementary school students SDN Sekaran Semarang was not influenced significantly by the provision of SBHE. The p-value values of the three bivariate analyzes can be seen in Table 4.

TABLE IV. BIVARIATE ANALYSIS RESULTS

Varilable	***p-value***
Knowledge	0,000
Attitude	0,000
Behavior	1,000

Providing SBHE to elementary school students of SDN Sekaran Semarang shows an improvement of students' knowledge about the basic skill of health equals to 63.33%. This student knowledge is the main provision in the framework of disease prevention, especially environmental-based disease [8]. Elementary students who have good knowledge of SBHE can reduce the risk of contracting the disease in school. In this way the incidence of environment-based diseases in elementary school students can be suppressed[9]. The result of data analysis showed that there is a significant SBHE influence to students' knowledge.

The attitude of elementary school students SDN Sekaran Semarang changes after the provision of SBHE. The results of the study show a very high increase in students' attitudes ("Good" category) equals to 185%. The attitude of elementary students who have been formed like this is based on the good students' knowledge as well. The result of the research data analysis shows the significant effect of SBHE on the attitude of the students of SDN Sekaran Semarang. This is in accordance with the results of the study of Elsa et al (2014) which explains that the application of education of environmental care characters using inquiry methods can improve understanding and lead to changes in the attitude of the pupil [10].

SBHE that has been given once cannot result in any change of students' behavior. It is said by Fountain and Gillespie that achieving knowledge, attitude and skill objectives takes time, and is unlikely to be the result of a single lesson [11]. In this study, the behavioral variable is not significantly affected by SBHE on students. This is in line with the results of Muliana et al.'s study which states that the average grade of students' knowledge of environment is in the

high category while the students' behavior is in the low category [12].

IV. CONCLUSION

Based on the results of research that has been done can be concluded that the provision of SBHE improves the level of knowledge and attitude variables of the SDN Sekaran Semarang students. The behavior variable, however, shows the same value between before and after SBHE to the students. Besides, SBHE influences significantly to the level of knowledge and attitude variables but not to the behavioral variable as this newly-performed training has not been able to change student behavior.

The results of this research are expected to provide information on the basic educational environment related to the prevention of environment-based diseases through the application of SBHE to students. It is expected that other researchers will conduct related studies by increasing the number of treatments (training) and using other research designs.

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The Contribution of Eye and Hand Coordination to Under Passing Volleyball of Extracurricular Students SMP Negeri 4 Pekanbaru

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***Abstract*— Based on the writer's observation in the field shows that the ability of under passing students extracurricular SMP Negeri 4 Pekanbaru still low. This study aims to determine whether there is a contribution of eye and hand coordination of under passing the volleyball of extracurricular students SMP Negeri 4 Pekanbaru. Research method is a correlation method. The total population in this study amounted to 15 male students using total sampling technique. The population is sampled so that the number of sample in this study is 15 extracurricular students SMP Negeri 4 Pekanbaru. Based on the calculation of product moment's correlation is obtained r value (correlation index) variable x and variable y or rxy value. Great value rxy = 0.538. The r value of the table at n = 15 or df = 13 is 0.514. The result of comparison or between r arithmetic and r table found that the value of r h> r t or 0.538> 0,514. Because the value of r count is greater than the value of r table then there is a contribution between the two variables. Thus the hypothesis is that there is a contribution of eye and hand coordination with under passing ability the volleyball of extracurricular students SMP Negeri 4 Pekanbaru and it is acceptable. Based on data analysis and discussion it can be concluded that there is contribution of eye and hand coordination to under passing's volleyball of extracurricular students SMP Negeri 4 Pekanbaru at 28, 9%.**

Keywords—volleyball, contribution of eye and hand, and coordination

I. INTRODUCTION

Sport is an investment in the future. Through the exercise, human beings will be healthy and fit so that the mental and character can be built. As the proverb in the world of sports says *"Men Sanna in corporesanno"* which means"within a healthy body there is a strong soul "has a very deep meaning, that the health of the body has a very strong influence towards the development of the soul. In this situation, the sport is supposed to be a pillar ofconformity, healthy life and harmonious balance. Sport is able to form the souls and characters. The soul of fairplay, sportsmanship, team work and uphold nationalism can be built through sports. But the next issue is how strategic efforts to develop the sport in the development of the character so that at the end of the sport becomes more valuable and efficient. This is not an easy job for a developer of sports in order to optimize the character building such as in Indonesia that is multi characters.

Onemethod is by introducing sports from the level of formal education or school. The sport is introduced from basic education up to high school. In schools, sport is one of the compulsory subjects.

As stated in the Constitution of the Republic of Indonesia No. 3 year 2005 article 1 and 2 which reads (1) sports the education is organized as part of the education process. And (2) sports education is implemented at both the formal and non-formal education path through intracurricularand/or extracurricular activities.

From the above articles can be explained that in education, the existence of the sport cannot be separated. This is because to achieve the accomplishment in the world of education requires a healthy body and soul. It can be done by keeping the health and exercise. In these subjects, the students are taught various sports, and one of them is a volleyball. Aside from the subject, volleyballis also interestingto students inextracurricular activities.

The volleyball is a team game with a total squad of six people on its team. The volleyball is one of the sports that is played by volleying the ball over the net, with the aim and purpose to drop the ball into the opponent's side of the court to seek victory in the play.

The basic technique is one of the main factorthat can measure the level of proficiency in playing volleyball, in addition the factors of physical condition, players' mental and strategy formulation. Therefore, each player is obliged to know the basic technique and learn it. If in a team all the players have a good basic technique, it can be ascertained that the team has the strength and quality of a good team.

One technique is oftenused in the volleyball is under passing. Under passing in the volleyball is the foundation that must be mastered by every player. Under passinghassome functions to restore services, give feedback, and passing the ball to the opponent's side of the court. Under passing is a step to take the ball by using two arms that are combined and hit on a little above of the wrist.

Under passingshould be done with either appropriately good direction or height. Under passing will be forwarded to feed to the other players. In order to perform a goodunder passing, a player should train regularly, besides technical and physical training should be also undertaken. There are several

physical conditions that affect the ability of under passing in volleyball game and one of them is the coordination of eye and hand.

Coordination is a person's biomotorability to perform the sequence of movement properly, correctly and accurately without experiencing interference.When is briefly engaged with the eyes and hands, can be interpreted as the ability of doing hand gestures when doing the movements of objects in order to move right to the target seen by the eye.

Based on the results of observation that the researcher did on extracurricular students SMP Negeri 4 Pekanbaru when they practiced volleyball, researcher found few problems related to the capability of under passing, among others, as followed: when doing the under passing, swing too hard that balls go wild that it is related to the rhythm of the incorrectly under passing movement, under passing which is not accurate in the direction or the height that it is related with the eye and hand's coordination of students. Students often are not ready to accept the ball that it is related to the speed of students' reaction. The results of under passing are sometimes too fast that it is related to the strength of the students' arms muscles that is less controllable.

Based on the results of that observation, researcher is interested in holding a final assignment as a research student. The title of the research to be raised is the contribution of the eye and hand's coordination of under passing the volleyball of the extracurricular students SMP Negeri 4 Pekanbaru.

II. MATERIALS AND METHODS

The type of research is correlation method. The variable X in this research is the coordination of eye and hand and the variable Y is the ability of volleyball'sunder passing.

Researcher takes extracurricular students of SMP Negeri 4 Pekanbaru to serve as the research population. The number of students extracurricular SMP Negeri 4 Pekanbaru are 15 male students. In this researchis devoted only on the male students for the homogenous research as the number of male student population is not too many then the researcher uses the technique of total sampling or the whole population is used as samples. Therefore the number of the sample in this research is 15 extracurricular students of SMP Negeri 4 Pekanbaru

III. RESULTS AND DISCUSSION

Researcher did aresearch on the volleyball court in SMP Negeri 4 Pekanbaru. In line with the number of variables the research which amount 2 pieces, researcher conducted two types of tests. The first test that is a tennis ball-throwing test to measure eye and hand coordination and a under passingtest to determine the students' under passing volleyball ability.

From the results of data above can be explained that the coordination of eye and hand are known to contribute to the ability of volleyball's under passing. To perform a good under passing, a player must be able to direct the ball with the direction and height as aimed. This requires that a volleyball player has a good degree of accuracy. The level of accuracy relates to the coordination of eye and hand of the player.

With good eye and hand accuracy, theplayer can move his hand to dounder passingof the volleyball and direct the ball to the aimed target or to the partner. Thus the ball of the under passing can be precisely up to the intended recipients with accurate direction or height.

From the results of this research, the contribution of the eye and hand's ability of under passing is 28.9%. The percentage means each perform of under passing, 28.9% of those passing success is influenced by the level of coordination of eye and hand of the player. Other supporting factors in volleyball under passing of 71.1% are influenced by other supporting factors besides the coordination of eye and hand.

These factors include passing basic techniques, the strength and balance of the arm muscles. Passing basic techniques are efficient to perform a series of motion basic techniques to well under passing.The next factor is the factor of arm muscle's strength, it is used to hold the speed of the ball to be reflected back towards the aim. Strength of the arm muscles according to Wiarto (2013:17) is the ability of a muscle to do the contractions that are efficient to evoke the tension on a resistance. This is useful to hold the ball that glides so that the ball is able to bounce towards the aim.

A balance factor is useful to keep the body stable when taking the ball with under passing. The balance factor is also required so that the player can receive the ball without falling, so it can perform advanced motion when necessary. Ismaryati (2008:48) "balance is the ability to maintain the balance in a state of still or moving.

In addition to these factors, the speed of reaction in taking the ball with the technique of under passing is also a factor that affects the ability of volleyball under passing. The speed of reaction according to Ismaryati (2008:72) reaction time is the period between the stimuli received by the beginning of a reaction or response. All information that is received by the sense both from inside and outside is called stimuli. Sense will change the information into nerve impulses and can be understood by the brain. In volleyball, the stimuli appears from the arrival of the ball towards the player, and the response is set upunder passing technique as quickly as possible to fend the ball that came.

IV. CONCLUSION

Based on data analysis and discussion, it can be concluded that there is conclusion of the contributionthe eye and hand's coordination against under passing of the volleyball extracurricular student SMP Negeri 4 Pekanbaru 28.9%. Comparison of results obtained that the value r (0.538) > r table (0.514).

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Building Cooperation Interpersonal Skill in Physical Education Lessons Through Traditional Game

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***Abstract*— Cooperation as interpersonal skill is one of the four important competencies that must be possessed by learners to be able to lead a successful life in the 21st century. Therefore, teachers, who are usually only concerned with assisting students to meet certain hard-skill qualifications, are now also required to include cooperation in their objective. Therefore, teachers, including physical education teachers, must be able to develop teaching materials to meet such demands and all the while promoting physical activities. Games can become a reliable teaching resource to increase learners' involvement in learning and to create a cooperative learning environment. Hence, this article is focused in describing the results of the teacher's competence advancement activities as an effort to develop game as a resource to teach cooperation. A total of 23 games were selected to be played by 33 prospective PE teachers and 20 experienced PE teachers at elementary level to increase teacher's competence in the development of game as teaching resource. Assessment results stated the 23 games were appropriate (77.5%) to create an environment in which learning process that promotes cooperation to students could take place. In addition, score of teacher knowledge of game as teaching resource is 59.8% (adequate). Thus, trainings in developing game as a resource to teach cooperation in learning for Elementary School Students is necessary, specifically for elementary school physical education teachers.**

Keywords*— *interpersonal skill, emotion regulation, cooperation, physical education lessons, traditional game

I. INTRODUCTION

Indonesia's education goals have been formulated at least through legislation and / or products in the form of government regulations which regulates education. The arrangement of education in schools is systematically regulated by the government through the national curriculum which is the realization of the full authority of the government in regulating national education [1]. With the help of experts from universities, the government uses its authority to compile the national curriculum. Universities are considered as a strategic institution to contribute in developing national education.

In 2012 and 2016 in its convention, ALPTKNI (Association of Higher Education Institutions of State Education of Indonesia), declared efforts to improve the quality of education to prepare learners for Indonesia Golden Generation 2045. Indonesia Golden Generation 2045 is a Pancasila-spirited Indonesian who has global and futuristic skills, who is able to utilize science and technology based on cultural values and nationalism, and give benefit to mankind [2]. Therefore, it can be concluded that Indonesia Golden Generation 2045 must have good character and will most likely be realized through the education process.

Thus, along with preparing learners to lead a character human, education in Indonesia is also directed to educate students to master the 21st century interpersonal skills competence, namely collaboration, communication, critical thinking, and creative [3]. These four characters are considered important to be mastered so that learners are able to survive and compete in life in the 21st century.

Character education in Indonesia has long been echoed through the school curriculum. In the composition of the education curriculum in Indonesia, Physical Education (PE) becomes a compulsory subject in the curriculum structure of the school [4] which focuses on character education through the internalization of values of motion and sport activities [1]. Movement skills and sport are believed to be a suitable tool for forming interpersonal skills of learners [5].

PE learning is almost always done in groups facing tactical problems in sports games, and requires students to obey the rules. Thus, this activity is believed to be a suitable way for the process of habitually behaving well for building positive interpersonal skills. Furthermore, students who participate in cooperative learning programs designed specifically in accordance with the needs of students proved to improve social skills and attitude that prioritizes cooperation [6].

In addition, PE is also the most strategic vehicle for promoting an active lifestyle in school [7]. Positive impact of active life behavior that is avoid disease, heighten life expectancy, and reduce excess weight [8]. For that, PE can be called as the ideal subjects in preparing the Indonesia Golden Generation 2045. Because strengthening the character alone is not enough without being equipped with excellent physical condition. Learning PE has both of these things, namely strengthening the character of PE and providing physical education to a healthy man avoid the pain through active life behavior. The current state of illness is at an alarming point, especially pain due to passive living behavior. WHO reports that inactive living habits are the four main factors of death in the world [9]. For that, Indonesia needs to encourage its

citizens to change the passive lifestyle towards the more active life. According to the results of a national survey by the Ministry of Youth and Sports of the Republic of Indonesia, shows that only 22% of Indonesians who exercise and the number is decreasing daily [8].

Passive lifestyle problems will be more difficult to address if PE fails in providing learning to familiarize life active to school-aged children. School-age children tend to spend their free time watching television, playing video games, and playing computer [10]. Children today tend to prefer modern-looking games like video games, play-station, and online games compared to traditional games with terms of character and physical activity [11]. No doubt that children now tend to be curious and challenged with the modern game. So much of their free time is spent on playing the game. If this is left unchecked, the adequacy of child's motion will not be fulfilled.

To help overcome the above challenges, PE learning, especially at the elementary level, should be complemented by a variety of simple and / or traditional game activities that can help instill good interpersonal character while promoting an active lifestyle in its teaching materials [12]. The selection of game types to be taught to learners should match the child's development. Thus, the desire to move and the needs of student movement can be fulfilled and students' learning needs can be facilitated.

Learning that can facilitate learners to learn is quality learning. Quality learning will only be realized if done by a qualified teacher who becomes the main key [13, 14, 15]. Therefore, in order to fulfill the existing demands, the development of teacher competence so that the educational process especially in the schooling path becomes important to be done [16]. Development of teacher competence is needed to be able to develop the teaching materials in the form of simple and traditional games performed in accordance with the development of children.

This article is part of the results of teacher competence development in developing teaching materials in the form of simple and traditional games through the community of teachers PE in elementary school. The development of teacher competence through the community is felt to be effective because the teacher community is the main place for teacher competence development. There are five important things that make the teacher community the main place of teacher competence development, namely: (1) supportive and shared leadership; (2) shared values, vision, and goals; (3) collective learning and application; (4) shared individual practice; and (5) supportive conditions (both physical and human) [17]. There are 23 types of games given to the teacher community during teacher competency development activities. Simple and traditional game material given to the community, directed to a game that affects the character of cooperation for learners according to the literature. For that, need to be assessed game-game as the material in forming cooperation learners through teacher opinion. In addition, through this teacher's competency-building activities, teachers' knowledge of simple and traditional games will be explained.

II. MATERIALS AND METHODS

A. Participant

This article is part of the results from teacher competence development activities in developing teaching materials in the form of simple and traditional games. This activity involves prospective PE teachers, PE teachers, and researchers (lecturers).

