Senam Ayo Bangkit Training Increasing Physical Fitness Reviewed From Maximum Oxygen Volume (VO_2Max)

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Abstract

Physical training has an important role in maintaining and increasing the degree of physical fitness seen from the VO_2Max ability. The aim of the study was to find out that let's rise up can improve physical fitness in terms of VO_2Max. This type of experimental research was the randomized pretest posttest control group design. The sample of this study was that of 22 students of the Physiotherapy Study Program divided into 2 groups. Group 1 was given a let's get up and group 2 as a control group, with a frequency of training 3 times a week for 6 weeks. VO_2Max was measured by the Bleeps Test (MFT) instrument. The normality and homogeneity tests of the data show that the data distribution is normal and homogeneous. The mean intra-group difference test VO_2Max was tested by using t-paired test. Different test results with t-paired before and after training, Group 1 and Group 2 were significantly different ($p<0.05$). The VO_2Max test results between the two groups before and after the training were tested by t-independent sample test. The mean VO_2Max in the two groups before training was $p = 0.21$ ($p>0.05$) and after training $p = 0.00$ ($p<0.05$). In Group 1, the mean VO_2Max (L/m) before training was 26.34 and the mean after training was 35.48 with a difference of 9.14 and an increase in percentage of 34.70%. Whereas in Group 2, the mean VO_2Max before training was 25.36 and the mean after training was 27.42 with a difference of 2.06 and an increase of 8.12%. This shows that the treatment of group 1 and group 2 both had an effect. However, the increase in group 1 was better than group 2. It can be concluded that the let's get up exercise training can improve physical fitness in terms of VO_2Max.

Keywords: *Senam Ayo Bangkit* training and VO_2Max

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training was 26.34 and the mean after training was 35.48 with a difference of 9.14 and an increase in percentage of 34.70%. Whereas in Group 2, the mean VO_2Max before training was 25.36 and the mean after training was 27.42 with a difference of 2.06 and an increase of 8.12%. This shows that the treatment of group 1 and group 2 both had an effect. However, the increase in group 1 was better than group 2. It can be concluded that the let's get up exercise training can improve physical fitness in terms of VO_2Max.

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INTRODUCTION

Physical training plays an important role in maintaining and improving health status in this case physical fitness. The better a person's physical fitness, the better his physical physiological abilities. In addition, physical training is useful so that the body does not quickly experience excessive fatigue during strenuous physical activities, prevents obesity and improves health status (Sharkley, 2009).

Physical training is important to increase the degree of physical fitness. An athlete has good technique and tactics but will not be able to show his maximum performance throughout the competition without being supported by excellent physical body abilities, especially cardiorespiratory endurance or often called general endurance. This endurance is related to the maximum oxygen volume (VO_2Max) and one of the parameters of physical fitness. Maximum oxygen consumption is abbreviated as VO_2Max, which means it indicates the body's maximum oxygen volume capacity expressed in liters per minute. The maximum ability of the function of the lungs, heart, and blood vessels is an assessment parameter in measuring a person's maximum oxygen consumption. To increase VO_2Max, physical training programs must be carried out in a measurable, precise, regular, systematic, and progressive manner that follows the principles and methods of training that are precise and accurate in order to achieve the training objectives (Hairy, 1989).

Physical fitness/physical fitness is the body's ability to carry out daily work activities or tasks without causing significant fatigue to a person. Physical fitness is determined by several components, and is closely related to daily physical activity, namely the general endurance component of the body, in addition to being complemented by several other components such as strength, body composition, and flexibility/flexibility. Physical fitness is useful for everyone to support their daily physical activities. Physical fitness must be maintained or maintained and given a continuous exercise program with the aim of staying in top condition. It is very important to improve physical fitness to prevent health problems such as degenerative diseases, easily tired /tired/lethargic which can reduce work effectiveness and productivity (Berkat, 2016). Therefore, it strengthens the researcher's decision to carry out healthy exercise for physical fitness. The chosen healthy exercise is *Senam Ayo Bangkit*. Ayo Bangkit Gymnastics is a physical fitness exercise created by the Indonesian Community Sports Federation (FOMI) which reflects the desire to formulate and contribute new physical fitness gymnastics.

