The Effects of Addition of Physical Activity Beyond Physical Education Learning Toward the Level of Physical Fitness

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Abstract—The purpose of this study was to determine the Effect of Addition of Physical Activity 2 Times a Week Through Self-Assignment Outside of Physical education learning Against the Level of Physical Fitness in students of SMAN 3 Banjarmasin. The method used in this study is the Experimental method, namely pre-Experimental Designs in the form of The One Group Pretest and Posttest Design, with a population of 565 people and a sample of 34 people. The instrument used to measure physical fitness as reflected by VO2max is to use a multistage fitness test (MFT) or Bleep Test, Nurhasan, (2007: 201). The sampling technique used in this study is a purposive sampling technique, which is a sampling technique with certain considerations, Sugiyono (2014: 126). The results of the statistical analysis with the t-test obtained Sig. (2-tailed) = 0.000 <0.05 thus the t-count was significant. Because the t-test is significant, the null hypothesis (Ho) is accepted stating that there is a difference between the initial test and the final test by providing additional physical activity twice a week through independent assignments outside of learning Physical education against Physical Fitness Levels at SMAN 3 Banjarmasin students. Conclusion: There is an effect of adding Physical Activity 2 times a week through independent assignments outside of learning, Physical education to improve Physical Fitness in students of SMAN 3 Banjarmasin.

Keywords: physical fitness, addition to physical activity

I. INTRODUCTION

Physical fitness is very important for everyone because physical fitness is the ability of one's body to perform daily tasks and work without causing significant fatigue so that the body still has a stash of energy to overcome the added burden. In a fit condition, of course, the activities carried out will be better, including school-age children. Therefore through Physical education is expected to develop physical fitness. In accordance with the objectives of PESH in reference [1], it was stated that:

Physical Education, Sports, and Health are an integral part of overall education, aiming to develop aspects of physical fitness, movement skills, critical thinking skills, social skills, reasoning, emotional stability, moral actions, aspects of healthy lifestyle and the introduction of a clean environment through activities selected physical, sport and health systems planned systematically in order to achieve national education goals.

Developing physical fitness is one of the main goals of physical education, this is more detailed in the Subject Guidelines in the 2013 curriculum, which contains 9 Physical education goals, including goals 1 and 2 namely: (1) Developing the importance of physical activity to achieve growth and development of the body as well as lifelong active lifestyle. (2) Develop self-management skills in efforts to develop and maintain physical fitness, properly manage health and well-being and live a healthy life.

Thus it is very clear that the whole physical education learning process must lead to these goals, this certainly becomes the main task for Physical Education teachers to carry out directed and appropriate learning activities in the effort to achieve the goals of the Physical Education especially the development and maintenance of physical fitness. However, the results of measurements made at the beginning on SMAN 3 Banjarmasin students showed that physical fitness status was still lacking and tended to be very lacking, reflected in aerobic endurance with an average maximum oxygen volume (VO2 max), i.e. for men only 33.60 less categories and 25.59 women (ml/kg/min) less categories, whereas according to Cooper in reference [2], a person is said to be fit if VO2 max possessed ranges from 42.6-51.5 (ml/kg/min) for men and 35.0-38.9 (ml/kg/min) for women.

This situation shows that Physical education learning activities in SMAN 3 Banjarmasin have not been directed towards the development and maintenance of physical fitness. This is in addition to the low awareness of the importance of physical activity as well as not meeting the frequency of physical activity because in general in high schools especially in SMAN 3 Banjarmasin Physical Education learning is carried out once a week with time allocation of 3 x 45 minutes or 135 minutes. This situation is certainly not in line with efforts to improve physical fitness.

Based on the concept of increasing physical fitness that "physical fitness will increase if exercise is done at least 3 times a week" [3]. In addition, there are also several factors that also determine, namely the intensity, duration and type of exercise. However, these three factors, in this case, are difficult to fulfill because they are in the learning process at school, not in training programs or sports achievements. A Physical Education teacher certainly must keep trying in an effort to improve the physical fitness of students, one of the possible initial steps is to increase the frequency of sports activities that are 2 times a week so that the minimum frequency is met so that efforts to improve the physical fitness of students become logical. The question is “How to increase
the frequency of physical activity 3 times a week through Physical Education learning which is only done once a week”.