A total of 33 prospective PE teachers and 20 PE teachers participated in this study. Both prospective teachers and teachers of PE follow voluntary activities to develop competence as prospective teachers and teachers of PE.

B. Procedure

The activity begins with the preparation of a research team in recruiting prospective PE teachers who volunteer to participate in the event. The research team trained prospective PE teachers to practice 23 types of games as teaching materials, which are: (1) Mencari kelompok; (2) Bersatu kita teguh; (3) Menjala ikan; (4) Hitam hijau; (5) Banjir, gempa, dan tsunami; (6) Rajawali mengejar anak ayam; (7) Bermain angka (ganjil, genap); (8) Karapan sapi; (9) Tom and Jerry; (10) Beteng-betengan; (11) Gobak Sodor; (12) Estafet; (13) Lempar kejar bola; (14) Berburu binatang; (15) Pulau impian; (16) Mencuri harta karun; (17) Kotak Pintar; (18) Boy-boy-an; (19) Tongkat jalan; (20) Tee ball; (21) Kasti; (22) Kippers; dan (23) Slagball.

The development of PE teacher competence is carried out in training activities starting from the giving of material in the form of the importance of fulfilling the physical activity of learners and the character formation of learners, and the process of developing simple and traditional game material. The activity continued with the practice of 23 games as training materials divided into 3 practice sessions. Once practiced, prospective PE teachers and PE teachers are welcome to try and develop the games that have been practiced.

C. Instrumentation

Two instruments are used in obtaining game conformity data in learning the cooperation of learners and knowledge of PE teachers on the development of simple and traditional game materials. Two instruments used are closed questionnaire developed using Likert scale.

The first instrument used to determine the suitability of simple and traditional games to teaching cooperation to learners. It is an instrument that collects teacher assessments based on teachers' perceptions of the 23 types of games practiced by potential PE teachers. Questionnaire is closed by using likert scale from inappropriate to very suitable.

The second instrument is used to find out the teacher's knowledge in the development of simple and traditional games. In addition, this instrument comes with the experience of teachers in making use of simple and traditional games in learning events. This instrument is developed based on teacher's knowledge. Likert scale used ranging from not knowing to ever teach.

D. Data analysis

Data analysis used is descriptive statistic and percentage.

III. RESULTS AND DISCUSSION

The results explain three things, namely: (1) knowledge of PE teachers on simple and traditional game materials; (2) the appropriateness of simple and traditional game material to promote cooperation to learners; and (3) experience of PE teachers in providing simple and traditional game materials in learning. The value of knowledge of PE teachers about simple and traditional game materials get the value of 59.8 included in the category enough. Meanwhile, according to PE teachers, the value of the conformity of simple and traditional game materials to teach cooperation to learners of 77.5 included in the appropriate category (see table 1).

TABLE I. RESULTS OF TEACHER KNOWLEDGE ASSESSMENT OF GAME MATERIALS AND THEIR CONFORMITY TO COOPERATE LEARNING TO LEARNERS.

No.	Assessment component	Value	Category
1	PE teacher's knowledge of simple and traditional games	59.8	Adequate
2	The suitability of simple and traditional games to establish cooperation	77.5	Suitable

Furthermore, 39.9% of PE teachers claimed to have never used simple and traditional game material, as many as 27.5% admitted to using game material for warming up, 29.6% claimed to have used game material for the main lesson, and 3.0% admitted to using game material for cooling down (see table 2).

TABLE II. EXPERIENCE OF PE TEACHERS IN USING SIMPLE AND TRADITIONAL GAME MATERIALS IN LEARNING.

No.	Experience of PE teachers	Percentage
1	Never used	39.9%
2	Using game material for warming up	27.5%
3	Using game material for the main lesson	29.6%
4	Using game material for cooling down	3.0%

Teachers' knowledge of the subject areas of teaching is one of the measures of professional competence of teachers [18]. The development of competence of prospective teachers while studying in college becomes the right time to strengthen student competence to become a qualified teacher. Unfortunately, universities are currently underprivileged to prepare prospective teachers to become good teachers [19]. Therefore, the development of teacher competence is not sufficient only in universities when prospective teachers are studying, but it is necessary to develop sustainable teacher competence as they become teachers.

Ideally, teacher competence development is the responsibility of every teacher. However, the willingness of teachers to develop themselves to improve teacher competence decreases with the longer teaching time [20]. For that, there needs to be collaboration between various institutions to support and encourage teachers to be aware of the needs of self-development in a sustainable manner. Continued development of teacher competence needs to be supported by good collaboration from governments, universities, and schools [21]. The government provides encouragement in the form of various certification programs with high incentives, universities as a place of science novelty and innovation in learning, while schools through the principal must provide assistance to teachers in learning innovation [16].

Based on the results of the knowledge assessment (see table 1), it illustrates how efforts to improve teacher competence still need to be done. Collaboration of government, college, and school becomes important to do. This training is a reflection that teacher's knowledge of game teaching materials that are at the core of the material in elementary school is not enough for teachers to create good learning.

Unfortunately, these training activities are still not able to provide the maximum to provide training materials to teaching cooperation to learners (see table 1). According to the teacher's perception, there is still training material to develop teacher competence can't be used to teaching cooperation to learners. Games that are not suited to teaching cooperation to learners is an individual game. As a result, in the learning process there is no process to familiarize learners in cooperation. The learning process for improving character-cooperation is a learning that is able to provide a learning environment in which there are good character habits [1].

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IV. CONCLUSIONS

Looking at the results of PE teacher knowledge assessment of simple and traditional game materials, there is an indication that the existence of PE teacher competency development activities is increasingly needed. Of course, the development of teacher competence will involve the government through its rules, the college through its novelty and scientific innovation, and the school through the assistance of the principal. The existence of material that is considered not suitable for teaching cooperation to learners indicates that is still needed for the study literature and even discussion with experts related material development of teacher competence. So game materials can have an impact on teacher knowledge and skills in developing game materials that can create a learning environment that familiarizes cooperation activities and fulfillment of physical activities of learners.

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Immunization Coverage on Infant in Three Districts of Central Java Province

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***Abstract*-The coverage of complete basic immunization in Central Java decreased from 100.7%, 93.4%, and 97.2% during 2013-2015, as the number of measles cases increased from 32, 308 and 576. The aim of this research was to analyze the coverage of immunization in Semarang City, Brebes District, and Surakarta City of Central Java Province. The observational descriptive with quantitative and qualitative approach was conducted using of 877 infant samples from all districts and the respondents were the infants' parent. The instrument used to measure was Rapid Card Check (RCC) recommended by UNICEF. The results of the study indicated that several infants were still unimmunized. The reasons most often raised by mothers who do not immunize their baby were due to sick children, busy parents working, and religious factors (haram). Immunization is a measure to maintain the infant's health from the disease. It is very important to develop the maternal understanding to increase immunization coverage in three districts.**

Keywords: immunization coverage, Semarang, Brebes, Surakarta

I. INTRODUCTION

Infectious diseases have become one of the problems in Indonesia, as their spreading break over administrative boundaries causing difficulties in eradicating them. Therefore, immunization as one of the prevention of infectious diseases is very cost effective [13].

In Law Number 36, 2009 on Health, every child is entitled to basic immunization and the government is obliged to give complete immunization to every baby and child [13]. Immunization protects children against some Immunizable Diseases (PD3I) (MoH RI, 2016). PD3I is a contagious disease that potentially leads to outbreaks and death especially in Toddlers [14].

Indonesia's health profile reported that, in 2013, the coverage of complete basic immunization reached the target as stated in the Strategic Plan (Renstra) of the Ministry of Health; however, in 2014 and 2015, the immunization coverage did not meet the target stated in the strategic plan. During 2013-2015, the national immunization coverage decreased from 89.9%, 86.9%, and 86.5% [10].

Meanwhile, in Central Java during 2013-2015, the coverage of complete basic immunization was 100.7%, 93.4%, and 97.2%. This might cause by the factthat during 2013-2015 the measles cases increased from 32, 308, and 576 [2].

The cases of measles were identified taking place in several cities/regencies in Central Java, among which were in Semarang City, Brebes Regency, and Surakarta City. In Semarang city the measles cases increased by 137, 219, and 224 in 2013-2015 [4]. Meanwhile, in Brebes District, in 2013, the measles cases were 6, increased to 20 cases in 2014, and increased again to 54 cases in 2015 [3]. Furthermore, in the city of Surakarta, the measles cases were 5 in 2013, and fell to 3 cases in

2014, yet the outbreak of hepatitis B disease increased from 0 cases in 2013 to 126 cases in 2014 [5].

The district/municipal and provincial government shall carry out national planning for the implementation of immunization, which isundertaken by Community Health Center (puskesmas). The immunization planning includes targeting, logistic needs, and funding [12]. In the era of decentralization, strong commitment, operational cost support, and other resources determine the success of the immunization program conducted by local government, as the success of the immunization program might provide high immunization coverage [9].

In regard to the high problems faced by local government in relation to achieve health indicators of infants and toddlers, the coverage of immunization in high risk areas in three cities/regencies in Central Java Province needs to be further examined.

II. RESEARCH METHOD

The research applied descriptive observational design with quantitative and qualitative approach. The location chosen was high-risk areas in three cities/districts in Central Java Province namely Semarang City, Brebes Regency, and Surakarta City, from which 5, 8 and 2 sub districts respectively were chosen to be the locus of examination. The study was conducted in 2 months, starting from February to March 2017.

The population was all toddlers aged 12-24 months who were sampled to be 331 respondents using random sampling technique. Respondents in this study were mothers whose toddlers were selected as samples.

The research instrument used was Rapid Card Check (RCC) form recommended by UNICEF, and theresearch variables were immunization coverage and accuracy of immunization.

Table 1 shows that the percentage of not given the coverage of basic immunization in Semarang City takes place in penta 3 (51.6%) and measles (57.8%); while, in terms of immunization accuracy, the most delayed immunization is measles (71.9%), and the most accurate immunization is HB0, as 67.2% has immunized the baby at the age 0-7 days.

Furthermore, the percentage of not given the coverage of basic immunization in Brebes district takes place in penta 3 and polio (21.5%) and measles (29.1%); while, in terms of immunization accuracy, the highest delayed immunization is measles (59.2%), and the most accurate immunization is HB0, as 72.2% has immunized the baby at 0-7 days old baby.

TABLE 1. RESULT

Variable	Yes		No	
	f	%	f	%
Semarang				
1. Immunization Coverage				
- HB0	47	73.4	17	26.6
- BCG	49	76.6	15	23.4
- Penta 3	31	48.4	33	51.6
- Polio 4	33	51.6	31	48.4
- Measles	27	42.2	37	57.8
2. Immunization Accuracy				
- HB0	43	67.2	21	32.8
- BCG	42	65.6	22	34.4
- Penta 3	22	34.3	42	65.6
- Polio 4	21	32.8	43	67.2
- Measles	18	28.1	46	71.9
Brebes				
1. Immunization Coverage				
- HB0	179	80.3	44	19.7
- BCG	192	86.1	31	13.9
- Penta 3	175	78.5	48	21.5
- Polio 4	175	78.5	48	21.5
- Measles	158	70.9	65	29.1
2. Immunization Accuracy				
- HB0	161	72.2	62	27.8
- BCG	147	65.9	76	34.1
- Penta 3	127	57	96	43
- Polio 4	115	51.6	108	48.4
- Campak	91	40.8	132	59.2
Surakarta				
1. Immunization Coverage				
- HB0	32	72.7	12	27.3
- BCG	32	72.7	12	27.3
- Penta 3	23	52.3	21	47.7
- Polio 4	24	54.5	20	45.5
- Measles	18	40.9	26	59.1
2. Immunization Accuracy				
- HB0	32	72.7	12	27.3
- BCG	24	54.5	20	45.5
- Penta 3	15	34.1	29	65.9
- Polio 4	22	50	22	50
- Measles	9	20.5	35	79.5

Finally, according to research data of basic immunization coverage in Surakarta City, immunization which mostly not given is penta 3 (47.7%) and measles (59.1%); the most delayed immunization is measles (79.5%); and the best immunization accuracy is HB0, as 72.7% has already immunized the baby at the age of the baby 0-7 days.

III. DISCUSSION

In the three areas observed, a number of infants had not been given basic immunization coverage, based on which measles immunization had the lowest coverage; while, the highest coverage immunization was BCG immunization. This state might affect the reduction of complete basic immunization coverage in high-risk areas in 3 cities/districts in Central Java.

Factors affecting the incompleteness of complete basic immunization were obtained from interviews to infants' mothers, health cadres, and staff of community health center. The most common reasons mothers did not immunize their babies in the three areas were sick children, busy working parents, and religious factors; the vaccine used was haram.

According Albertina, the reason of incompleteness of immunization expressed by the mother is that the child is sick when about to immunize (28.4%) and parents are afraid of the side effect of immunization (23.5%) [1]. The sick child was contraindicateto immunization; however, this reasoncould not be underlined an excuse for having complete basic immunization because the child should have been given it as she/he recovered from the illness. In addition, the side effects like fever or cranky child should not also be an excuse because it is mild and insurmountable.

Child delayed getting-immunization affected mothers not taking their children out; as the mother was afraid that the community around her knew her child had not get immunization. In addition, some mothers believed that immunization would have a negative effect on the health of the children such as fever. In this case, mother's knowledge contributed to the lack of information obtained. This finding was similar to one of Maina, stated that maternal education is one of the factors significantly related to immunization coverage [11].

In addition to factors of under-five mothers, health cadres had problems in reaching them as well as less maximal in providing health services. Based on interviews with cadre, the result concluded that sometimes mothers were less cooperative when data collection of immunization coverage were conducted, such as not opening the door, need to make an appointment in advance, and for reasons of economic status. This was consistent with the finding of Harisman that there is a significant relationship between family support and cadre activity in every implementation of posyandu because the family has an important value in any decision making to act for a cadre [7].

In terms of lack of health services conducted by cadres, the cause was that the cadres had too many activities to be done, lack of knowledge about immunization, lack of activities in giving counseling, and limited facilities and infrastructure to do house visits. This was in accordance with the research conducted by Indrawan that posyandu cadres who have less knowledge about immunization mostly play less active during posyandu [8]. Posyandu cadres have not dared to give counseling because the level of knowledge is still not good so there is a fear to make mistake to convey information.

The discovery of children not being immunized was also influenced by factor of community health center officers. The results of interviews with puskesmas staff showed that the lack of health personnel caused officers not directly monitor posyandu activities besides concurrent positions and duties.

Based on the theory of L. Green, factors influencing health behavior related to immunization are predisposing factors include knowledge and attitudes toward health, traditions, and beliefs of the society; enabling factors that include the availability of facilities and infrastructure, as well as reinforcing factors including family support, health workers, and community leaders [6].

IV. CONCLUSION

There are still babies that have not been immunized by their mothers in high-risk areas in three cities/regencies in Central Java namely Semarang, Brebes, and Surakarta. Immunization is one of the ways to keep a baby healthy against disease. Therefore, there is

a need to improve maternal understanding in achieving complete basic immunization coverage for children. In addition, the role of health cadres and health workers need to be maximizedto conduct health services in order to increase immunization coverage. Support of religious/community leaders should also be stimulated to encourage and convince people to immunize their children.

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***Abstract*--This study aims to determine how much the ratio between sport massage and aquatic exercise to decrease lactic acid levels in students of UniversitasNegeri Jakarta. This research was conducted at GelanggangOlahragaRawamangun in December 2017. The method used is the experiment method "One Group Pre-test and Post-test Design". Samples of 20 people from the population of 100 people taken with purposive sampling technique. Data analysis technique used is t-test at significant level α = 0.05 analysis technique started by counting t-value to compare with t-table value at 5% significant level. From the final test data of sports massage and aquatic exercise, the standard difference between two mean (SEmxmy) = 0.81, the value becomes t-value obtained = 4.303. Then the result of the calculation is tested with the table on degrees of freedom (dk) = (N1 + N2) - 2 = (20 + 20) - 2 and the 0.05 confidence level obtained the critical value t-table 2.021 (t-value = 4.303> t -table = 2.021). The final conclusion obtained in this study is sport massage gives a greater influence on the decrease in lactic acid levels than aquatic exercise after recovery for 30 minutes.**

Keywords: sport massage, aquatic exercise, lactic acid

I. INTRODUCTION

Exercise is very beneficial for health. By exercising the body's metabolism becomes increased so that the distribution and absorption of nutrients in the body becomes more effective and efficient.