Senam Ayo Bangkit (SAB) is also a gymnastics activity that is carried out accompanied by musical instruments, yells, and clapping. So, with variations like that, this type of gymnastics activity becomes even better to carry out together. Music has the energy power to arouse enthusiasm so that the presence of music in let's get up gymnastics can have a positive effect that indirectly raises the spirit of people who do the gymnastics and enjoy the movements in gymnastics according to the existing rhythm. Let's get up gymnastics is not much different from physical fitness exercise that is carried out in general, which uses a count of 1 to 8 for static movements and then 2 times 8 for dynamic movements in this series of gymnastic movements. This gymnastic movement consists of movements of the feet, hands, neck, and

head. In addition, let's get up gymnastics has elements of physical fitness such as strength, balance, flexibility, and movement coordination. This will be very well applied to the wider community both for children, adolescents, and adults, especially for students. This is because the student period, both in public and private universities, is the right time to start, maintain and maintain a degree of physical health in the midst of busy lectures. This is because the age ranges from 18-25 years, entering a golden age in achievements in their respective fields and capable of growing and developing.

Therefore, researchers are looking for solutions to problem solving by providing healthy exercise before and after lectures and also looking for an empty schedule so that they can do healthy gymnastics together to improve students' physical fitness to prevent disease, especially now in the Corona Virus (Covid-19) pandemic that hit the world today. The healthy gymnastics chosen by the Let's Rise Gymnastics and providing special guidance on sustainable Let's Rise gymnastics training, meanwhile, to improve health status (physical fitness) and disease prevention so that the body's immune system is good to avoid all kinds of diseases due to the Corona Virus pandemic, inspire the spirit to rise from the epidemic of disease outbreaks experienced by the world lately.

Senam Ayo Bangkit is one of the most popular fitness/physical fitness exercises today by children, teenagers, and adults. This exercise has dynamic movements, is very easy to do and the rhythm of the music stimulates excitement and creates a sense of enthusiasm. This exercise combines strong, flexible, and agile muscle movements to maximize physical fitness. Let's get up gymnastics is a series of gymnastic activities aimed at maintaining and improving one's physical fitness that involves biomotoric components through movements that require general endurance (VO_2Max), muscle strength and endurance, agility, balance, and coordination of regular physical movements. Therefore, researchers are interested in conducting a study for students of the Physiotherapy Study Program, International Bali University for the 2019/2020 academic year who have an interest or desire to improve their physical fitness in terms of VO_2Max ability by participating in gymnastics training, let's get up together on campus.

METHOD

This type of study is experimental research. In events that occur as a result of providing interventions to events that already exist in nature (Kanca, 2010). The intervention in this case is the provision of training programs and the let's rise gymnastics training model. The research design was The Randomized Pretest-Posttest Control Group Design (Pocock, 2008). It can be seen in the Figure 1.

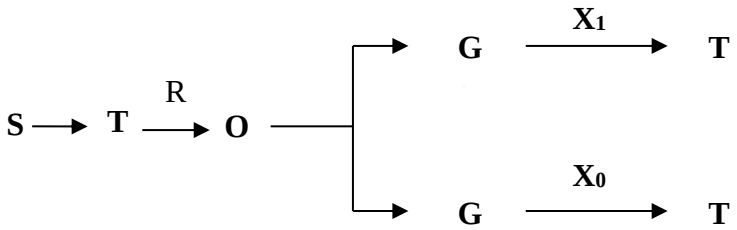

Figure 1. Research design

The place for the research is in the ceremonial field of the International Bali University (UNBI). The study was conducted from October 10 to December 30, 2020. The duration of the training was six (6) weeks, the training frequency was three (3) times per week starting from every Wednesday, Friday, and Saturday. Practice time is in the morning at 06.30-08.00 WITA and in the afternoon at 16.30-18.00 WITA.

The sample of this research is all 22 students of the Physiotherapy Department, Faculty of Health Sciences for the Academic Year 2019/2020 and have met the inclusion and exclusion criteria. Based on the results of the initial test, namely the bleeps test (multistage fitness test), the research sample was divided into two groups using the ordinal pairing technique, which is one way of dividing the research sample into two or more groups/groups for each group having almost the same ability and aiming for similarities. Uniformity of ability between the intervention group and the control group. Furthermore, they were divided into two (2) groups, namely group 1 (G1) given gymnastics training, then group 2 (G2) as the control group. This gymnastics training is given a load that uses the principle of overload in the form of increasing repetitions and sets gradually. Increased intensity using the ladder system, namely increasing the training load carried out every week. In addition, there is a decrease in the training load, which is intended to provide an opportunity for the body to recover or regenerate and adapt to the given training program.