In Physical Education learning, of course, students must be equipped with the concept of fitness and various forms of sports activities that lead to increased physical fitness so that students are expected to be able to do physical activities independently outside of Physical Education learning. Besides that, in the structure of the national education curriculum in the 2014 Ministry of Education Regulation, it is explained that: “learning activities are carried out through intra-curricular, co-curricular and extracurricular activities” this activity must be optimized because it can be used as an alternative activity for physical activities in an effort to fulfill the frequency of sports. For this reason, an appropriate method for Physical Education learning activities is needed, namely through the provision of independent assignments outside of Physical Education learning. Basically, this independent assignment is trying to meet the frequency of Physical Activity 3 times a week individually or in groups. As a control function, a physical activity plan is used, which will be validated by the trainer, parents / guardians and accompanied by documentation in the form of photos or videos. At each physical education learning meeting at school, the teacher gives an evaluation, while the physical education learning is more oriented to the concept of physical activity and the preparation of the physical activity task plan to be carried out.

physical education learning activities as much as 1 time a week become a starting point in fulfilling the frequency of physical activity, while physical activity outside of physical education learning that can be made a choice is in accordance with the wishes or likes of students, this is expected to cause a sense of fun and will add its own motivation for students so with your own awareness do it. In the future, it is hoped that this will become a positive habit in the maintenance of lifelong physical fitness.

Based on the description above, it is necessary to conduct a study to determine the effect of adding to physical activity through self-assignment on the level of physical fitness in SMA Negeri 3 Banjarmasain students.

II. METHOD

The level of physical fitness is influenced by several variables including Frequency, Intensity, Duration and Type of exercise, but in this study only focused on one variable that is the frequency with consideration of time and cost constraints. Therefore the design used is pre-experimental designs, means that this research is not a real experiment because there are still external variables that influence the formation of the dependent variable.

The research was conducted beginning with initial measurements and then given treatment for 6 weeks after that the final measurements were made to determine whether there was an increase. For this reason, the pre-experimental designs used are The One Group Pre-test-Post-test design, which means that a group of subjects is treated for a certain.

III. RESULTS AND DISCUSSION

Based on the Table I shows that in the initial test, the average level of physical fitness was 31.01, with the highest score of 46.4 and the lowest score of 23.5. While in the final test the average level of physical fitness is 32.05 with the highest score of 47.5 and the lowest score of 24.6.

<table>
<thead>
<tr>
<th>No.</th>
<th>Central tendency</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The mean</td>
<td>31.01</td>
<td>32.06</td>
</tr>
<tr>
<td>2.</td>
<td>Median</td>
<td>27.05</td>
<td>27.08</td>
</tr>
<tr>
<td>3.</td>
<td>Mode</td>
<td>23.5</td>
<td>26.7</td>
</tr>
<tr>
<td>4.</td>
<td>Standard deviation</td>
<td>7.68</td>
<td>7.56</td>
</tr>
<tr>
<td>5.</td>
<td>Highest score</td>
<td>46.4</td>
<td>47.5</td>
</tr>
<tr>
<td>6.</td>
<td>Lowest score</td>
<td>23.5</td>
<td>24.6</td>
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</table>

Improvement occurred in all samples and very varied. Therefore only the highest, moderate and lowest values will be taken accompanied by physical activities carried out. The increase in the average number of initial and final tests from 31.01 to 32.06 with a difference of 1.05 in quantity tends to be small, this is because in this study only limited to the addition of the frequency of physical activity, while the factors of intensity, duration and type the exercise still cannot be done effectively because the form of treatment is independent so that control in the field is low. So that the activities carried out during the treatment are very varied, but in this case, to facilitate the analysis in this discussion, physical activities will still be recapitulated and presented in the form of a Physical Activity, contains the initial test results before treatment, physical activity 18 times for 6 weeks and the final test results and the amount of VO2max increase. The increase in the average number of initial tests and final tests was from 31.01 to 32.06, with a difference of 1.05.