Exercise is also a very good activity if it's done regularly, which is always done by sports students. In everyday life, sports students have so many physical activities, in the room they have to follow the lectures and outdoors they also have to follow the activities of the sport that they choose, because it is also included in the part of the lecture.

With so much activity, sports students should pay attention to a balance between lectures, exercises and physical condition recovery, in this case, the recovery of the condition is very important in maintaining one's physical condition in order to always be in optimal physical condition. Good recovery should be done immediately after completion of physical activity or heavy exercise.

Not many students know about the importance of recovery or recovery to reduce lactic acid after exercise, in this case as sports students must understand and apply recovery methods so that they do not experience prolonged fatigue and the physical condition will always be well preserved. This study is one of the efforts to find a comparison and effectiveness for a process of recovery of physical condition in terms of decreasing lactic acid levels [3].

Recovery should be done immediately when the condition of the body is exhausted or in other words experiencing buildup of lactic acid, this is done to

make the lactic acid that accumulated immediately reduced and will accelerate the recovery process next. Recovery is divided into two types: active recovery and passive recovery [8].

Active Recovery is a recovery performed by moving or in the form of active movements performed with mild intensity but in a certain period of time such as jogging, cycling and swimming, with the movements or activities will make the blood circulation becomes smooth, which will be helps in the process of lactic acid replacement by the blood circulation to be brought to the liver and converted back into energy. In this research that will be done is the method of aquatic exercise, which is recovery with active movements in the water but with a mild intensity [6].The general characteristic of aquatic exercise is: density, buoyancy, hidrostatic pressure, viscosity, and hydromechanics [9].

Here are the method of aquatic exercise used in this study:

- Water walking or jogging
- Forward and side lunges
- One leg balance
- Side stepping
- Hip kickers at pool wall
- Pool plank
- Carioca
- Rotational wake
- Push ups
- Standing knee lift

Recovery passive is a recovery performed without physical activity, which means that only by silence of the body it will recharge lost oxygen reserves after physical activity, oxygen will be used for lactic acid oxidation process which will convert lactic acid back into energy. In passive recovery thewriter use method of sport massage. Which means patients or athletes who have been doing physical activity get the treatment of sports massage where the patient did not do any physical activity [5].

Sport Massage is a very valuable element in exercises for athletes but for someone who is not an athlete is also useful to maintain and restore a weak physical condition with the effect of stimulation on the body's functions and adjustment of activities performed. Keep in mind that if giving excessive or too much massage will not raise the freshness of body as expected but can even make the patient become limp and sluggish. Otherwise, a massage that is too soft, it has less influence on physical health. While if the massage is too harsh in the emphasis it can lead to bruises or pain massage used [7].

Here are the various manipulations in Sport Massage used in this study [10]:

- Effleurage
- Petrisage
- Shaking
- Tapotement
- Friction
- Walken
- Vibration
- Skin-rolling
- Stroking

Sport Massage is given after a game or exercise with the intention to relax muscles and joints that have worked hard, some of the benefits of Sport Massage are as follows [2]:

- Helps to remove the lactic acid pile.
- Helps the muscles in taking oxygen and nutrients faster so as to speed up the healing process.
- To release the tension or muscle stress caused by excess physical activity.
- Helps disassemble scar tissue that usually affects muscles, tendons and ligaments that affect performance.
- Helps improve the elasticity of the tissue.

Lactic acid is a product of carbohydrate metabolism without the use of oxygen (anaerobic metabolism). Lactic acid is produced in muscle cells when oxygen supply is insufficient to support energy products. Lactic acid is the conversion of pyruvic acid when performing rapid physical activity. Lactic acid that formed and builds up in the muscle causes the cell to become acidic which affects inefficient muscle work, muscle pain and muscle fatigue so it must be interspersed with rest [12].

Lactic acid present in the body after exercise will be partially removed through sweat or urine, and a small amount of lactic acid can be converted back into glycogen form in the liver. It should be disclosed that the formation of glycogen in the liver from lactic acid does not play a very important role in the reduction of lactic acid levels. The biggest reduction of lactic acid is by converting lactic acid

into the blood. This can be done by the muscles, heart muscle, kidney or liver.

According to the classical concept about 20 percent of the lactate produced during exercise is oxidized to pyruvate and then dissolved into CO_2 and H_2O, and the remaining lactate is taken by the liver and forms glucose, which can be converted into glycogen or delivered to the blood. The muscle can then utilize this glucose in its glycogenesis to restore its glycogen depot. Of these calculations, about 85 percent of lactate is converted into glycogen but its way through the liver [1].

Lactic acid is a weak acid. Normally, lactic acid formed in the body will be removed through the muscles, kidneys, and liver. When there is a disorder that interfere with the change in lactic acid it can happen excessive buildup in the body. This buildup causes acid-base balance disturbance in the body. This excessive lactic acid causes the disease of lactic acidosis syndrome. In this syndrome symptoms occur in the form of nausea, vomiting, abdominal pain, weight loss, weakness, respiratory disorders, liver function disorders, heart rhythm disturbances, hands feet become cold and blue. Many causes can cause lactic acidosis, including:

- Body tissue lack of oxygen, for the example due to heart failure, respiratory failure, severe anemia, major bleeding;
- Severe infection ie sepsis;
- Drugs (rare) such as paracetamol, anti-seizure, alcohol, aspirin, and others;
- Congenital disorders

High levels of lactic acid can cause adverse effects such as:

- High concentrations of lactate lead to acidosis in and around the muscle cells.
- High levels of lactate will interfere with coordination.
- High lactate content increases the risk of injury.
- The creatine phosphate system is disrupted by high levels of lactate.
- Fat oxidation in high levels of lactic acid stagnates.

The formation of lactic acid can be known by running as far as 100 meters which produces anaerobic alactat energy system with time about 10 seconds, 400 meter which produce lactic anaerobic energy system with time about 60 seconds, to run 800 meter produce 50% aerobic and 50% anaerobic with a time range of 2 minutes, and marathon runs with a time range of about 2 hours plus that yields 98% aerobic and 2% anaerobic. Where to run 400 meters will be a way to get maximum lactic acid, with a record time of approximately one minute or about 60 seconds. In this study to increase the levels of lactic acid in the sample then the sample must perform a sprint 400 meter first. After doing sprint then sample can do recovery [4].

In this research used for active recovery is aquatic exercise method. While in recovery passiveusing sport massage method. At that time lactic acid that has been destroyed will be directed to the heart in line with the direction of blood circulation leading to the heart. In the liver lactic acid will dioxide into glucose, glucose will be brought back by blood to the muscle to be stored as energy reserves in the form of glycogen, so lactic acid will quickly descend and the body regains energy reserves from lactic acid oxidation results.

II. MATERIALS AND METHODS

The research method used is experimental method. The form of research design using "Pre-Test and Post Test Design" is the provision of pretest before treatment and post test after treatment. As for the free variable is sport massage and aquatic exercise while the dependent variable is the decrease in body lactic acid levels in the students of Ilmu Keolahragaan Study Programme at the Universitas Negeri Jakarta.

A. Participant

The population in this research is the students of Ilmu Keolahragaan Study Programme at the Universitas Negeri Jakarta, which amounts to 100 people.

Sampling technique in this research is by using purposive sampling [11]. Samples taken amounted to 20 people, with the following criteria:

- Willing to do research
- Comes at the time of research
- Aged 18-22 years.
- Have done the examination by the doctor before the exercise.
- Has no history of heart disease.
- Has no occasional seizure habit or bladder incontinence.

- Willing to follow the study voluntarily, including in following the training program of the trainer who then did experiments with sports massage and aquatic exercise.
- Willing to check lactic acid levels

Drop out criteria:

- Does not meet any of the above requirements
- Not following the lactate acid test in the final test
- Stop during exercise and irregular in doing the exercise program

B. Instrument

The instrument used to collect data in this study is to make measurements of the variables contained in this study. In this study data is taken by:

- Taking lactic acid data before performing a 400 meter sprint (as a reference on after recovery or knowing lactic acid breaks).
- Taking lactic acid data after sprint 400 meters.
- Taking lactic acid data after performing the sport massage method.
- Taking lactic acid data after performing the aquatic exercise method.

With these instruments researchers can measure the decrease of body lactic acid in students before and after doing sports massage and aquatic exercise.

III. RESULTs AND DISCUSSION

Data collection was used as research data obtained from initial and final test of lactic acid concentration in blood, based on observations of the effects of sport massage method and aquatic exercise method on decreasing lactic acid levels. The data can be described as follows.

Description of data in this study include the mean, the highest value, the lowest value, the standard deviation, the standard error mean of each variable, the following data:

TABLE I. TABLE DESCRIPTIONS OF SPORT MASSAGE EFFECTS RESULTS ON LACTIC ACID REDUCTION

Lactic Acid Level	Pre-Test	Post-Test
The highest value	12.3 mmol/L	1.1 mmol/L
The lowest value	21.1 mmol/L	1.6 mmol/L
Mean	14.75 mmol/L	1.37 mmol/L
Standart deviation	2.75	0.17
Standart error mean	0.63	0.04

The analysis result of the initial test and the final test of lactic acid content by using the recovery effect of sport massage obtained the average value (M_D) = 13.39, standard deviation (S_D) = 2.69 and standard error mean (SE_{MD}) = 0.62, t-value obtained = 21.597. Then the result is tested with t-table at degrees of freedom (dk) = n - 1 = 20 - 1 = 19 with the level of trust (α) = 0,05 obtained critical value t-table = 2.093. Thus the t-value is greater than t-table (t-value = 21.597> t-table = 2.093). With the increase of lactic acid from resting lactic acid by 75% and showed a decrease in lactic acid content by 90% by using Sport Massage.

Based on the analysis of data can be concluded null hypothesis (H_0) rejected, work hypothesis (H_1) accepted, it means effect of recovery work of massage massage can decrease lactic acid level.

TABLE II. TABLE DESCRIPTIONS OF AQUATIC EVERCISEEFFECTS ON LACTIC ACID REDUCTION.

Lactic Acid Level Pre-Test	Post-Test
The highest value11.1mmol/L	3.1mmol/L
The lowest value18.7mmol/L	5.3mmol/L
Mean 14.19mmol/L	4.42mmol/L
Standart deviation2.22	0.65
Standart error mean0.51	0.15

The result of the analysis of the initial test and the final test of lactic acid content by using the effect of aquatic exercise recovery obtained the average value (M_D) = 9.775, standard deviation (S_D) = 2.48 and standard error mean (SE_{MD}) = 0.57, the t-value obtained = 17.149. Then the result is tested with t-table at degrees of freedom (dk) = n - 1 = 20 - 1 = 19 with the level of trust (α) = 0.05 obtained critical value t-table = 2.093. Thus the t-valueis greater than t-table (t-value = 17.149> t-table = 2.093). With the increase of lactic acid from resting lactic acid by 80% and showed a decrease in lactic acid content by 68% by using Aquatic Exercise.

Based on the data analysis, it can be concluded that the null hypothesis (H_0) is rejected, the working hypothesis (H_1) is accepted, it means that the effect of aquatic exercise recovery can decrease lactic acid level.

From the final test of lactic acid levels in the recovery group of sport massage and aquatic exercise obtained standard difference between two mean (SEm_xm_y) = 0.84, t-value obtained = 4.303. Then the result of the calculation is tested with t-table at degrees of freedom (dk) = (n1 + n2) - 2 = (20 + 20) - 2 = 38, and the level of trust (α) = 0.05

obtained t-table critical value 2.021 (t-value = 4.303> t-table = 2.021).

Based on the results of the data analysis then H_0 rejected and H_1 accepted so it can be concluded that there is a significant difference between the recovery of sport massage and recovery aquatic exercise to decrease lactic acid levels where the effect of recovery sport massage work decreases lactic acid levels more than the recovery aquatic exercise on the students of Ilmu Keolahragaan Study Programme at theUniversitasNegeri Jakarta.

IV. CONCLUSIONS

Based on the problems that have been proposed and supported by theoretical description, research data obtained, and analysis of data that has been done then it can be concluded that sport massage better than aquatic exercise to decrease body lactic acid levels in students of Ilmu Keolahragaan Study Program of the Universitas Negeri Jakarta.

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Application of Safety Education on Junior High School Teaching Materials

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***Abstract*—Children in junior high school are stand in transitional period between elementary and senior high school. These junior high school students are still on the period of growth and development. Therefore, they are included as vulnerable group. They always want to move and have excessive energy, so that they have a very high risk of experiencing accident, either at school or at home. In contrast, education of safety for children in school is very minimal, either in formal education (within teaching materials, educational process, and learning facilities) or in informal education through extracurricular activities. The study design used was quantitative-descriptive with observational approach. Primary data collection was performed through Focus Group Discussion with teachers and school managers, while secondary data was obtained through documental study of teaching materials from 7th to 9th grade. The result showed that teaching materials, which contained education of safety, were 30.21% in 7th grade, 6.43% in 8th grade, and 28.13% in 9th grade. The advice given was to increase teacher competency in applied safety science, so the teachers can develop their teaching materials into the real example during teaching process. Furthermore, the teachers can integrate the education of safety on thematic subjects or extracurricular.**

Keywords—teaching materials, safety, junior high school

I. INTRODUCTION

Children of junior high school are still on the growth and development period, so they are included in vulnerable group. Their age is within the transitional age between elementary school and senior high school. In general, they are always want to move because of their excessive energy. Furthermore, they also have high curiosity related to new things around them. As the result, there are many accidents, either minor or major accidents, occur during their activities, such as during playing, exercising, crossing the road, and going home. These accidents are sometimes make a panic situation in school. Therefore, comprehensive prevention of accident in children, either through enhancement of knowledge of student, the role of teachers, school management, parents, school committee, and the others are needed [1].

Current facts show that generally all human activities are having risk of endanger the safety either themselves or others. Accidents can take place because of several factors. One of them is knowledge level of safety education in children. Limited knowledge of safety education are potentially caused either mild or serious accidents, even death. On several cases, accidents happened in children were causing serious injury and death.

School accidents data from School Health Unit (UKS) of PL. Benadus 02 in Semarang showed that the students ever experienced accidents during walking, running, or exercising. There are 9 students suffered from injuries and 5 student, who were referred to the hospital due to bone fracture and sprain after running and falling [2]. Moreover, study from Olowokere (2016) showed that in public school there are limited health care provider to fulfill the need of health service for children [3].

On the other hand, substantive formal educations on school subjects are densely given in the current curriculum. Education of safety for children in school is very minimal, either in formal education (within teaching materials, explanation from the teachers during learning activities, and owned learning facilities) or in informal education (within extracurricular activities).

A study by Widowati (2017) showed that safety education is still needed in elementary school. In the 1st grade, 60% of the educational subjects already have safety education content. In the 2nd grade, there were only 14.3% educational subjects that contain safety education, which was included on civic education subject. Meanwhile, in 3rd, 4th, 5th, and 6th grade, there were 14.3%, 90%, 100%, 87.5%, and 50% educational subjects with safety education content, respectively [4].

In order to obtain illustration of safety education in basic education level, we must start from elementary school, junior high school, to senior high school. In this study, we aimed to understand the illustration of materials and facilities of learning, which were available in junior high school.

II. MATERIALS AND METHODS

Our study used quantitative descriptive design with observational approach. This study used Focus Group Discussion (FGD) to collect primary data and documental study to collect secondary data. The FGD involved teachers and school's management. We performed the FGD to understand, theoretically and practically, the implementation of safety education for student in junior high school based on their point of view. Meanwhile, documental study was performed by reviewing the subjects of teaching materials for the 7th to 9th grade of junior high school. The secondary data was obtained to understand whether the safety education included explicitly or implicitly on the each subjects.

This study performed on only one public junior high school in Indonesia because of junior high school in Indonesia have almost similar standard, which is set by National Education Authorities in Indonesia. The data were analyzed descriptively.

III. RESULTS AND DISCUSSION

Generally, of 11 educational subjects (100%) in the 7th grade, allalready contained safety education, although it was not included in every chapter.