The stages of data collection are very important in determining the data analysis of a study to obtain valid results. The data obtained in this study are quantitative data. Data collection was obtained using test and measurement instruments. While the instrument used for data collection is the bleeps test procedure. The research data was obtained from the measurement of the dependent variable, namely VO_2Max. Then the data that has been collected is in the form of pretest and posttest for each intervention group and control group. The posttest was carried out after the intervention group was given the let's rise exercise for 6 weeks of training and then in the same test as the pretest. Then analyzed based on the measurement results from each group.

The data obtained were analyzed with the application software application program Statistics Program Service Solution (SPSS) 16.0. Then analyzing age (U), weight (BB), height (TB), and Body Mass Index (BMI) the data was obtained before the pretest started. Data normality test to show that the tested data is normally distributed. The normality test of the data uses the Shapiro Wilk Test instrument, while the homogeneity test of the data uses the Levene Test. Hypothesis test, which is a paired t test to analyze the average increase in the maximum oxygen volume before and after intra-group training, because the data are normally distributed and homogeneous. Then test the hypothesis that the let's rise exercise training can increase VO_2Max, using an independent t-test to determine the difference in treatment and find the percentage increase between groups.

RESULTS AND DISCUSSION

The research has been carried out in the ceremonial field of the International Bali University for Students of the Physiotherapy Study Program, UNBI which is located on Jalan Seroja, Gang Jeruk, Tonja Village, Denpasar. Experimental research was conducted for 6 weeks involving one treatment group and one control group. The sample amounted to 22 people, then divided into two (2) groups, each group consisted of 11 people. G1 was given the let's get up exercise training and G2 was the control group. The data obtained based on the results of the study in the form of data on the characteristics of the research sample and data on the results of the maximum oxygen volume capability of the two research groups.

The data on the characteristics of the research sample were analyzed including age (U), height (TB), body weight (BB) and body mass index (BMI), in Table 1. Table 1 is the characteristics of the sample in the categories of age, TB, weight and BMI in the two groups before training, there were no significant or significant differences. So, each group has almost the same characteristics and abilities.

Table 1
Characteristic Data

No	Characteristic	n	Group 1 Mean	Group 2 Mean
1.	Age (y)	11	21,40	19,90
2.	Body Height (cm)	11	171,09	170,90
3.	Body Weight (kg)	11	72,18	66,63
4.	IMT (kg/m^2)	11	24,68	22,69

The distribution of the research sample data, then the data normality test was carried out with the Saphiro Wilk Test instrument while the homogeneity of the data was carried out with the Levene Test instrument. The test was carried out with the data obtained in these two groups, both before and after the training. The dependent variable tested was VO_2Max before and after training in each group, as shown in Table 2.

Table 2
Normality Test Results, Homogeneity of VO_2Max Data Before and After Training

Variable	Training	(p) Normality Data (*Shapiro Wilk Test*)		(p) Homogeneity Data (*Levene Test*)
		Group 1	Group 2	
VO_2Max (liter/minute)	*Pretest*	0,25	0,07	0,12
	Posttest	0,87	0,65	0,10

Table 2. is the analysis of the normality and homogeneity test of VO_2Max data before and after training, obtained in both groups the probability value (p) is greater than 0.05 ($p>0.05$) meaning that the VO_2Max result data before after training the data is normally distributed and the variation of the data is homogeneous then further test with parametric statistical test.

The results of different tests to determine and compare the average VO_2Max results, before after training, namely between K 1 and K 2, namely the let's rise gymnastics training group with the control group. The results of the analysis using paired t-tests for intra-groups are shown in Table 3.

Table 3
Results of the VO_2Max Mean Difference Test Before After Intra-Group Training

VO_2Max (liter/minute)		n	Mean	t	p
Group 1	Before Training	11	26,34	-10.865	0,00
	After Training		35,48		
Group 2	Before Training	11	25,36	-5.925	0,00
	After Training		27,42		

Table 3 is the mean VO_2Max result, before after training between the two groups with a probability value less than 0.05. It states that the mean VO_2Max after training in each group there is a significant difference ($p<0.05$). Therefore, the results of the difference in the mean VO_2Max before training between G1 and G2 are equivalent or comparable. The difference in

VO_2Max after training is significantly different, which means that the difference in final results is caused by differences in the type and model of the training provided.