The number of the biggest increase is 3.6, and the lowest is 0.1, if in terms of the types of activities carried out. The largest increase in 3.6 physical activity done during the addition of frequency 2 times a week during treatment are aerobic exercise twice, skipping 4 times and jogging 6 times with the amount overall 12 times, while physical activities carried out during Physical Education learning as much as 6 times will not be discussed further because it is considered generally accepted activities carried out by all students.

The lowest increase of 0.1 series of activities carried out in aerobic exercise twice, sit-ups 5 times, push-ups 4 times and swim 1 time. As a complement, students who experienced an increase at the secondary level were 1.7 as many as the activities they did were aerobic exercise twice, skipping twice, jogging 3 times, sit-ups twice, push-ups twice and badminton 1 time.

In this table, there are three categories of increase in VO2max, namely the highest 3.6, the middle 1.7 and the lowest 0.1. The three categories above are expected to be able to represent all the increments that occurred in 34 very varied students while the increase is only in terms of the type of dominant activity, whether including anaerobic or aerobic.

An increase also occurred in physical fitness status which was the main topic in this discussion, namely in 6 samples, 1 sample experienced an increase in status from Less to Good and 5 samples from very poor status to Less. The six samples in their treatment carried out various sports activities.

The table illustrates that the first sample increased VO2max from 41.8 in the Medium category to 42.6 or an increase of 0.8 in the Good category. The treatment or addition of activity for 18 weeks is doing rhythmic gymnastics 6 times with an average duration of 22 minutes and an average intensity of 165 DNM, playing volleyball 2 times with an average duration of 30 minutes and intensity of 150 DNM, playing futsal 4 times with an average duration of 35 minutes.
and an average intensity of 170 DNM, lifting weights 2 times with a duration of 10 and 15 minutes with an average intensity of 170 DNM, sit-ups 1 time with a duration of 5 minutes and an intensity of 155 DNM and pull-ups with 5 minutes duration with an intensity of 165 DNM. The activity is carried out intensively with varying intensity starting from the lowest intensity of 150 DNM in volleyball game activity and the highest intensity in skipping activity is 175 DNM, while for the lowest duration of 5 minutes in sit up and pull up activities while the highest duration is 45 minutes in game activity futsal. Based on the type of all activities carried out divided into two, namely 72% aerobic activity and 28% anaerobic. In the third sample, there was an increase in physical fitness category with the number of VO2mak 24.9 in the Very Poor category to 25.3 in the Poor category. The addition of sports activities carried out are as follows, rhythmic gymnastics 6 times with an average duration of 16 minutes and an average intensity of 120 DNM, playing volleyball 2 times with a duration of 20 minutes and 110 DNM intensity, skipping 2 times with an average duration of 15 minutes with an average intensity of 160 DNM, push-ups 3 times with an average duration of 8 minutes and an average intensity of 140 DNM and sit-ups 2 times with an average duration of 8 minutes and an average intensity of 140 DNM. All activities were carried out with a range of duration of 8 to 16 minutes and the lowest intensity of 110 DNM in volleyball activity and the highest intensity of 160 DNM in skipping activity. Based on the type of activity carried out consisted of 60% aerobic activity and 40% anaerobic.

In the fourth sample, there was an increase in physical fitness category with the number of VO2mak 24.2 in the Very Poor category to 27.8 in the Less category. The addition of sports activities carried out are as follows, rhythmic gymnastics 6 times with an average duration of 16 minutes and an average intensity of 120 DNM, playing volleyball 2 times with a duration of 20 minutes and 110 DNM intensity, skipping 4 times with an average duration of 14.5 minutes with an average intensity of 149 DNM, and jogging 6 times with an average duration of 15 minutes and an average intensity of 129 DNM. All activities are carried out with a range of duration of 10 to 20 minutes and the lowest intensity of 110 DNM in volleyball activity and the highest intensity of 160 DNM in skipping activity. Based on the type of activity carried out consists of 100% aerobic activity.