Three of eleven (27.3%) educational subjects in the 8th grade (social sciences, Javanese language, and Islamic education) did not contain safety education contents. Meanwhile, in the 9th grade, there were only 2 of 15 (13.3%) educational subjects (social sciences and mathematics), which did not contain safety education contents. However, in every subjects on 8th and 9th grade, which contained safety education contents, it was not included in every chapter of the subjects.

1. Analysis of safety education on teaching materials in the 7th grade

The 7th grade had 11 subjects as follows: English language, Islamic education, civic education, Indonesian language, mathematic, art and culture, Javanese language, social sciences, sport and health education, natural sciences, and workshop. They had 105 chapter and 422 theme.

From the illustration above can be concluded that in the 7th grade, civic education and social sciences had the highest percentage of safety education contents (56%). On the other hand, art and culture had the lowest percentage of safety education contents (5%).

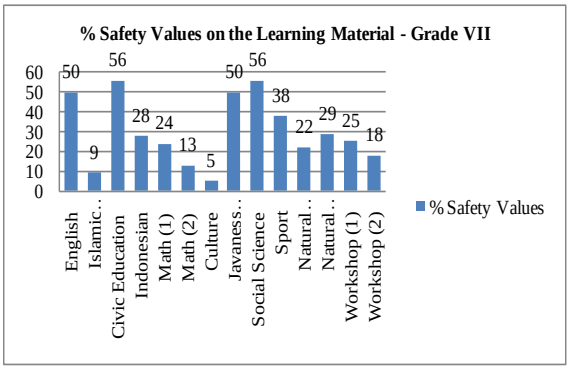

Fig. 1. Illustration of Safety Education on Teaching Materials in the 7th grade

2. Analysis of safety education on teaching materials in the 8th grade

The 8th grade had 11 subjects as follows: English language, Islamic education, Pancasila and civic education, Indonesian language, mathematic, art and culture, Javanese language, social science, sport and health education, natural science, and workshop. In total there were 112 chapters and 424 themes.

Subject of workshop had the highest percentage of safety education contents, which was 24% on the 2nd semester and 22% on the 1st semester. On the other hand, these following subjects did not contained safety education: social science, natural science on the 2nd semester, Javanese language, Islamic education, and mathematic on the 2nd semester.

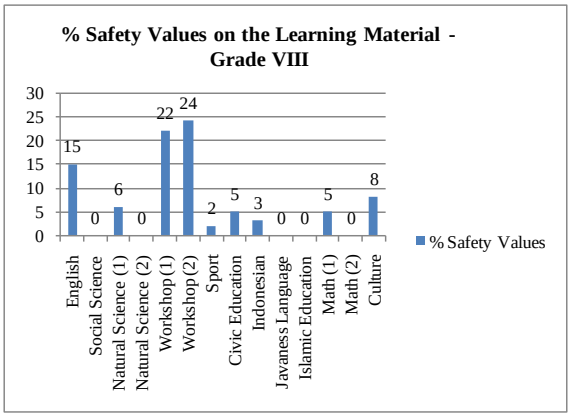

Fig. 2. Illustration of Safety Education on Teaching Materials in the 8th grade

3. Analysis of safety education on teaching materials in the 9th grade

The 9th grade had 11 subjects as follows: English language, Islamic education, civic education, Indonesian language, mathematics, art, Javanese language, social science, natural science, biology, and physic. In total there were 124 chapters and 284 themes. These subjects were supported by 15 teaching materials to prepare the student to take on national exam (UN).

Islamic education subject had the highest percentage of safety education contents (100%). On the other hand, social science and national exam enrichment material for mathematics subject had the lowest percentage (0%) (Fig. 3).

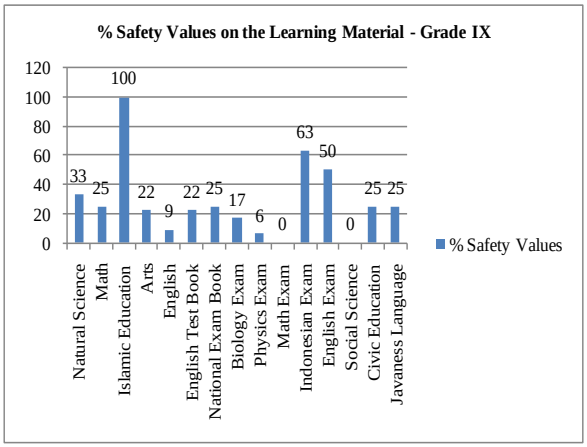

Fig. 3. Illustration of Safety Education on Teaching Materials in the 9th grade

4. Illustration of Total Safety Education in All Grades

In all grades, percentage of subjects without safety education were higher than subjects with safety education (Fig. 4). The 8th grade had the lowest percentage of subjects with safety education.

In details, among 422 themes in all subjects on the 7th grade, there were 30.21% themes with safety education. Among 424 themes in all subjects on the 8th grade, there were only 6.43% themes which have content of safety education. Furthermore, among 284 themes in all subjects on the 9th grade, there were 28.13% themes have safety education contents.

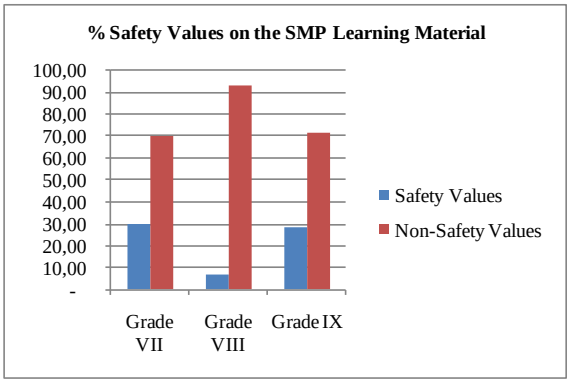

Fig. 4. General illustration of safety education on junior high school's teaching materials

5. Method of Delivering Safety Education Contents in Every Grades

Themes of subjects in all grades had the safety education content, either implicitly delivered or explicitly delivered (Fig. 5). Though, it seemed on figure shown that themes that had no contain of application of safety education was more than themes that had contain, either implicitly or explicitly delivered.

In details, among 422 themes in all subjects on the 7th grade, there were 30.21% themes with safety education and 23% of them were explicitly delivered on the teaching materials.

Among 424 themes in all subjects on the 8th grade, there were only 6.43% themes with safety education and 5% of them were explicitly delivered on the teaching materials. Moreover, among 284 themes in all subjects on the 9th grade, there were 28.13% themes with safety education and 13% of them were explicitly delivered on the teaching materials.

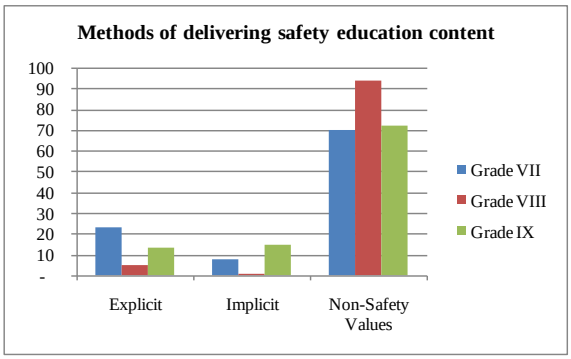

Fig. 5. General illustration of method of delivering safety education content on teaching materials

Meanwhile, FGD result showed that several subjects had safety education content, such as English language in transportation theme on the road and sport. In addition to formal education, there were safety education on extracurricular activities, such as scout and swimming. However, the teachers agreed that there were many subjects without safety education on their school. The teachers also said that they had competency to improvise and integrate the available themes of subjects into the example of applied safety education. Nevertheless, they only can give example on safety education aspect related to daily living. Therefore, majority of the teachers said that they need courses related to safety education to enhance their knowledge. Meanwhile, the teachers said that Health Care Unit room and drugs supply were below the standard. The stairs and the availability of fire extinguisher were also below the standard, especially on the laboratory.

We concluded from the illustration previously that safety education on junior high school was minimal, either on "national (Diknas)" subjects, local subjects, thematic subjects, or practical subjects on the laboratory. These findings were similar with a study by Sukarmin, which revealed that implementation of safety education by sport teacher in elementary school was only included in the category of "fair". In quality, sport teacher in elementary school already had awareness and ability to provide sport education safely,

although it was not optimal. Effort made by sport teacher in elementary school was not sufficient to reach all aspect, which were involved in sport educational process, especially non-technical aspect [5].

Meanwhile in Indonesia, safety education is very important, because Indonesia has high potential of natural disaster. According to a research by Sakurai, in 2004, 56% of elementary school in Banda Aceh were located in the area, which was prone to tsunami. Education authorities in Banda Aceh stated that, in 2014, there were 21.301 students that had potential to get the impact of tsunami. Through recovery support after disaster, the reduction of the risk of natural disaster had been performed by the external parties in Banda Aceh to improve safety in the school. The effort of reducing the risk including the reconstruction of the building with two floors, the making of evacuation route and safety sign, the training of evacuation, the preparation and development of relevant educational subjects. However, the continuity of these activities were not adequate, because of the external parties was not involving local citizens and was causing "dependency". Moreover, the head of the school did not realize that they had responsibility to ensure the continuity of these activities [6].

On the other hand, activities of children had several potential risk of danger that may threaten their safety. According to a research by Li, children still had low awareness toward the use of sanitation facility and water on hygiene practice, including washing hands before eating. There were many students that walk on the cross road, which is not safety for children, either because of no available traffic signs or uneven grounds. These condition might put the children in danger, either while playing or being outside the classroom [7].

Similar result also found by Yusvita. There were 40-50% of students, who were capable of identified the potential danger and the risk of several potential of danger around them, such as stairs can cause falling, slippery floor can cause slipping and injury, motor vehicle can cause traffic accident, and non-hygienic food or environment can cause disease. In addition, not all students capable of re-explaining about safety sign in school, including traffic sign [8].

There were many students, who were not capable of using practical tools according to the procedure, even after proper explanation by the teacher. Furthermore, there were students, who did not keep their practical tools in the right place. As the result, these tools had potential of broken or can cause accident.

Therefore, massive, holistic, and comprehensive safety education is needed to ensure the safety of the children, considering them as the next generation of the country. Education is the process of learning that can enhance the ability of the children, either cognitive, affective, or psychomotor. These model of education also can be applied in the field of safety. In order to help student achieve success in learning, the curriculum about safety education in school is needed.

In order to change the perception and paradigm of the citizens about safety, the safety education and its continued socialization must be performed. These program must be performed since the early age to grow the sense of discipline. Therefore, the value of safety can be adopted to applied daily value, such as discipline in traffic, safely crossing road, and the others [9].

The example of safety education is the one that applied in Malaysia. They arrange the system of safety in school laboratory using 5P approach as follows: (1) working procedure, (2) safety tools, (3) experimental control, (4) chemical waste disposal, and (5) emergency procedure. This approach is a comprehensive way for the students, teachers, or laboratory assistant to implement safety values while working on the laboratory. It is considered sufficient in preventing non-desirable event in school, which was highly reported and inviting the concern of all parties [10].

IV. CLOSING

The conclusion of current study is: Generally, 11 educational subjects (100%) in the 7th grade already contained safety education, although it was not included in every chapter. These subjects were as follows: English language, Islamic education, civic education, Indonesian language, mathematic, art and culture, Javanese language, social sciences, sport and health education, natural sciences, and workshop. They had 105 chapter and 422 theme. There were 30.21% themes with safety education and 23% of them were delivered explicitly on the teaching materials.

Three of eleven (27.3%) educational subjects in the 8th grade did not contain safety education contents. These subjects were social science, Javanese language, and Islamic education. The 8th grade had 11 subjects as follows: English language, Islamic education, Pancasila and civic education, Indonesian language, mathematic, art and culture, Javanese language, social science, sport and health education, natural science, and workshop. They had 112 chapters and 424 themes. There was only 6.43% of the subjects, which contained safety education, and 5% of them were delivered explicitly on the teaching materials.

In the 9th grade, there were only 2 of 15 (13.3%) educational subjects (social sciences and mathematics for national examination), which did not contain safety education. The 9th grade had 11 subjects as follows: English language, Islamic education, civic education, Indonesian language, mathematics, art, Javanese language, social science, natural science, biology, and physic. They had 124 chapters and 284 themes. These subjects were supported by 15 teaching materials to prepare the student to take on national examination. Among 284 themes in all subjects on the 9th grade, there were 28.13% themes with safety education and 13% of them were delivered explicitly on the teaching materials.

According to the conclusion, we would like to give these following advice: teacher competency in applied science of safety must be enhanced. Therefore, the teacher can improve or develop the theory into the real example of implementation of safety education during the teaching process, especially in the subject that did not contain the safety education, such as social science, mathematics, Javanese language, and Islamic education. Moreover, teachers are expected to deliver the safety education in details to the students in the subjects that related to laboratory activities, thematic subjects, and local content subjects. Also, they are also expected to be able to integrate safety education into extracurricular activities in school.

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Radiographic Evaluation of Odontogenic Keratocyst: A 14-year Retrospective Study

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***Abstract*—Odontogenic keratocyst is regarded as a relatively common developmental odontogenic lesion representing 12% to 14% of all odontogenic cyst of the jaw. The lesion is of important interest for its potentially destructive behaviour and relatively high recurrence rate from 21.1% to as high as 35.4% in patients associated with Nevoid basal cell carcinoma syndrome. This study aim to determine the radiographic characteristic of odontogenic keratocyst (OKC) using conventional radiographs and cone beam computed tomography images. Patients histopathologically diagnosed as OKC from 2003 to 2016 by Oral and Maxillofacial Pathology Department were retrospectively reviewed. Radiographs of these cases from the archives of the Department of Oral and Maxillofacial Radiology, Faculty of Dentistry Mahidol University were retrieved. Assessment of the location, shape, border, cortication, locularity, relationship of lesion to embedded tooth, displacement of adjacent tooth, root resorption and bony expansion of the lesion were conducted. Radiographs of 89 patients with the mean age of 31.5 years old were analysed. A total of 100 OKCs were studied. The most common location was at the ramus of mandible followed by posterior maxilla. Most cases presented as a well-defined unilocular radiolucency with smooth and corticated border. The lesions were in association with embedded tooth in 42 lesions. The lesions might relate to an embedded tooth by surrounding an entire tooth, attached to the CEJ level or extending to part of root. Bony expansion and teeth displacement could be found and root resorption were not common. These features facilitate in guiding the clinicians to formulate the differential diagnosis.**

Keywords—odontogenic keratocyst, keratocystic odontogenic tumor, radiographic features

I. INTRODUCTION

Odontogenic keratocyst (OKC) was first introduced by Philipsen in 1956 and was formerly known as keratocystic odontogenic tumor [1]. This lesion has been recently reassigned as a cystic lesion in the 4th edition of the World Health Organization Classification of Head and Neck Tumours [2]. OKC is define as "An odontogenic cyst characterized by a thin, regular lining of parakeratinized stratified squamous epithelium with palisading hyperchromatic basal cells [3]. General consensus concurred that OKC derived from the remnants of dental lamina although some researchers suggested the possibility of this lesion arising from extension of basal cells of overlying the oral epithelium [4]. OKC has been gaining particular interest due to its aggressive nature and recurrence potential particularly in lesions occurring in the tooth bearing area [5, 6].

As the third most common cyst of the jaw, OKC represents 10% to 20% of odontogenic cyst affecting a wide age group but mainly prevalence in the second and third decade of life [4, 5, 7]. This lesion is slightly more predominant in male and most commonly found in the posterior region of the mandible [6, 8]. The majority of OKC cases occurred as a solitary lesion. Multiple lesions are frequently associated with nevoid basal cell carcinoma syndrome (NBCCS) [4, 9]. Clinically, most patients presented with an asymptomatic slow growing swelling and less common with pain and discharge on the affected site [5, 6, 10].

The aim of this study is to determine the radiographic characteristic of all OKC cases using conventional radiographs and cone beam computed tomography (CBCT) images.

II. MATERIAL AND METHODS

Cases histopathologically diagnosed as OKC from 2003 to 2016 by Oral and Maxillofacial Pathology Department, Mahidol University were retrospectively reviewed. Radiographs of these cases from the archives of the Department of Oral and Maxillofacial Radiology, Faculty of Dentistry Mahidol University were retrieved. There was a total of 100 OKC in 89 cases, of which six cases exhibited multiple lesions. Demographic data such as age and gender were collected while radiographic features were analysed. Cases were excluded if severe artefacts were found on the radiographs that could interfere with radiographic interpretation.