Knowing the increase in VO_2Max between the two groups both before and after training. The results of data analysis using the t-independent test are shown in Table 4.

Table 4
Test Results for Increasing VO_2Max Before After Intergroup Training

Variable	Training	Mean		t	p
		Group 1	Group 2		
VO_2Max (liter/minute)	Before	26,34	25,36	1,27	0,21
	After	35,48	27,42	6,78	0,00

Table 4 shows that the mean VO_2Max before training between the two training groups with a probability value greater than 0.05 while after training the probability value is smaller than 0.05. This means that the mean VO_2Max before training between the two groups was not significantly different ($p>0.05$). Then the mean VO_2Max before training is equivalent or comparable. Meanwhile, the difference in VO_2Max after training was significantly different ($p<0.05$), which means the difference in the final result was caused by different types of training provided.

After 6 weeks of training, there was a difference in the increase in the effect of the treatment effect and the percentage in the form of percent. The percentage increase in VO_2Max in both groups, using the formula Arikunto (2004): $P = \frac{T2 - T1}{T1} x(100\%)$

Tabel 5
VO2Max Percentage of Each Group

VO_2Max (liter/minute)	Group 1	Group 2
Before Training (T1)	26,34	25,36
After Training (T2)	35,48	27,42
Increase Difference (T2–T1)	9,14	2,06
Percentage	34,70%	8,12%

The percentage increase in VO_2Max in the two training groups carried out for six weeks in Table 5 which states that the increase in VO_2Max after G1 training is greater than G2. This indicates that both groups have an increasing effect after the study. The percentage increase in VO_2Max in G1 training is higher than in G2 training.

Senam Ayo Bangkit Training Can Increase Maximum Oxygen Volume (VO_2Max). The increase in the ability of the maximum oxygen volume in the treatment group was caused by the let's rise gymnastics training, this was due to training for 6 weeks, with a training frequency of 3 times per week and then the predetermined exercise dose so that it was useful for increasing the maximum oxygen volume (VO_2Max) where adaptation occurred. cardiorespiratory system in the body against the training load given when the training is carried out. Training given 4 to 6 weeks will get progressive results, where the response and physical adaptation have been adapted to training (Nala, 2011).

Theoretically, the training is an exercise in movement/physical activity and mental activity that is carried out measurably, systematically and repeatedly within a certain period of time with increasing intensity (training load) aimed at improving the body's physiological system at one time and carrying out physical activities so that achieve maximum results (Kanca, 2004). In physical training, the aerobic energy system is predominantly a form of physical exercise that puts pressure on the organs/muscles being trained. The load provides an opportunity to increase the cardiorespiratory system (endurance) in distributing oxygen throughout the body.

Physical training that is carried out systematically, measurably and regularly with the right dose and time of exercise, produces physiological changes that lead to the body's biomotoric components, namely physical abilities that produce more energy and improve the performance of physical conditions. The type of physical exercise that is given on target provides a positive or better change, namely an increase in anaerobic and aerobic substrates namely ATP-PC, creatine and glycogen as well as an increase in the role of the number and activity of enzymes in the body's energy metabolism process (Hairy, 2009).

Senam Ayo bangkit training mainly uses the aerobic energy system (O_2), where aerobic endurance is controlled by the capacity of the lungs, heart, and blood vessels as well as the respiratory system to deliver oxygen to active muscles. The let's get up exercise method is by providing a progressive and gradual increase in the intensity of exercise, namely from repetitions of every weekly exercise. As a form of exercise with an aerobic energy system, this method has a good effect on increasing VO_2Max which is the dominant factor in showing an increase in a person's body ability and VO_2Max ability in providing an overview of the magnitude of motor power ability in a person's aerobic process (Sukarman, 2006).

Physical exercise in this case physical fitness exercise (SAB) can provide positive changes in most of the functions of the body's physiologic system. The positive changes that occur during training are called responses. Changes that occur due to routine and programmed training according to the basic principles of training or are often called adaptations. A fast heart rate during exercise is the response of the heart organ, then after gradual exercise the heart rate gradually stabilizes because the muscle strength of the heart organ increases to pump blood throughout the body, this is an adaptation of the heart organ to physical exercise that is carried out. The heavier the physical activity carried out during exercise, the greater the need for O_2 in body tissues, and to compensate, the heart and circulatory system must work harder to meet the needs of O_2 in body tissues (Wiarto, 2013).