In the fifth sample, there was an increase in physical fitness category with the number of VO2mak 23.5 in the Very Poor category to 26.3 in the Poor category. The addition of sports activities carried out are as follows, rhythmic gymnastics 6 times with an average duration of 16 minutes and an average intensity of 120 DNM, playing volleyball 2 times with a duration of 20 minutes and 110 DNM intensity, skipping 4 times with an average duration of 13 minutes with an average intensity of 148 DNM, and jogging 6 times with an average duration of 14 minutes and an average intensity of 127 DNM and swimming 3 times with an average duration of 15 minutes and an average intensity of 130 DNM. All activities are carried out with a range of duration of 10 to 20 minutes and the lowest intensity of 110 DNM in volleyball activity and the highest intensity of 160 DNM in skipping activity. Based on the type of activity carried out consists of 100% aerobic activity.

In the sixth sample, there was an increase in physical fitness category with the number of VO2 mak 24.9 in the Very Poor category to 26.0 in the Less category. The addition of sports activities undertaken are as follows, rhythmic gymnastics 6 times with an average duration of 16 minutes and an average intensity of 120 DNM, playing volleyball 2 times with a duration of 20 minutes and 110 DNM intensity, pulling up 1 time with a duration of 2 minutes with intensity 120 DNM, and sit-ups 3 times with an average duration of 8 minutes and an average intensity of 140 DNM, push-ups 1 time with a duration of 8 minutes and intensity 140 DNM and swim 2 times with an average duration of 33 minutes on average intensity of 114 DNM. Jogging twice with an average duration of 17 minutes and an average intensity of 130 DNM and cycling 1 time with a duration of 35 minutes with an intensity of 110 DNM. All activities carried out with a range of duration of 2 to 35 minutes and the lowest intensity of 110 DNM in volleyball activity and the highest intensity of 140 DNM in sit-up activities. Based on the type of activity carried out consisted of aerobic activity, 61% and anaerobic 39%. Of all the samples taken, there were 6 samples above experienced an increase in fitness categories while 28 others only experienced an increase in the amount of VO2mak. Based on the intensity of the exercises performed by all samples, the highest is 175 DNM and the lowest is 110 DNM. If it is reviewed on the intensity of exercise according to Cooper (1994) in Giri Wijoyo (2017: 91) that adequate health exercise intensity (adequate) is the exercise pulse reaching 65-80% (1994) in Giri Wijoyo (2017: 91) that adequate health exercise intensity (adequate) is the exercise pulse reaching 65-80% of the maximum pulse is 121.8 - 162.5 DNM. This amount is very close to the intensity during the treatment that is 110-175 DNM. In addition to the intensity, the results of the exercise are also very influenced by the duration or duration of the exercise, according to Cooper, sufficient duration in sports is 10-30 minutes without stopping if seen from table 3.12 the lowest duration is 8 minutes, and the highest is 35 minutes also according to the criteria. However, what needs to be questioned is whether the duration is carried out without interruption, it becomes one of the important questions since the treatment is carried out independently without direct supervision.

In general, the addition of activities carried out by all samples can be categorized into aerobic and non-aerobic, said to be anaerobic or aerobic in terms of 3 factors, namely:

A. Type of Muscle Contraction

In reference [4], if activities that predominantly involve isometric or isotonic contractions with heavy loads are included in anaerobic activity. Isometric contractions are contractions that cause stress without changes in length. It was explained that during an isometric contraction the circulation of blood in the muscle stops because the diototous blood vessels are trapped during the contraction so that the muscle will lack blood which carries O2 as a requirement for muscle cells to contract. Therefore, isometric contractions will not last long. While isotonic contractions with heavy enough to heavy loads also cause tension in the muscles, the heavier the load, the higher the stress that occurs so that the blood vessels also stop. Examples are weight lifting, wrestling, push-ups, sit-ups and pull-ups.