The location of the cyst was established by dividing the maxilla into left and right sides with two anatomic regions on each side which are the anterior (from midline to distal surface of canine) or posterior (from mesial of canine to maxillary

tuberosity). Lesions in the mandible were divided into left and right sides and further dividing into three segments; anterior (from midline to the distal surface of canine), posterior (from mesial of premolar to the angle of mandible) and ramus (extending from the angle to the sigmoid notch).

Assessment of the shape, border, cortication, locularity, relationship of lesion to embedded tooth, displacement of adjacent tooth, root resorption and bony expansion of the lesion were conducted. The lesions were classified as unilocular or multilocular depending on the presence of at least one septum separating the lesion.

Descriptive statistics were used to analyze the radiographic features of OKC in order to determine the frequency and percentage.

III. RESULTS AND DISCUSSION

A. *Patients Demographic*

This study consists of total number of 89 cases with 43 (48.3%) of the patients were males and 46 (51.7%) were females. The ratio of male to female patients were 1:1.07 showing almost equal gender predilection. The age of patients at the time of presentation ranged from 10 to 87 years old, with the mean age of 31.5 years. Patients in the second and third decades were most commonly affected (54 out of 89, 60.7%).

B. *Radiographic Features*

Anatomic locations

From 100 lesions, 59 OKCs were identified in the mandible and 41 presented in the maxilla as shown in Table 1. The ramus of the mandible was found to be the most commonly affected region in this series (32 lesions) followed by the posterior maxilla (29 lesions). Five lesions in maxilla and five lesions in mandible crossing the midline were observed.

TABLE I. THE DISTRIBUTION OF OKC ACCORDING TO LOCATION

Location	Right	Left	Crossing midline	Total number of lesions
Anterior maxilla	7	0	5	12
Posterior maxilla	15	14	0	29
Anterior mandible	2	0	5	7
Posterior mandible	12	8	0	20
Ramus	20	12	0	32
Total	56	34	10	100

Radigraphic appearance

Eighty-three OKCs were presented as unilocular and 17 lesions were multilocular. The unilocular:multilocular ratio of all OKCs was 4.8:1. Those lesions affecting the maxilla were predominantly unilocular lesions (36 out of 41 lesions). Most of the multilocular OKCs were found in the posterior mandible (11/17 multilocular lesions). One multilocular OKC located at the anterior maxilla, two at posterior maxilla and three lesions at the anterior mandible. Fifty-nine lesions presented with a smooth border while 41 OKCs exhibited scalloped border.

Association with embedded tooth

Forty-two OKCs were associated with an embedded tooth. Unerupted third molar was the most embedded tooth associated with the lesion (37/42; 88%). Among the cases associated with the embedded tooth, the lesion attached to the tooth at the cementoenamel junction (CEJ) in 17/42 (40.4%), and OKCs enveloping the entire tooth in 16/42 (38.1%) and beyond the CEJ in 9/42 (21.4%).

Effect on surrounding structures

Bony expansion in the buccal, lingual or palatal aspect was detected in 45 lesions from a total number of 70 OKCs that were justifiable for the assessment of cortical enlargement. The majority of OKCs associated with bony expansion were located at the posterior maxilla and ramus of the mandible (33/45 lesion; 73%). Teeth displacement were found in 30 OKCs while root resorption was noted in six OKCs, mostly involving lesions in the mandible.

Cone beam computed tomography evaluation

A total number of 30 cases incorporated CBCT imaging, involving 18 lesions in the maxilla and 12 OKCs in the mandible. Seventeen out of 18 lesions in the upper jaw involved the posterior aspect of the maxilla while nine out of twelve mandibular OKCs displayed lesion extension to the ramus region. According to the three-dimensional assessment, 25 out of 30 lesions portrayed bony expansion. In exception of one lesion located in the anterior segment of the maxilla, all lesions raised the floor of the affected maxillary sinus and invade into the maxillary antrum. From the examination of the mandibular lesion, three OKCs exhibit inferior displacement of the mandibular canal and five lesions eroded the cortical border of the mandibular canal. In both jaws, nine OKCs displayed cortical perforation in multiple planes. Interestingly upon CBCT images observation, one maxillary OKC was discovered to contain a few irregular shaped calcified foci, while one mandibular lesion appeared to exhibit a lamellar periosteal bone formation.

Multiple lessions associated with nevoid basal cell carcinoma syndrome patients

The present study includes five patients associated with NBCCS presented with multiple OKCs ranging from two to four lesions located in multiple quadrants. Fifteen OKCs

were found and the most lesions were located at the posterior region of the maxilla and mandible (12/15 lesions). Twelve lesions presented with a smooth and unilocular appearance while only three lesions showed a scalloped and multilocular features.

In this study, the age ranged from 10 to 87 years old similar to previous report [6]. The mean age recorded in our population was 31.5 years old, in consistent with previous studies [8, 11]. The highest frequency of cases affected patients in the second and third decades in agreement with existing researches [7, 12]. In this study, OKC showed no gender predominance with the ratio of 1:1.07 in contrast to previous researches that reported a male predominance [13, 14].

Radiographically, in consistent with previous studies, OKC was found in a higher number in the mandible than the maxilla [13, 16]. In the present study, 83% of lesions were unilocular while 17% were multilocular with the ratio of 4.8:1, almost similar to a previous study [16]. Forty one percent of OKCs presented with scalloped border involving all 17 multilocular lesions. Although most OKCs presented as a completely radiolucent lesion, this study identified one lesion containing radiopaque foci and one OKC with high density areas within the maxillary sinus which were detected on CBCT images. This might be dystrophic calcification that occurred within a long establish cyst [17].

In this study, 42% of OKCs associated with embedded tooth which is a higher occurrence compared to those reported by Chirapathomsakul et al that noted a slightly lower percentage of 31.3%. The majority of the involved teeth were the third molars, comprising 37 out of 42 (88%) of all lesions which is supported by previous studies [8, 10, 18, 19]. In this study, these 42 lesions were further classified according to the lesion attachments, 40.4% of OKCs were found attached to the CEJ, 38.1% covering part of the root and 21.4% enveloping the entire tooth. OKC may be mistaken as a dentigerous cyst (DC) if it envelope the crown of unerupted tooth. However, in DC the lesion most frequently found attached at the CEJ level [16]. Hence, if a radiolucent lesion is found to envelope an entire unerupted tooth or attach at the level below the CEJ, it may have a higher chance to be an OKC.

The characteristic growth pattern of OKC along the confinement of the cortical boundary until it reaches a considerably large size to cause a noticeable buccal expansion is well recognized [17]. However, in this study, more than half of OKCs presented bony expansion particularly at the posterior maxilla and ramus of the mandible and this is in consistent with a previous study [8]. In a study [11], OKC caused more displacement of impacted third molar in mesio-distal compared to ameloblastoma and DC. In this study, 30% of OKCs found to cause tooth displacement. Only six OKC displayed root resorption in this series which is slightly higher than other reports [6, 10].

CBCT images were prescribed for 30 lesions in the present studies. All lesions affecting the posterior maxilla raised the cortical floor of the maxillary sinus and further invaded into the affected sinus similar to a finding in a study by Gumusok et al [20]. On CBCT images, displacement and erosion of the cortex of inferior alveolar canal can be found in consistent with a study reported by Gamba et al [21]. Two OKCs involving the maxillary sinus displayed high density areas that were undetected in panoramic radiograph. These high-density areas seen on CBCT images might be the desquamated keratin content that occasionally increase the radiographic attenuation in CT images [22].

OKC may appear as the first presentation of NBCCS [23]. According to this study, five cases showed multiple OKCs and associated with NBCCS from the total of 89 cases (5.6%). This showed higher occurrence than a previous study [5]. In this study, the syndromic patients age ranged from 10 to 37 years involving three males and two females with the number of lesions varied from two to four lesions. We found that 10 out of 15 OKCs (67%) located in the maxilla in contrast to a finding by Khaliq et al that recorded 77% of syndromic lesions located in the mandible. Regarding the periphery and locularity, 80% of OKCs in syndromic cases displayed smooth border with unilocular presentation in consistent with existing study [23].

IV. CONCLUSION

Within the limitation of this retrospective study, the radiographic features of OKC is in consistent with the previous reports as they were predominantly found at the posterior segment of the mandible and presented as a well-defined unilocular radiolucent lesion. OKC may appear with a smooth or scalloped border and may associate with embedded tooth, particularly the impacted third molar. Upon examination of the relation of OKC with unerupted tooth, attachment at the CEJ and encapsulate the entire tooth were almost equally found. The least presentation showed the lesion attached to the part of root below CEJ. Bony expansion and teeth displacement might be common, while root resorption was considered a rare occurrence

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Procalcitonin in Children with Relapsing Steroid-Sensitivenephrotic Syndrome

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***Abstract*—Sensitive-Steroid Nephrotic Syndrome (SSNS) is the most common chronic glomerular disease in children with high incidence of relapse. Infections were statistically significant risk factors for recurrence in SSNS. Current findings suggest that procalcitonin (PCT) may not only be a valid marker for infection and inflammation but also a pro-inflammatory cytokine-like mediator. To identify the relationship betweenprocalcitonin and relapse in childhood SSNS. A cross-sectional study was conducted from February 2017 to February 2018. Complete blood count, procalcitonin, and urinalysiswere obtained. Data wasanalyzed by *chi-square* test with P-value <0.05 considered significant. Of all 55 samples, the percentage of relapsing SSNS in this study is 72.7%. On Receiver Operating Characteristic(ROC) curve, the total Area Under Curve (AUC) was 73.6% with P = 0.007. There was a statistically significant correlation between procalcitonin level cut off 0.065 ng / dL with relapse occurrence (P value = 0.002), with a prevalence ratio of8.308 (CI :95% range: 1.993-34.636). Procalcitonin with cut off value > 0.065 ng / dl gave the best accuracy (70.9%), which predicted relapse with sensitivity 67.5%, specificity 80%. The occurrence of relapsingnephrotic syndrome is influenced only with procalcitonin in this study.**

Keywords—procalcitonin, minimal change nephropathy, steroid-sensitive nephrotic syndrome, children, relapse

I. INTRODUCTION

Nephrotic syndrome (NS) is the most common chronic glomerular disease in children. The incidence of NS is 2-7 per 100.000 children per year and the prevalence is 12-16 per 100.000 children [1]. The incidence in Indonesia is reported 6 per 100.000 per year. The ratio of boys to girls is 2:1 [2]. Most cases of children with NS (90%) are idiopathic NS [3]. The causes include minimal change disease (85%), mesangial proliferation (5%), and focal segmental glomerulosclerosis (10%) [4].

Patients with minimal change disease mostly show a response to corticosteroid treatment.[4]Sensitive-Steroid Nephrotic Syndrome (SSNS)is the most common form of childhood NS and responds to corticosteroid therapy. However 80-90% cases will relapse so steroidtherapy will be repeated [5]. Patients with SSNS receive frequent steroids due to recurrent relapse, whereas steroid-resistant nephrotic syndrome receives fewer recurrent doses due to steroid-sparing agent use. Based on the course of their illness, 76 to 93% patients with SNSS will experience relapse, 30% of them will have frequent relapse, 10-20% will have infrequent relapse, while the remaining 40-50% will have steroid-dependent nephrotic syndrome (SDNS) [6]. There have been several studies published on long-term outcomes of children with SNSS. The study reported by long-term remission was observed in over 90% of children with minimal NS abnormalities, so the SSNS was considered a benign disorder with an excellent prognosis [7]. However, recent studies have shown that 33-42% of children experience relapse into adolescence and adulthood [8]. This may be associated with increased complications in children so as to increase mortality and morbidity.

The response of steroid therapy during initial therapy, hematuria and infection was statistically significant as a risk factor for recurrence in nephrotic syndrome [9]. Procalcitonin (PCT) serum is a very accurate and specific marker of infection in patients with normal renal function [10]. Recent studies show that PCT does not serves only as a valid infection marker but also as a mediator of proinflammatory cytokines [19]. The combination of C-reactive proteins and PCT can be used to evaluate infections in SSNS patients and predict the incidence of relapse [11]. However studies associated with procalcitonin as infection markers and relapse risk factors in SSNS is still very limited. This study aims to

determine the relationship between PCT as a risk factor for relapse in children with SSNS in RSUP Haji Adam Malik Medan.

II. MATERIALS AND METHODS

This is a cross sectional study conducted in RSUP Haji Adam Malik Medan North Sumatera from February 2017 to February 2018. Target population is children aged 1 to 18 years. Accessible population is target population diagnosed with NS. Sample is an accessible population that meets the inclusion and exclusion criteria. Samples were taken on a consecutive basis where patients with SSNS were examined for PCT when they visitoutpatient clinic.

Inclusion criteria:

- Children aged 1 - 18 years who have been diagnosed with SSNS in RSUP Haji Adam Malik Medan and visit nephrology outpatient clinic for control on third day and are in remission or relapse phase with or without infection or infection history

Exclusion criteria:

- Patients with steroid-resistant NS
- Patients with congenital NS
- Patients who refused informed consent

Parents/guardians and children with SN who visit nephrology outpatient clinicthat meet the inclusion criteria are given explanations and informed consent which states agree to follow this research. When patients with SSNSvisit the outpatient clinic, data collection of age, gender and blood sampling for complete blood examination, PCT and urinalysis examination was performed. Patients were identified as SN Relapse or Non Relapse. Data collected in the analysis by comparing age, sex, PCT, leukocyte, neutrophil/lymphocyte ratio. This study was approved by the Research Ethics Committee of Medical School of University of Sumatera Utara.

2.1 Variables and Operational Definition

The independent variables in this study were age, type, sex, PCT, leukocyte, neutrophil/lymphocyte ratio while the dependent variable was nephrotic syndrome. Nephrotic syndrome is a clinical condition characterized by symptoms such as severe protein> 40mg /hour/m^2, protein /creatinin ratio> 0.2 gram/mmol, hypoalbuminemia<2.5 g/dL, hyperlipidemia with total cholesterol 170-200 mg/dL. Steroid-sensitive nephrotic syndrome is a patient who achieves complete remission with steroid therapy for four weeks.

Non relapse (Remission) is a negative proteinuria or trace (proteinuria <4 mg/m^2 LPB/hour) for 3 consecutive days in 1 week. Relapse is proteinuria ≥ 2+ (proteinuria> 40 mg/m^2 LPB/hour) for 3 consecutive days within 1 week. Procalcitonin level is the value of PCT serum taken when the patient visit outpatient clinic RSHAM. Neutrophils/Lymphocyte ratio is a marker (biomarker of infection) in which a ratio increase (cut off>10) indicates a diagnosis of bacteremia. Leukocytes are a haematological parameter as a marker of infection.

2.2 Data analysis

Collected data is processed, analyzed, and presented using software, SPSS 15.0. The data is presented as simple data of the number or percentage using chi-squared test. To test the statistically significant differences between different parameters, the number and percentage of probability values were used. P-value <0.05 is considered significant.

III. RESULTS AND DISCUSSION

In this study, there are 55 samples that fulfill the inclusion criteria.

TABLE I. CHARACTERISTICS OF SUBJECTS

Characteristics	N=55
Mean age, year (SD)	9.8 (4.03)
Sex, n (%) Male Female	 36 (65.5) 19 (34.5)
Mena leukocyte / µL (SD)	12 320.5 (5 597.46)
Mean neutrophil, % (SD)	62.8 (15.38)
Lymphocyte rate,% (SD)	28.5 (13.18)
Mean procalcitonin, ng/mL (SD)	6.4 (36.78)
Relapsing nephrotic syndrome, n (%)	
Relapse Non relapse	40 (72,7) 15 (27.3)

Most subjects in this study were male (65.5%). The percentage of relapse NS in this study is quite high (72.7%). To determine the level of PCT as a relapse predictor in children with NS, an analysis of the ROC curve was performed. The total area under the curve was 73.6% with *P* = 0.007.