In the gymnastics training, let's get up mostly using the aerobic energy system (O_2), where this aerobic resistance is controlled by the capacity of the heart, lungs, and respiratory system to provide oxygen to active muscles during physical activity. This training method is given by providing additional training loads gradually and progressively each week of exercise. As a form of exercise with an aerobic energy system, this method has a good effect on increasing VO_2Max. The maximum ability of the function of the heart and lungs is a parameter and an assessment of the maximum ability of a person's body to measure its maximum oxygen consumption (VO_2Max). VO_2Max has a great influence on a person's physical endurance, namely the absorption, use and transport of oxygen by muscles (Ismaryati, 2008).

A person's level of oxygen consumption depends on a person's size and activity level. There are several factors that determine VO_2Max, including heart capacity, the ability of the cardiorespiratory system to function properly, heart function, blood volume, red blood cell count, normal hemoglobin concentration and vascular ability to flow blood from an inactive tissue to an active tissue, and major tissues, especially muscles. which must have a normal capacity to use O2 or normal metabolism, as well as mitochondrial function (Hairy, J. 1989).

This research is supported by research by Kamajaya (2013) entitled "The Effect of 2008 Physical Fitness Training on Maximum Oxygen Volume in terms of Initial Ability". Research

from Prayogo (2013) entitled "The Effect of Scout Exercise and Fitness Gymnastics on Physical Fitness Levels". Physiologically, VO_2Max is influenced by the cardiorespiratory system to supply blood to the main active tissues and the ability of muscles to use O_2 carried by blood containing Hemoglobin. Efforts to increase VO_2Max are carried out through physical training that increases one or both of these factors. An increase in the cardiorespiratory system and the musculoskeletal system will increase VO_2Max.

Positive changes that occur due to aerobic endurance training are: (1) Changes in the cardiorespiratory system caused by aerobic endurance training, which includes the oxygen transport system. The O_2 transport system involves the circulatory, respiratory, and tissue systems to work together in one goal, namely to release and deliver O_2 to the working muscles. With aerobic endurance training can improve the adaptive response of the heart to physical activity and in trained people can work more efficiently in all jobs. The vascular capillaries in the muscles increase so that the diffusion of oxygen in the muscles becomes better/easier, as a result, they have the ability to transport and use oxygen on average greater than in people who are not trained. So, it can consume more oxygen per unit of muscle mass and can work longer lasting. (2) Increased muscle endurance related to the ability of a group of muscles to maintain and increase power for a long time and the ability to supply O_2 during muscle contraction. Sports physiologists state that aerobic capacity is the best indicator of a person's physical endurance. High aerobic capacity can only be achieved by doing regular, measured and progressive resistance training. This is due to changes in mitochondria that function as an energy supply system that contributes to an increase in respiratory capacity in the body. Mitochondria are mainly involved in the use of oxygen for energy production (ATP), while oxygen in the mitochondria comes from muscle cells transported by myoglobin which is responsible for storing and transporting O_2 from muscle cells to mitochondria (Hairy, J. 1989).

It's better to do gymnastics, let's get up to increase VO2Max, it can be caused by the type of exercise given during exercise will affect energy use during exercise. Thus, G1 is more effective and efficient than G2 in increasing VO_2Max, because the research sample on G1 has the opportunity to perform regular and regular physical movements so that they are more consistent in providing exercise so that the body adapts to training. The research sample in G2 was given a warm-up first, followed by light and fun movements such as traditional games, where the training load was lighter so that it adjusted to the training load given during the exercise. This factor causes the intensity of G1 to be more effective and to carry out more specific and optimal training than in G2.

Let's get up gymnastics training is beneficial both for changes in the body's physiological adaptation response, not only increasing VO_2Max but also increasing the effectiveness and efficiency of the circulatory system and energy supply system in the mitochondria so that they can practice more effectively and for longer without experiencing significant fatigue. Other effects include increasing the filling capacity of the heart and increasing muscle contraction, which means more blood is pumped with each heartbeat, increasing heart vascularity, which means increasing the input of red blood cells into the muscles and heart muscle, increasing red blood cell levels, or blood cells resulting in increased O_2 carrying capacity in the body (Brown, 2001).

CONCLUSION

Senam Ayo Bangkit training can improve physical fitness which is reviewed by VO_2Max in Physiotherapy Department Students, Faculty of Health Sciences (FIIK), Bali International University (UNBI) Academic Year 2019/2020.

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