Activities that involve isotonic muscle contraction can be categorized as aerobic activity on the refit below the minimum frequency or with light loads. Isometric contractions are contractions that cause tension and simultaneously affect
Based on the consideration of the 3 elements that have been presented above, if related to the activities carried out can be explained as follows, namely:

First, the largest increase of 3.6 occurred in the sample, which at the time of the initial test, the achievement of VO2mak was very low. Then do aerobic activities and tend to remain in the form of aerobic skipping and jogging during treatment. Aerobic activity that is carried out regularly and intensively with the duration that is appropriate (adequate) causes specific adaptation changes in the ultra and biochemical structures in the muscles. Research using Electron Microscopes on Vastus Lateralis muscle in long-distance runners and in untrained people shows significant changes, namely an increase in interfibrillar and peripheral mitochondrial volume, ratio of mitochondrial volume to myofibril volume, outer and inner surface density of mitochondrial membrane and levels of fat drops (pleated droplets). In addition, there is also an increase in the activity of the enzyme SDH (succinate dehydrogenase), an enzyme that plays a role in the cycle of Krebs and 3-hydroxy-acetyl-CoA-dehydrogenase (HAD) enzymes which play a role in β-oxidation of free fatty acids. Conversely, there is no change and even a decrease in the level of activity of enzymes that play a role in anaerobic glycolysis [4]. Aerobic exercise also increases the capacity of the oxygen transport system, cardiac output (cardiac output) and cellular capacity, thereby increasing the maximum oxygen uptake capacity (VO2mak).

Second, the increase in VO2mak by 1.7 activities carried out was heterogeneous between aerobic and anaerobic, namely aerobic exercise, jogging, push-ups, sit-ups, skipping and badminton, this also affects the impact. The effect of aerobic activity has been explained before, which needs to be explained further is the impact of doing the anaerobic activity on increasing aerobic capacity. Energy anaerobic activity comes from the anaerobic process of alactacids and lactacids which have been described previously; in the process, both do not involve oxygen. A person who is doing an anaerobic activity can mobilize large amounts of energy in a short time, but can only last for a short time because the phosphate energy reserves available in cells are almost entirely used up. Although anaerobic activity involves a large amount of muscle, its systemic impact on exercise throughout the body is minimal [4]. Third, at the lowest increase in VO2mak count of 0.2, there are two different groups. In the first group, the increase was 0.2 because the activities carried out almost all included anaerobic activities, namely aerobic exercise, push-ups, sit-ups, and squad jumps. So the impact on aerobic capacity is very little. The increase may be derived from 2 aerobic activities carried out namely aerobic exercise and or activities outside of treatment. In the second group, the increase of 0.2 was not the same as group one; in fact, the activities carried out were predominantly aerobic. However, the increase tends to be small because, in this group, the initial tests have shown a relatively high amount of VO2mak. This means that this group is included in the trained group, which has been regularly exercising.

Based on the duration, the longer the exercise is done, the greater the increase in VO2mak. A minimum duration of 8 minutes for aerobic activity, based on the mechanism of the body's energy system, has been said before that if someone does physical activity or exercise, then the first 0-2 minutes of an energy system that works is anaerobic that is energy derived from ATP that is already available in the muscle, without involving oxygen, then in the next 2-8 minutes if the ATP in the muscle is almost used up then the energy mechanism will be changed by resizing the ATP (recycling ATP) through ADP + PC which produces ATP and keratin,
and the process of glycolysis with the main ingredients glycogen (glucose) + ADP to produce ATP, but in this process also produces lactic acid which causes fatigue. In this process also without involving O2. If the activity is still carried out with a duration of more than 8 minutes, the anaerobic system has begun to decline due to the increasing levels of lactic acid in the muscles and blood so that it inhibits the process of glycolysis. This situation will reduce the intensity and even cause the activity to stop.