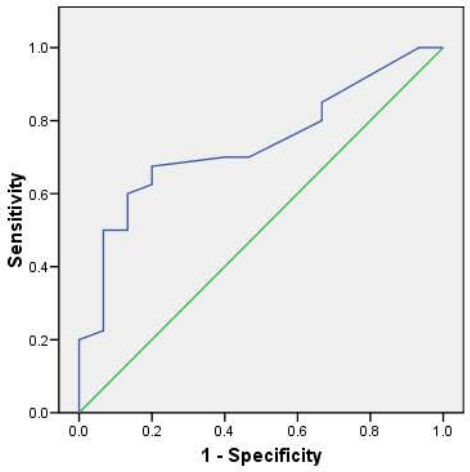

Fig. 1. Procalcitonin ROC curve levels in predicting the occurrence of relapse

Chi-squared test was used to determine the association betweenserumPCT level and relapse occurrence of SSNS. Procalcitoninlevels used as cut off were the highest sensitivity and specificity (0.065 ng/dL), the highest sensitivity but low specificity (0.025 ng/dL), and the highest specificity but low sensitivity (0.195 ng/dL).

Procalcitonin level with cut off value>0.065 ng/dl gave the best accuracy (70.9%), which predicted relapse with sensitivity67.5%, specificity 80%, positive predictive value 90%, negative predictive value 48%, positive likehood ratio 3.4 , negative likelihood ratio 0.5.

TABLE II. ACCURACY OF PCT LEVELS TO PREDICT RELAPSE IN PATIENTS WITH SSNS

Cut off PCT	Sensi-tivity	Spesi-ficity	PPV	NPV	PLR	NLR	Accu-racy
>0,025	85%	33,3%	77,3%	45,5%	1,27	0,45	70,9%
>0,065	67,5%	80%	90%	48%	3,4	0,4	70,9%
>0,195	50%	93,3%	95,2%	41,2%	7,46	0,5	61,8%

There was a statistically significant correlation between PCT level cut off 0.065 ng / dL with relapse occurrence (P value = 0.002) using Chi-squaredtest. The prevalence ratio of 8.308 (95% CI = 1.993-34.636) indicates that children with SSNS who have PCT level greater than or equal to 0.065 ng / dL have a risk of relapse 8.308 times compared with children who have less PCT level from 0.065 ng / dL.

TABLE III. RELATIONSHIP BETWEEN PCT LEVEL AND RELAPSE OCCURANCE

Procalci-tonin level (ng/dL)	SSNS		*P**	PR	CI 95%
	Relapse (%)	Non Relapse (%)			
≥0.065	27 (67.5)	3 (20,0)	0.002	8.308	1.993-34.636
<0.065	13 (32.5)	12 (80.0)			

Risk factors of relapse occurrence in children with NS in this study were analyzed using logistic regression test. Based on these tests, the occurrence of relapse in NS is not influenced by demographic factors and is associated only with PCT levels.

TABLE IV. RISK FACTORS OF RELAPSE OCCURENCE

Risk Factors	Constant	Wald	*P**
Age	0.909	1.016	0.615
Sex	0.676	0.253	0.615
N/L ratio	-	0.001	0.999
Leukocyte	3.846	2.481	0.115
Procalcitonin	8.737	7.892	0.005

* Logistic regression test

The test showed that children withNS who had PCT levels greater than or equal to 0.065 had a risk of relapse 8.737 times compared with children with PCT less than 0.065 (*P = 0.005*).

Idiopathic NS in children is most often caused by minimal change nephroticsyndrome (MCNS) and has a high relapse rate with almost 50% of children being a steroid-dependent NS [13]. Function on T cells causes the release of certain cytokines, which cause changes in glomerular permeability and led to relapse [12].

Most samples in this study were male (65.5%). The percentage of relapsingNS in this study is quite high (72.7%). Although there was no statistically significant relationship between sex and the occurrence of relapse in children with NS (P = 0.452). This study has the same results as the study conducted in united states [1].

The study found that relapses were mainly found in male sex, with a male to femal ratio was 1.5:1. The total sample size was 80 people with relapse occurrence of 228 and the majority of patients with relapse frequency were 62 (77.5%). Mean age of study subjects was 1-16 years with an average age of 7.47 years [1]. Retrospective studies based on medical record found that most relapsed patients are often <5 years old [14]. While in this study had an average age of 9.8 years and incidence relapse more frequently at age above 9.8 years.

Infection is a major cause of morbidity and mortality in childhood NSand one of the risk factors for relapse [15, 16]. An estimated 52-70% of relapse in developing country children is mainly followed by upper respiratory tract infections, other common infections include skin infections such as impetigo and cellulitis, acute gastroenteritis or dysentery, urinary tract infections and primary peritonitis [9, 23]. Age, sex, history of atopy, race, history of hematuria, presence of respiratory infections as comorbidities and days required for remission is a significant risk factor for the occurrence of steroid-dependent nephrotic syndrome [15, 17]. However, in this study there is no specific discussion of the basic infection that triggers the occurrence of relapse, history of atopy, race, history of hematuri and there are no significant relationship was found between sex and age with relapse in this study.

Mean of leukocyte, neutrophil, and lymphocyte value in this study was 12.320,5/µL, 62.8%and 8.5%, respectively. There was no statistically significant association between neutrophil/lymphocyte ratio and the relapse occurrence of NS (P = 0.275). This is different in previous research results, leukocytes have a significant difference in frequentrelapsing nephrotic syndrome compared with SSNS [18]. Neutrophil values were higher ($p < 0.05$) while the lymphocyte values were lower ($p < 0.05$) in patiente with relapse nephrotic syndrome. However, no mention of the ratio between neutrophils / lymphocytes in the study [18].

Study related to PCT as an infection marker and risk factor of relapse in SSNS is still very limited. A pilot study found the role of PCT in differentiating relapse of minimal change nephrotic syndrome (MCNS) with poteinuria related infections in children, have noted sensitivity x specificity in relapse and infection-related status for PCT was 0.472 and 0.628, respectively and for CRP is 0.183 and 0.762, respectively [20]. The optimal cut-off value of PCTto predict relapse or proteinuria caused by infection by the ROC test in this study was 0.385 with a sensitivity of 96.2% specificity of 49.1% [11].

In this study found levels of cut off lower than previous studies. Procalcitonin levels used as cut off were PCT level with the highest sensitivity and specificity (cut off =0.065 ng/dL, sensitivity 67.5%, specificity 80%). Based on chi-squared test, there was a statistically significant correlation between PCT level cut off 0.065 ng/ dL with relapse occurrence (P value = 0.002). The prevalence ratio of 8.308 (95%CI = 1.993-34.636) indicates that children with SSNS who have PCT levels greater than or equal to 0.065 ng/dL have a relapse risk of 8,308 times compared with children who have less PCT level from 0.065 ng/dL.

Procalcitonin is a specific bacterial infection marker compared to C-Reactive Protein (CRP) and estimated sedimentation rate (ESR) [22]. The normal level of serum procalcinonin is <0.05 ng / mL. The value of ≥0.5-2 is noted to have a tendency for systemic bacterial infection (Chaudhury,2013). While as mentioned earlier infection is a risk factor for relapse [16]. Procalcitonin levels can be detected within 3-4 hours and within 6-24 hours reaching the highest levels means earlier than CRP and ESR [8, 22]. Cut off value in our study was lower than previous study with total AUCobtained 73.6% with P value = 0.007. This study is limited to discussing procalcitonin levels in children with relapsed nephrotic syndrome without comparing with other marker levels such as CRP and ESR.

This study has limitations where the study is a cross-sectional design and specifically does not address specific infections that trigger relapse. In addition, the study did not compare other infection markers such as CRP and ESR as did previous pilot studies. However, this study is the first study to examine the relationship between procalcitonin levels and relapses in pediatric patients with NS in Haji Adam Malik Hospital.

IV. CONCLUSION

The mean age of children who participated in the study was 9.8 years. The occurrence of relapse was higher in children over 9.8 years old. Most of the samples in this study were male. Relapse events in boys higher than girls, PCT level > 0.065 ng/dL could be used to predict relapse. There was no statistically significant correlation between age, sex, neutrophil/lymphocyte ratio, leukocytes with relapse SSNS incidence in this study.

Cohort study with a larger sample size is expected to provide more detailed and accurate results about the role of PCT in the occurrence of relapse/proteinuria in NS associated with the incidence of infection.

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Effectiveness of Food Safety Awareness Program to Build Early Childhood Development

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***Abstract*—The objectives of this study was to determine the change of mother's behavior after given intervention related to food safety in early childhood. The study design was before and after experimental design. The sample were 62 mothers. Intervention with educational model through film media related with food safety aspects. The instrument was a questionnaire. Data analysis using t-test. The results showed that there was a significant change. It can be concluded that there is an improvement in mother's behavior after being given intervention.**

Keywords— food safety awareness, education model, behavior change

I. INTRODUCTION

To enhance the physical development of children according to his age that needed the proper nutrition and food safety to be consumed by the child. The World Health Organization (WHO) emphasizes that food safety is an act to ensure all foods are safe for consumption [1]. In this case, it includes how to protect kids from choking hazards [2]. According to WHO, there are 1.5 billion cases of diarrhea worldwide (except in China), estimated at 70% relating to food consumption and a related 1.8 million deaths in children under the age of five [1].

In Indonesia, more than 40% of foodborne diseases are in children under five years [3]. In line with data cases of foodborne illness in early childhood children at kindergarten and preschool located in Petompon area in 2017 showed that 167 cases of influenza, 3 cases of vomiting and diarrhea and 2 cases of inflammation. Foodborne disease cases occur from exposures outside the home and home. Currently, research in Indonesia still focuses on food prepared outside of the home, while relating to food safety in home is still limited.

The factors influencing food safety are pollution caused by microorganisms such as bacteria, chemicals in food on certain food processing, and physical contaminants include dirt, hair, nail polish flakes, insects, broken glass, nails, staples, plastic,dust, flies. In under developed countries, food poisoning is caused by unhygienic conditions, lack of hygiene education, drought, contaminated water, improper food storage conditions, pesticide residues, dirty environment and improperly maintained [4].

Based on the above statement, food safety related to knowledge and behavior. The results of a 2000 Home Food Safety Study conducted by Audits Internationals that food safety mistakes are caused by 40% lack of knowledge, 40% lack of awareness and 20% lack of motivation [5]. In addition, the results of research by [6] indicate that knowledge and practice of food safety in housewives in Yogyakarta city is low. A recent review also implicates a lack of food preparation knowledge as barriers to prepare home cooked-meals [7]. The Health Belief Model also supports the above research results. This theory suggests that knowledge influences trust to vulnerability and severity of disease, benefits and barriers to practicing preventive health behaviors, and self-efficacy [8].

In many families, mothers have main responsibility for feeding children[9]. The child will learn to observe from the mother and putting knowledge into practice to prevent unsafe food [5].

The effort to increase food safety awareness for mother is educational methods. This methods aim for understanding and changing behavior. Educational methods which effectively to coach the mothers are film and discussion. The methods are more effective in giving awareness to change the behavior[10]. Based on an example or model, a person receives knowledge about the proper behavior as well as a guide in behaving [11]. Behavior is defined as everything that a person does or says. Behavior can be attributed to activities, actions, performance, responses, responses and reactions. Technically, behavior is related to muscle function, gland, human body electrical activity [12]. In this case the behavior is all the practices done by someone in the form of words and actions. Characteristics of behavior that can be measured through behavioral dimensions are frequency and duration [12].In addition, the habits can be formed after 66 days[13].

II. MATERIALS AND METHODS

Characteristics of the population in this study were mothers with children aged 3-5 years in Petompon, Semarang, Indonesia. The sampling technique is the judgmental or purposive sampling technique that is taken based on the need to achieve the purpose of this research [14, 15]. As the sample of this study is 168 mothers of 3-5 year old children who are currently following the activities studying in Aisyiyah Preschool, ABA Kindergarten and Pembina Preschool and Kindergarten. The qualified sample in the end of the research or follow the instruction and response the questionnaires properly before and after intervention are 62 mothers.

This study uses before and after experimental design [14, 15]. In this study, maternal behavioral issues related to food safety were intervened with food safety awareness as an educational model. It has several aspects of food safety messages using film and booklet. The film is viewed once at beginning research, while booklet is distributed to mother to take home. It aims to remind the food safety messages. After film viewing, the participants are facilitated to discuss about the messages. In the end of intervention, it can be measured and observed the impacts through behavior changes. The questionnaire has been tested reliability and validity. The aspects of questionnaire include how to keep the hands clean, how to keep tableware and cutlery and kitchen clean, food preparation and food handling, how to avoid the food that contain toxic additives, and how to prevent choking. The scale of questionnaire refers to the components of behavior, they are frequency and duration. Frequency refers to how many behaviors occur in a period. While the duration refers to how long the behavior occurs in certain periods [12]. Data analysis using paired sample t test to test the hypothesis of two samples in numerical data (interval or ratio)

III. RESULTS AND DISCUSSION

TABLE I. CHARACTERISTIC OF RESPONDENT

Characteristic	Variable	Respondent	Percentage
Maternal status	House wife	24	39%
	Working mother	37	61%
Food handler in household	Mother	50	81%
	Grandmother	5	8%
	Spouse	3	5%
	Household assistant	4	6%

Respondent characteristic data showed the most maternal status were working mother (61%) and majority of food handler was mother (81%) and the others are 8% of grandmother, 5% were spouse/husband and household assistant (6%).

TABLE II. STATISTICAL TEST RESULT

Food Safety Behavior	Mean	Sd
Before	53	3.4
After	54	2.7
t-test score value	0,000	

By Wilcoxon signed rank test, the result indicated that mean respondents behavior before intervention were 53 and after intervention were 54 with p value 0.000.

Based on the analysis of questionnaire data, the descriptions of respondents behavior in several aspects revealed :1) the behavior to prevent chocking achieve 100%, 2) the behavior to keep tableware and cutlery and kitchen clean were 90%, 3) the behavior to avoid the food that contain toxic additives were 90%, 4) the behavior to prepare and handle the food were 70% and 5) 65% of the behavior to keep hands clean.

Health promotion can be delivered through various mass media, both print and electronic media. Each media has its advantages and disadvantages, that the proper media selection in order to get maximum results is needed [16]. The results showed the effectiveness of the Food Safety Awareness Program model using the selected film media is customized to the mother of preschool and kindergarten students. Increased behavior in terms of food safety management after intervention and statistics illustrate that there are any differences before and after intervention, and the model is effective.Although a person's or society's behavior on health is determined by many factors, such as knowledge, attitudes, beliefs, traditions, education, the economic or social level, but the effort in providing health promotion is a basic effort that must be considered. Besides, the availability of facilities, attitudes and behavior of health workers will also support and strengthen the formation of a behavior or action[17].

It is expected that the educational media through film can encourage the improvement of mother's behavior toward food safety.The effectiveness of a film as an educational media can be realized depends on the elements of the film itself and choosing the right strategy in message delivery. In addition, in the delivery of films, it should be noted also how a facilitator needs to deliver the advantages if the action is done. Educational media can raise awareness for the mother about the importance of providing safe and hygienic food for children according to minimize disease. Mothers can practice the examples to manage and provide food safety for children. In line with recent research, that the film is proved in promoting positive behavior effectively[10]. This is also substantiated by other research that film is more effective to increase the practices in child care [18].

In the discussion, there are many questions from the participants and mainly related with food preparation and food handling. In this activity, the participants can discuss and gain an adequate knowledge related to food safety. In accordance with the results of the study that 36% of food handlers do not have an adequate knowledge about hygienic and food safety. Sources of information are generally obtained by friends, mass media, parents, health supervisors, and training [19]. However sources of information by from friends, mass media and parents tend to be less accurate than by health supervisors and training. Hence, food safety awareness program is important to be given to all mothers

The results of this study also show that 90% of mothers (working mother 61% or housewife 31%) keep play a role in food preparation and food handling for children, and the others are grandmother, father and household assistant. This is due to the fact that the most of mothers have understood to their role to pay attention for children health. It is in line with the statement that the first function of the mother is to provide physical care for the child, mainly in feeding of children[20].

The mothers could focus their attention during the right stages of early childhood.It is a period marked by rapid physical and neurological development and vulnerability to health risks. In addition, the children are also in a very sensitive condition to the stimulus so that they are easily guided, directed, and inculcated good and bad habits. Collaboration between parents and school institutions can be utilized for community empowerment. It can foster independence community. This is according to the results of the research that empowerment can be droved by parents, communities and institutions [21].