In order for the activity to continue, another energy source is needed, namely through the aerobic energy system through the oxidation process involving oxygen continuously. This aerobic system not only provides energy but also reduces lactic acid levels, through the oxidation process of lactic acid is changed again with the help of ADP + O2 to ATP by producing carbon dioxide (CO2) and H2O, so that contractions will continue in a relatively long time. The greater the supply of O2, the better the availability of energy and the faster the recovery process.

The ability of the body to supply and process O2 is called aerobic capacity (VO2mak), the higher the VO2mak of a person, the better the physical fitness. Therefore a person if he wants to increase VO2mak then he must practice with a duration of at least 8 minutes and the activities undertaken are aerobic activities.

From the results of the above discussion it can be concluded, namely: firstly it is generally stated that the greater the percentage of aerobic activity carried out intensively, the greater the increase in VO2mak that occurs.

Secondly, the increase in VO2mak is not large because this research only emphasizes the fulfillment of minimal frequency, while the intensity, duration and type of exercise are not optimal because the field control is very low because it is independent.

Third, although in general treatment cannot completely improve physical fitness status, individually there are several samples that have improved physical fitness status.

Fourth, the increase in VO2mak is an indicator of increasing one's physical fitness, therefore if someone wants to improve physical fitness, then that person must do physical activities that are aerobic, while the minimum duration in doing so is 8 minutes.

From the discussion of the results of this study, it is certainly expected to be the first step in efforts to improve physical fitness in school by emphasizing more on other elements of physical fitness namely intensity, duration and type of exercise so that there will be a more significant increase in physical fitness.

Increasing physical fitness is also influenced by the role of a teacher in delivering Physical Education material in schools, guidance and direction as well as providing an understanding of the concept of physical fitness must still be done. The use of strategies in proper learning will also provide opportunities for students to undertake Physical Activity outside of learning at school so that it is hoped that it will become a positive habit in efforts to maintain and improve physical fitness in the future. Efforts to improve physical fitness through the addition of independent activities is certainly not free from obstacles and problems that occur in the field, namely: 1) Limited control / supervision of researchers in the implementation of the treatment, because as many as 2/3 treatments do not get direct supervision based only on the reports made by students in the form of physical activity sheets accompanied by photos and videos. 2) The level of validity of activity sheets, photos and videos made by students is still low related to the achievement of the intensity and duration of the exercise. 3) Lack of motivation, especially for students who do not really like sports, so that the activities carried out impressed carelessly. The obstacles and problems above will be "homework" for researchers about how to overcome them or at least reduce them.

A positive thing obtained in this study is to provide new experiences for students starting from the preparation of activity plans, implementation and reporting activities. At these stages, especially when carrying out independent activities, some very interesting things were seen from the recorded activities in the form of video and in the form of questionnaires. Most students feel happy and happy, and physical activity is considered as a form of repressing and entertainment in itself because most are done in groups. The creation of a sense of togetherness, good cohesiveness in determining the physical activity are to be carried out and in its implementation. In the opinion of reference [5] said that physical education extracurricular activities benefit students, then according to reference [6] said that students who take extracurricular activities have better fitness. In general, extracurricular activities benefit students in school.

**IV. CONCLUSION**

Based on data analysis and hypothesis testing it can be concluded that "There is an effect of adding Physical Activity 2 times a week through independent assignments outside of physical education learning to improve physical fitness in high school students 3 Banjarmasin". Efforts to improve physical fitness through the addition of independent activities is certainly not free from obstacles and problems that occur in the field, namely: 1) Limited control/ supervision of researchers in the implementation of the treatment, because as many as 2/3 treatments do not get direct supervision based only on the reports made by students in the form of physical activity sheets accompanied by photos and videos. 2) The level of validity of activity sheets, photos and videos made by students is still low related to the achievement of the intensity and duration of the exercise. 3) Lack of motivation, especially for students who do not really like sports, so that the activities carried out impressed carelessly.

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