This study showed that the main problem of food safety is on the aspect of keeping hands clean. Our research is concern in how hand washing behavior is appropriate. It includes how hand washing behavior and the length of time used to wash hands. Food handler requires to wash their hands to inhibit microorganisms before touching the food. Other research found that handwashing before preparing food is a particularly important opportunity to prevent childhood diarrhea, and that handwashing with water alone can significantly reduce childhood diarrhea[22]. Hand washing effectively reduces the spread of infectious diseases by bacteria, parasites and viruses [23].

IV. CONCLUSION

This study found that there were differences before and after Food Safety Program intervention model. There are improvement better that this model has an effective value. Respondents have understood its role in food management and its importance in managing food to be safe from bacteria and other pollution. Consistency in carrying out food safety practices is important in daily life. In addition, the results support on the hypothesis that the provision of food safety education plays a role in improving the mother's efforts in adopting the behavior as food handler. Its potentially reduce the risk factors and incidence of foodborne diseases. This food safety message is not only important for parents to know and apply, but also for children. Therefore, mother should also transmit the principles of food safety in children with discussion and behavioral examples. Because mothers have a great influence in educating children and are generally closer to children. The child adopts the shared values and behavioral type of the mother

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Relationship between Enuresis and Children's Quality of Life

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***Abstract*—Enuresis had been reported affecting children in many aspects of life such as physosocial, emotion and school performance which leads to Quality of Life (QoL) impairment. This study aims to assess the relationship between enuresis and children's quality of life. A cross-sectional study was performed in children between the age 5 to 18 years at Muara Batang Gadis, North Sumatera in April 2016. Enuresis was examined using questionnaire International Association for Child and Adolescent Psychiatry and Allied Professions (IACAPAP) and the measurement quality of life using Pediatric Quality of Life Inventory (PedsQL) Generic Core Scales 4.0 version. Data was considered significant if p < 0.05. There was a significant difference in emotion segment of QoL in 13-18 yo enuretic children compared to healthy children and significant differences in PedsQL total score and emotion segment by age group in enuresis children.**

Keywords—Enuresis, quality of life, children

I. INTRODUCTION

Enuresis is a common urinary problem in pediatric nephrology unit [1]. Children over 5-year old should be able to control their void at night while they were sleeping. Based on the International Children Continence Society (ICCS), enuresis is defined as episode of children unable to control their voids while they were sleeping after they reached 5 year-old [2]. The prevalence of enuresis varies from epidemiological studies from 3.8% to 25% depending on the age of the patient and the terminology used. The prevalence of enuresis in 5 year-old was 15 - 25% and decreased with increasing age. Many studies reported that the cause of enuresis was multifactorial factors [3].

Enuresis is also a problem that frequently found in pediatrics psychiatry departement, which mostly affected children's live and their families in many aspects including psychological function [4]. According to population-based studies, it had been reported that enuresis could be the source of shame and influenced children's social life, self image and their daily life within their families and these data are reported to be significant [5, 6].

Prolonged enuresis will impact several aspects of the child's life such as psychosocial, emotion, behavior and school performance, which lead to quality of life impairment [5]. The aim of this study is to assess the difference of enuresis children's Quality of Life (QoL) compared to healthy children in 5 – 18 year old.

II. MATERIAL AND METHODS

This study was a cross sectional study to analyze the difference quality of life between enuresis children and healthy children. This study had been conducted in Singkuang Village, Batang Gadis, Mandailing Natal regency, North Sumatera province in April 2016. The target population were children aged 5-18 years, sample was chosen consecutively. The inclusion criteria is children aged 5 - 18 years who attended school at the time study conducted. The sample selection was conducted at Kindergarten, Primary and Secondary Schools in Singkuang Village. All samples were asked for approval from parents after an explanation about how the examination to be performed. Only those who volunteered were enrolled in the study. Children with cerebral palsy, chronic diseases such as tuberculosis, diabetes mellitus, heart disease, lupus erythematosus, asthma, malignancy which could affect quality of life were excluded from analysis.

The dependent variable in this study is PedsQL score while enuresis as independent variable. Enuresis defined based on ICCS definition which is an episode of children unable to control their voids while they were sleeping after they reached 5 year-old. Healthy child is child who has no physical, mental, emotional and social problems.

Demographic data was collected from samples and they performed physical examination, anthropometry examination, urine analysis and tested for blood sugar level. Enuresis evaluated based on International Association for Child and Adolescent Psychiatry and Allied Professions (IACAPAP) questionnaire and all samples fit the criteria of enuresis assessed their quality of life by using PedsQL

Generic Core Scales version 4.0. The report includes reports of children and parents in children aged 5-7 years, 8 -12 years, 13 – 18 years. The PedsQL scaled between 0 and 100, 100 = never a problem; 75 = almost never; 50 = sometimes; 25 = almost always; and 0 = always. Higher value indicates better quality of life.

The collected data was processed and analyzed using statistical computer software. Data was presented as mean and standard deviation. The difference in quality of life between enuresis and healthy children was analyzed using the Mann-Whitney statistical test. While differences in quality of life in enuresis children between age groups using Kruskal Walis test. The results considered to be significant if the p value <0.05.

III. RESULTS AND DISCUSSION

The study was conducted in Singkuang Village, Muara Batang Gadis District, Mandailing Natal Regency, North Sumatera province.

TABLE I. SAMPLE CHARACTERISTICS

Characteristics	Enuresis (n = 54)	Healthy child (n = 54)
Sex, n (%)		
- Boys	35 (64.8)	34 (63.0)
- Girls	19 (35.2)	20 (37.0)
Age, years (SD)	9.4 (2.51)	10.3 (2.42)
Age group according PedsQL		
- 5 – 7 year-old	13 (24.0)	12 (22.2)
- 8 – 12 year-old	33 (61.2)	31 (57.4)
- 13 – 18 year-old	8 (14.8)	11 (20.4)
Number of Sibling (SD)	3.4 (2.15)	3.7 (1.94)
Sibling enuresis history, n (%)		
Yes	18 (33.3)	8 (14.8)
No	36 (66.7)	46 (85.2)
Paternal enuresis history, n (%)		
Yes	11 (20,4)	4 (7,4)
No	43 (79.6)	50 (92.6)
Maternal enuresis history n (%)		
Yes	8 (14,8)	3 (5,6)
No	46 (85.2)	51 (94.4)
Paternal education level, n (%)		
Primary school	42 (77.8)	40 (74.0)
Junior High school	4 (7.4)	3 (5.6)
Senior High school	8 (14.8)	11 (20.4)
Maternal education level, n (%)		
Primary school	46 (85.2)	45 (83.3)
Junior high school	4 (7.4)	4 (7.4)
Senior high school	1 (1.9)	3 (5.6)
Diploma	1 (1.9)	1 (1.9)
Bachelor	2 (3.7)	1 (1.9)
Father's earning, n (%)		
- <Rp. 500k	3 (5.6)	3 (5.6)
- Rp. 500k- Rp.1.000k	23 (42.6)	26 (48.1)
- Rp. 1.000k – Rp.3.000k	23 (42.6)	20 (37.0)
- >Rp. 3.000k	5 (9.2)	5 (9.3)
Mother's earning, n (%)		
- <Rp. 500k	33 (6.1)	39 (72.2)
- Rp. 500k- Rp.1.000k	13 (24.1)	10 (18.5)
- Rp. 1.000k- Rp.3.000k	5 (9.3)	4 (7.4)
- >Rp.3.000k	3 (5.6)	1 (1.9)

The total of patients enrolled in this study were 54 enuresis children and 54 healthy children. Male sex predominates in both groups. The mean age in the enuresis group was 9.4 years with standard deviation 2.51 and in the healthy group 10.3 years with standard deviation 2.42.

Each group was divided into 3 age groups based on the reporting of the PedsQL questionnaire, 5 – 7 years, 8-12 year, and 13 - 18 years. The family history of enuresis was found in the enuresis group consisted of a history of enuresis in siblings were 18 (33.3%), fathers 11 (20.4%) and mothers 8 (14.8%) people. In healthy children group the history of enuresis in siblings were 8 (14.8%) people, fathers 4(7.4%) people and mothers 3 (5.6%) people. Fathers' incomes in the healthy children group ranged between Rp. 500.000 to Rp.1.000.000, while in enuresis group Rp. 500.000-1.000.000 and Rp. 1.000.000 to Rp. 3.000.000 have the same amount. (Table.I)

The result of a quality of life evaluation using PedsQL version 4.0 Generic Core Scales on enuresis groups and healthy children presented in Table 4.2. The statistical test used was Mann-Whitney test. The results of calculations obtained in the age group 5-7 years, and 8-12 years found no difference in quality of life both on the physical, emotional, social, school performance based on child reports and parent reports. While for the age range 13-18 years showed the difference in the quality of life of the emotional function (p <0.05) both the parent and child report was significant compared with the healthy child group. While the physical, social, school performance and overall value of PedsQL total did not show significant differences with healthy child groups (Table II).

Table III. shows the differences in PedsQL score in enuresis children by comparing the age-group using Kruskal Wallis test. There was a significant difference in the emotional function of both child and parent reports (p <0.05). While the total value of PedsQL also shows a significant difference but only in the child report and not on the parent's.

Enuresis is the most common urinary problem of childhood outbreaks [1]. Based on the International Children's Continent Society (ICCS) an enuresis is defined as an episode of the child unable to restrain his or her urine during sleep at night after a 5-year-old child [2]. Prevalence of enuresis varies across countries. Unalacak et al in Turkey say the prevalence of 8.9% enuresis of which 7.75% is the primary nocturnal enuresis [7]. In China the prevalence rate is 4.7% and in Ethiopia is reported at 5% in small towns and 9% in large cities [8, 9]. The prevalence of enuresis in Indonesia was 10.9% [10].

Some research results reveal that in enuresis children often have psychological and behavioral problems compared with non-enuresis children especially on internalization and externalization issues and this is more prevalent in children with diurnal enuresis.

TABLE II. PEDSQL SCORES IN ENURESIS AND HEALTHY CHILDREN

PedsQL Score	Enuresis		Healthy child		
	n	PedsQL Score (SD)	n	PedsQL Score (SD)	*p*
5-7 year-old	13		12		
Child's report					
Physical health		98.05(2.74)		98.43(2.85)	0.800
Emotion		86.54(3.15)		87.50(4.52)	0.760
Social		88.85(4.16)		89.17(3.59)	1.000
School performance		84.62(4.31)		85.00(4.26)	0.960
Total score		89.51(2.39)		90.02(2.41)	0.880
Parent's report					
Physical health		99.26(1.40)		98.93(1.58)	0.720
Emotion function		87.31(3.30)		86.25(2.26)	0.520
Social function		89.62(2.47)		88.33(2.46)	0.360
School performance		83.84(4.63)		82.50(2.61)	0.680
Total score		90.00(2.19)		89.00(1.04)	0.160
8-12 year-old	33		31		
Child's report					
Physical health		98.27(2.84)		98.41(1.60)	0.480
Emotion function		84.85(2.64)		85.00(4.28)	0.960
Social function		88.64(3.81)		89.35(2.81)	0.560
School performance		83.48(3.18)		84.03(3.75)	0.480
Total score		88.82(1.53)		89.19(1.80)	0.480
Parent's report					
Physical health		98.74(1.77)		99.28(1.36)	0.200
Emotion function		85.30(1.74)		85.64(3.09)	0.600
Social function		88.64(3.59)		89.35(3.09)	0.360
School performance		83.48(3.19)		82.74(4.80)	0.320
Total score		89.08(1.28)		89.25(1.86)	0.960
13-18 year-old	8		11		
Child's report					
Physical health		99.20(1.48)		98.55(2.18)	0.800
Emotion function		80.00(3.78)		85.91(3.01)	0.001
Social function		88.75(4.43)		88.18(3.37)	0.640
School performance		82.50(2.67)		85.00(3.87)	0.200
Total score		87.61(1.26)		89.41(1.62)	0.800
Parent's report					
Physical health		99.20(1.48)		98.26(2.18)	0.480
Emotion function		83.13(2.59)		84.55(2.70)	0.360
Social function		91.25(5.17)		88.63(3.23)	0.160
School performance		83.13(4.38)		85.45(4.16)	0.320
Total score		89.18(1.94)		89.23(1.75)	0.904

- Mann Whitney test

TABLE III. PEDSQL SCORES IN ENURESIS BY AGE GROUP

	N	CHILD'S REPORT PEDSQL	*P*	PARENT'S REPORT PEDSQL	*P*
Physical health					
5 -7 year-old	13	98.05(2.74)		99.26(1.40)	
8 -12 year-old	33	98.27(2.84)	0.672	98.74(1.77)	0.598
13-18 year-old	8	99.20(1.48)		99.20(1.48)	
Emotion function					
5 -7 year-old	13	86.54(3.15)		87.31(3.30)	
8 -12 year-old	33	84.85(2.64)	0.001	85.30(1.74)	0.001
13-18 year-old	8	80.00(3.78)		83.13(2.59)	
Social function					
5 -7 year-old	13	88.85(4.16)		89.62(2.47)	
8 -12 year-old	33	88.64(3.81)	0.959	88.64(3.59)	0.100
13-18 year-old	8	88.75(5.17)		91.25(5.17)	
School performance					
5 -7 year-old	13	84.62(4.31)		83.84(4.63)	
8 -12 year-old	33	83.48(3.18)	0.504	83.48(3.19)	0.858
13-18 year-old	8	82.50(2.67)		83.13(4.38)	
PedsQL Total					
5 -7 year-old	13	89.51(2.39)		90.00(2.19)	
8 -12 year-old	33	88.81(1.53)	0.028	89.08(1.28)	0.489
13-18 year-old	8	87.61(1.26)		89.18(1.94)	

Although some studies have assessed the psychopathological aspects of enuresis, it remains unclear whether enuresis children have different personality characteristics than their peers [11, 12, 13]. Most studies have concluded that enuresis has an influence on the quality of life of children in various aspects of life, either emotional aspects, psychosocial or influential on school achievement index [13, 14].

This study is a cross-sectional study that assesses the difference in quality of life in enuresis and healthy children, each group involving 54 children. The quality of life analysis in this study used PedsQL Generic Core Scales version 4.0 based on age group 5-7 years, 8-12 years and 13 -18 years. Each age group each had a total PedsQL score of 89.51 (2.39), 88.82 (1.53) and 87.61 (1.26), respectively, in accordance with the PedsQL child's values in general. Based on the research of Varni et al in 2002 the total value of child's quality of life in general is 81,38 ± 15,9 [15, 16].

In this study mostly samples came from low socioeconomic status and parental education levels mostly are primary school graduates. Family enuresis history in this study showed that in enuresis children was found that they have enuresis history in both sibling and their parents higher dan healthy children. In many previous studies reported than psychosocial and environmental factors play an important role as the cause of enuresis, including low socioeconomic status, large number of families, unemployed fathers, densely populated and inadequate housing. The existence of adaptation to new family members as well as parents separation is also known to have an effect on the occurrence of [17, 18]. Family factors are closely related to the occurrence of enuresis and are thought to have genetically inherited indications. Children whose parents have a history of nearly three quarters of enuresis will experience enuresis [6, 20]. Children will have 40% enuresis risk when one parent experiences enuresis and 70% if both parents experience enuresis. Previous studies have written 32% of fathers and 23.9% of mothers with enuresis children had a history of enuresis when they were children [6, 21].

The significant difference of PedsQL value of children enuresis and healthy children is statistically only seen in emotional function in 13-18 years age group from child reporting. While the physical, psychosocial and school performance of children and parents report did not show different results as well as the overall value of PedsQL.

In this study also conducted statistical tests comparing PedsQL values in children enuresis between age groups and found that there is a significant difference in the quality of life of the emotional function both in reporting children and parents. As for the total PedsQL value is only meaningful on the reporting result of the child.

In contrast to two previous studies by Kilicoglu et al., And Oktay et al. Both of which also used the generic PedsQL version 4.0 as a measure of the quality of life in enuresis children compared with the control group, there was

a significant difference in all quality of life functions [4, 14]. Naitoh et al in Japan using KINDL instrument to compare child enuresis with controls found that enuresis same as other chronic diseases that give negative effect to HRQoL [21]. While study conducted by Ertan et al who also use KINDL measuring instrument showed results similar to our results that is not shows a significant difference in the total value of quality of life but has a negative correlation on the confidence subscale [22]. This difference may be due to a smaller sample size than previous studies by Kilicoglu et al with larger samples. While discrepancies in parental reporting results with child reporting may be attributed to parental PedsQL reports that mostly show greater value than child reports. Many of the parents assume that enuresis is a natural thing and will lose itself with age.

The limitation of this study is the small number of samples so that no correlation can be measured between the age of the enuresis children and the quality of life.

IV. CONCLUSION

There is relationship between enuresis and quality of life of children compared to healthy children, there was a significant difference in the quality of life of emotional function in 13-18 year age group. While the value of PedsQL in enuresis children when compared between age groups found significant differences in total PedsQL value and emotional function.

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Relationship between Bilingual Environment and Indonesian Language Development in Children

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Abstract*—Language development is one of the most important developments in children, influenced by internal and external factors. One of the most influential external factors is verbal environment. Specific language disorder can occur in one language in children with bilingual environment in the first three years of life. A cross sectional study to assess relationship between bilingual environment and Indonesian language development in children was conducted in early childhood education programs in Medan, Indonesia from November 2017 to March 2018. All sample were recruited with consecutive sampling method. Physical and hearing examination were performed. Language development were examined with Cognitive Adaptive Test/ Clinical Linguistic Auditory Milestone Scale (CAT/CLAMS). Fisher's exact test was used to assess relationship between bilingual environment and Indonesian language development. There was 9.1% children with Indonesia language development disorder in bilingual group, whereas none in non bilingual group. There was significant relationship between bilingual environment and Indonesian language development in children.

Keywords*—bilingual environment, Indonesian language development, children

I. INTRODUCTION

To enhance the physical development of children according to his age that needed the proper nutrition and food safety to be consumed by the child. The World Health Organization (WHO) emphasizes that food safety is an act to ensure all foods are safe for consumption [1]. In this case, it includes how to protect kids from choking hazards [2]. According to WHO, there are 1.5 billion cases of diarrhea worldwide (except in China), estimated at 70% relating to food consumption and a related 1.8 million deaths in children under the age of five [1].

In Indonesia, more than 40% of foodborne diseases are in children under five years [3]. In line with data cases of foodborne illness in early childhood children at kindergarten and preschool located in Petompon area in 2017 showed that 167 cases of influenza, 3 cases of vomiting and diarrhea and 2 cases of inflammation. Foodborne disease cases occur from exposures outside the home and home. Currently, research in Indonesia still focuses on food prepared outside of the home, while relating to food safety in home is still limited.

The factors influencing food safety are pollution caused by microorganisms such as bacteria, chemicals in food on certain food processing, and physical contaminants include dirt, hair, nail polish flakes, insects, broken glass, nails, staples, plastic,dust, flies. In under developed countries, food poisoning is caused by unhygienic conditions, lack of hygiene education, drought, contaminated water, improper food storage conditions, pesticide residues, dirty environment and improperly maintained [4].

Based on the above statement, food safety related to knowledge and behavior. The results of a 2000 Home Food Safety Study conducted by Audits Internationals that food safety mistakes are caused by 40% lack of knowledge, 40% lack of awareness and 20% lack of motivation [5]. In addition, the results of research by [6] indicate that knowledge and practice of food safety in housewives in Yogyakarta city is low. A recent review also implicates a lack of food preparation knowledge as barriers to prepare home cooked-meals [7]. The Health Belief Model also supports the above research results. This theory suggests that knowledge influences trust to vulnerability and severity of disease, benefits and barriers to practicing preventive health behaviors, and self-efficacy [8].

In many families, mothers have main responsibility for feeding children[9]. The child will learn to observe from the mother and putting knowledge into practice to prevent unsafe food [5].

The effort to increase food safety awareness for mother is educational methods. This methods aim for understanding and changing behavior. Educational methods which effectively to coach the mothers are film and discussion. The methods are more effective in giving awareness to change the behavior[10]. Based on an example or model, a person receives knowledge about the proper behavior as well as a guide in behaving [11]. Behavior is defined as everything that a person does or says. Behavior can be attributed to activities, actions, performance, responses, responses and reactions. Technically, behavior is related to muscle function, gland, human body electrical activity [12]. In this case the behavior is all the practices done by someone in the form of words and actions. Characteristics of behavior that can be measured through behavioral

dimensions are frequency and duration [12].In addition, the habits can be formed after 66 days[13].

II. MATERIALS AND METHODS

This study is a cross-sectional study of two populations to assess the bilingual environment relationship and Indonesian language development in 18 – 36 months age children. This study was conducted in bilingual playgroup and Early Childhood Education institutions in Medan, Indonesia on November 2017 – March 2018. Target population are children aged 18 – 36 months in Medan. Sample is target population that meets the inclusion criteria chosen by consecutive sampling, divided into two groups, bilingual environment and non bilingual environment group (50 children each group). The inclusion criteria in this study are 18 – 36 months age children lived in Medan, born full term with birth weight ≥ 2500 grams. The exclusion criteria in this study are: 18 – 36 month age children who have cognitive and perceptual disorders, brain development disorders, hearing impairment, family and history of developmental language disorders. Consent was requested from parents after an explanation of the procedure. This study was approved by the Research Ethics Committee of the Faculty of Medicine, Universitas Sumatera Utara.

A. Variables and Operational Definition

The dependent variable is Indonesian language development, while the independent variable is the bilingual environment with the confounding variables are television exposure, the number of children in the family and maternal education level.

- The child is said to be in a bilingual environment when exposed to two languages from birth or use two languages in daily life, where one of those languages is Indonesian.
- Indonesian language development was assessed with cognitive Adaptive Test/Clinical Linguistic Auditory Milestone Scale (CAT/CLAMS). Indonesia language development disorder was declared if DQ CLAMS ≤ 85 and DQ CAT > 85 from CAT/CLAMS assessment.
- Television exposure is the total amount of time children spend watching television per day. The total amount of time is divided into ≤ 2 hours per day and > 2 hours per day, regardless of the type and name of the television program.
- Number of children is the number of living children living with the family. Categorized into two groups, ie small family (<3 children) and large family (≥ 3 children).
- Maternal education is the length of mothers receiving formal education, from elementary school to university. Categorized into three levels, ie low education level if only ever get a formal education for 6 - 11 years, moderate education level when getting a formal education for 12-13 years, high education level if getting formal education for 14 years or more.

B. Procedures

Explanation of the research objectives, the research flow, and the examination was given to the parents of the research sample. All samples were divided into two groups: bilingual environment group and non-bilingual environment group. Anamnesis was performed to obtain initial data of identity ie name, age / date of birth, sex, address and telephone number that can be contacted, name of parent / guardian, language used in daily life, birth history, family history of developmental disorder, the number of children, the total time of television exposure in children and the maternal education level. Physical examination, assessment of nutritional status and neurological examination were performed. The assessment of hearing impairment was performed with Tes Daya Dengar (TDD) instrument. The presence or absence of cognitive impairment in children was assessed by using Caput Scales Cognitive Adaptive Test (CAT). Followed by an assessment of language skills by using Clinical Linguistic Auditory Milestone Scale (CLAMS).

C. Data Analysis

Data analysis using fisher's exact test to see whether there is a relationship between bilingual environment and Indonesian language development. The relationship between dependent variable with the other confounding variables was also analyzed by using the fisher's exact test. The relationship of language development with bilingual environment and other confounding variables is expressed in the value of Prevalence Ratio (PR) with significance level $p < 0.05$.

III. RESULTS AND DISCUSSION

TABLE I. SAMPLE CHARACTERISTICS

Characteristics	Bilingual Environment	
	Yes ***(n=55)***	***No*** ***(n=55)***
Gender, n(%)		
Boy	28 (50.9)	27 (49.1)
Girl	27 (49.1)	28 (50.9)
Body weight (kg)		
Interval	12 – 16	12 – 16.8
Mean	13.9	14
Median	14	14
Body height (cm)		
Interval	85 – 104	85 – 105
Mean	95.1	95.3
Median	95	95
Age (months)		
Range	24 – 36	30 – 36
Mean	33	33.3
Median	32	36
Maternal education level, n(%)		
Moderate	18 (32.7)	20 (36.3)
High	37 (67.2)	35 (63.6)
Number of children, n(%)		
Small family (< 3 children)	49 (89.1)	48 (87.2)
Large family (≥ 3 children)	6 (10.9)	7 (12.7)
Television exposure, n(%)		
≤ 2 hours	33 (60)	26 (47.3)
> 2 hours	22 (40)	29 (52.7)

A Total sample of 110 18 – 36 month age children, divided into two groups: bilingual and non-bilingual environment, 55 children in bilingual environment group and 55 children in non-bilingual environment group. Characteristics of all sample are listed on Table 1.

In this study there was no difference between DQ CAT and DQ CLAMS values in children in bilingual environment and children in non-bilingual environment (table 2), there are none of children with cognitive impairment based on the DQ CAT values.

Table 3 is a bivariate test (fisher's exact test) between Indonesian language development and bilingual environment. The independent variable, bilingual environment has relationship with Indonesian language development as dependent variable. There was 9.1% of children with Indonesia language development disorder in bilingual group, otherwise there is none in non-bilingual environment group, with $p < 0.05$.

TABLE II. COMPARISON OF DQ CAT AND DQ CLAMS VALUES BETWEEN GROUPS

Paramateres	Bilingual environment		*P*
	Yes (n=55)	*No (n=55)*	
DQ CAT[a]	99.4 (86 – 117.14)	99.4 (88 – 117.14)	0.31
DQ CLAMS[b]	102.04 (SD ± 11.68)	103.87(SD ± 9.29)	0.36

[a.] Data was not normally distributed (median (min – max))
[b.] Data was normally distributed (mean ± SD)

TABLE III. BIVARIATE ANALYSIS (*FISHER'S EXACT*) BETWEEN BILINGUAL ENVIRONMENT AND INDONESIA LANGUAGE DEVELOPMENT

Variable	Indonesian language development		P	PR	95% CI
	Normal	Disorder			
Bilingual environment (n %)					
Yes	50 (90.9)	5(9.1)	0.03[a]	1.1	1.01 – 1.20
No	55 (100)	0 (0)			

[a.] Statistically significant (P < 0.05)

TABLE IV. BIVARIATE ANALYSIS (UJI *FISHER'S EXACT*) BETWEEN INDONESIA LANGUAGE DEVELOPMENT AND CONFOUNDING VARIABLES

Variables	Indonesia language development		*P*	PR (95% CI)
	Normal (n=50)	Disorder (n=5)		
Television exposure, n(%)				
≤ 2 hours	33 (100)	0 (0)	0.08	0.77 (0.61 – 0.97)
> 2 hours	17 (77.3)	5 (22.7)		
Number of children, n(%)				
Small family (< 3 children)	45 (91.8)	4 (8.2)	0.45	2.04 (0.27 – 15.4)
Large family (≥ 3 children)	5 (83.3)	1 (16.7)		
Maternal education level, n(%)				
Moderate	18 (100)	0 (0)	0.12	1.15 (1.01 – 1.31)
High	32 (86.4)	5 (13.6)		

Table 4 is a bivariate test (fisher's exact test) between confounding variables ie television exposure, number of children and education level of mothers with dependent variable Indonesian language development. There was no statistically significant relationship between the dependent variable and confounding variables

Language is an important part of life. With the language of one individual with another individual will be interconnected through the process of language [6]. Bilingual environment issues need to be considered in the linguistic process used by a society. The experience of two or more languages at an early age is different from the experience of one language [2].

The identification of two languages simultaneously to the child is called simultaneous bilingual, where the child is introduced in two languages from birth so that the child can master both languages simultaneously. Children who learn a second language after beginning to master the first language are called sequential bilinguals, where children usually learn from interactions with native speakers of the language that exist in the surrounding community or by teachers at school [7-9]. The study was conducted in several Early Childhood Education institutions that are bilingual based and not bilingual based. All children enrolled in bilingual-based early childhood institutions in this study were bilingual sequential children.

The study of relationship between bilingual environment and children is distinguished over the period before 1960 and after 1960. Studies of the period prior to 1960 tend to argue that bilingual environment negatively affect cognitive and intelligence, whereas post-1960 studies show bilingual environment overcome monolingual appearances in both cognitive and in academic performance [2]. In this study, there was no significant difference between cognitive in children with bilingual environment and children with monolingual environment (p 0.31). It was shown from the DQ CAT of each group, where for the bilingual environment DQ CAT = 99.4 (86 - 117.14) and for the monolingual environment DQ CAT = 99.4 (88 – 117.14).

Language developmental disorders in children with a bilingual environment occur similarly in children with a monolingual environment. In a 1997 US study of 7% of children with bilingual environment experienced impaired language development [5]. This suggests that the bilingual environment does not necessarily cause language development disorders, but is also influenced by other factors that also affect children in the monolingual environment [3,5]. From this study, the prevalence of children experiencing Indonesia language development disorder in bilingual environment was 9.1%, whereas none in non-bilingual environment.

A systematic review comparing language development in bilingual and monolingual groups in which one language is English derives different results. Three studies showed a negative bilingual environmental impact on the development of English as a second language compared with monolingual children, three studies showed no differences in language development, three studies showed a negative impact only on one language, and one study showed a positive impact on the development of the child's language by bilingual environment [4]. The first study of bilingual Spanish - English children aged

3 - 4 years in the United States in 2008 showed the use of disturbed English consonants compared to monolingual children [10]. The second study compares the phonemic development of language between British monolingual children, Spanish and bilingual Spanish-British monolinguals. Children in Spanish-English bilingual environments have phonemic language development disturbance compared to children with a monolingual environment for each language [11]. The third study in 2010 comparing children to Spanish-British bilingual environments, British monolinguals and Spanish monolinguals aged 3 - 4 years showed a lower level of English accuracy in bilingual groups [12].

This is similar to our result, where in the bilingual environment there are children who experience developmental disorders of the Indonesian language based on the results of screening screening of Indonesian language development CAT / CLAMS. In this study, the possibility of Indonesia language disorder in bilingual environment 1.1 times greater than non bilingual environment (p 0.03).

The bilingual environment as one of the environmental factors that influence the development of language also interacts with other factors, namely the level of mother education, the number of children in the family, and television exposure [2]. In this study, other factors have no significant relationship with Indonesia language development in children with bilingual environment. Our results showed that in bilingual environment group, children with large family (number of children ≥ 3) have 2.04 times greater risk than children with small family (number of children <3) for developing Indonesia language disorder (p 0.45). This is different from previous studies in the United States of 2012, where it is said that large family (number of children ≥ 3) can significantly decrease the receptive language of the child (p 0.02) [13].

Previous study has shown that maternal education has a significant relationship with the development of language in children, where mothers with high and middle education tend to have children with more vocabulary [13]. The language ability of parents with a high level of education will be different from lower levels of education, so it will be more suitable as a linguistic model in children. In this study, we only found moderate and high maternal education level in both groups of children [14,15]. It is inversely proportional to previous study, high maternal education level becomes a risk factor for the development of Indonesia language disorder in children with bilingual environment. Bilingual children with mothers who have a high education level 1.15 times for developing Indonesia language disorder compared with mothers who have moderate education level (p 0.12).

Watching television in children under three is a factor that makes children more as passive listeners. In a certain period of time, the brain should get a lot of stimulation from the environment for providing feedback, but because the more stimulation is the television, the development of brain cells that play role in language and speech will be hampered [16]. In this study there was no statistically significant relationship between television exposure and Indonesian language development in children with bilingual environment (p 0.08). But from the data, all children with Indonesian language development disorder in bilingual environment has television exposure > 2 hours per-day. Television exposure ≤ 2 hours is a protective factor which is children in bilingual environment with television exposure ≤ 2 hours have 1.3 times lower risk for having Indonesian language development disorder. This supports previous studies, where in children younger than two years with high television exposure will experience delays in expressive language. Similarly, children younger than one year with high television exposure and no companions have a significant risk of having language delays. The American Academy of Pediatrics (AAP) recommends that children watch television for no more than two hours per day, especially for children under two years of age [16,17].

IV. CONCLUSION

There is a significant relationship between bilingual environment and Indonesian language development in children, but there is no significant relationship between television exposure, the number of children and the maternal education level with the Indonesia language development in children

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