

## Comparison of Poco-Poco GWR and Indonesian Asma Gymnastics to increasing vo2 max

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### ABSTRACT

*This study aims to find out the comparison between the GWR poco-poco gymnastic exercise and the Indonesian Asthma Gymnastics exercise to increase the ability of Volume Oxygen Maximum (VO<sub>2</sub>max). The method used in this study is a pure experimental method (true experiment), while the research design used is the pre-test-post-test control group design. The population in this study were 16 students of Physical Education. The data collection technique for the VO<sub>2</sub>max test uses a Multi-Stage Test (Bleep Test). The data analysis technique uses Analysis of Variance (ANOVA). The results of this study indicate that there is a significant effect of Poco-poco Gymnastic exercises  $31.94 > 2.31$  and Indonesian Asthma Gymnastics exercises  $(33.92 > 2.31)$  on the ability to increase VO<sub>2</sub>max in Physical Education Students at PGRI Palembang University. The conclusion of this study is that Indonesian Asman exercises are better than Poco poco gymnastic exercises in increasing VO<sub>2</sub> Max. The research findings will provide an understanding of the benefits and effectiveness of each type of exercise in increasing the body's aerobic capacity. Following are some of the findings that may be related to this study: Increase in VO<sub>2</sub> Max: Research may show whether Poco Poco GWR or Asthma Gymnastics Indonesia exercises are more effective in increasing VO<sub>2</sub> max.. This can involve measuring heart rate, blood pressure, and other factors related to heart health. Functional Fitness: This will provide an understanding of the additional benefits that may be associated with each type of exercise. The implications of this research can be useful in several ways: Exercise Guidelines: Research results can assist in developing more effective exercise guidelines for increasing VO<sub>2</sub> max and cardiovascular fitness. This information can be useful to both individuals looking to improve their fitness and coaches looking to improve their training programs. Exercise Choice: With a better understanding of the benefits and effectiveness of each type of exercise, individuals can make smarter choices about which type of exercise best fits their fitness goals.*

*Keywords: Poco-poco gymnastics, indonesian asthma gymnastics, vo2 max*

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## INTRODUCTION

Physical fitness is a series of physical characteristics possessed or accomplished someone related to ability to perform physical activity (Indrayana, B. 2016). From the point of view of Sports Physiology, Sport is a series of regular and planned body movements that people consciously do to improve their functional abilities, in accordance with the purpose of doing sports. Sports are divided based on their nature or purpose, namely achievement sports, recreational sports, health sports and educational sports (Gunarsa & Wibowo, 2021) the reality on the ground, both in the educational environment and in government agencies and in society, physical fitness gymnastics activities vary widely. Physical fitness is the condition of a person's body that has an important role in daily activities or activities (Arifin, 2018). Every individual needs to have an ideal level of physical fitness. It is adapted to the demands of tasks and activities in everyday life. Physical fitness is a person's body's ability to carry out daily work

tasks, without causing significant fatigue. (Ulfah et al., 2021) especially in the ability of the heart, lungs, blood vessels. VO<sub>2</sub>max is the most important part of doing activities for humans. Metabolic processes in humans mostly involve oxygen gas (O<sub>2</sub>) to be able to produce energy that will be used to carry out daily activities through various chemical reaction processes. Overall the process of glucose metabolism will produce carbon by-products dioxide (CO) and water (H<sub>2</sub>O). Carbon dioxide is produced from the Citric Acid cycle while water (H<sub>2</sub>O) is produced of the electron transport chain. Through the process of metabolism, energy will then be generated in the body form of ATP and heat energy (Irawan, M. A. 2007) from these various chemical reaction processes, carbon dioxide gas (CO<sub>2</sub>) will also be produced as a waste product that needs to be removed by cells. Respiration or breathing can be defined as the process of exchanging gases (obtaining oxygen or O<sub>2</sub> for use by the body's cells and removing carbon dioxide or CO<sub>2</sub> produced by the body's cells) between living organisms and the surrounding environment (Kristiana, M, 2021). Factors that affect the level of VO<sub>2</sub>Max include gender, age, heredity, altitude, exercise and nutrition (Candra & Setiabudi, 2021).

There are many methods to increase VO<sub>2</sub>max, one of which is through gymnastics, especially mass gymnastics which is often done anywhere and anytime. Maximum oxygen volume or VO<sub>2</sub>max is the maximum amount of oxygen that can be used by the body during exercise (Teresa, 2017). Maximum oxygen volume describes a person's aerobic fitness and is an important determinant of cardiorespiratory endurance when doing sports that require a long time.. Maximal oxygen volume measures the capacity of the heart, lungs, and blood to transport oxygen to working muscles and measures the muscles' use of oxygen during exercise. Aerobic endurance is a person's ability to use his heart, respiratory and circulatory systems effectively and efficiently in carrying out continuous work (Nirwandi, N., 2017). Endurance is the ability and ability of the body to carry out sports activities for a long time without experiencing significant fatigue. The players are required to have a good level of endurance measurements taken to determine heart, lung and muscle endurance which is also a major factor in physical fitness (Indrayana, B., & Yuliawan, E, 2019). VO<sub>2</sub>Max is not only a parameter of the level of body/physical ability to take in oxygen, but also sends it to working muscles and helps remove metabolic waste and not only that VO<sub>2</sub>Max is also one of the factors to support achievement (Candra & Setiabudi, 2021), Someone who to have power. In increasing VO<sub>2</sub>max results, exercises are needed which include cardiac endurance, pulmo and muscular endurance exercises, Poco-poco Gwr exercises and Indonesian Asthma gymnastics exercises because these two exercises are one of the well-known physical fitness exercises in the wider

community so that they can easily be studied by society and students, where physical fitness is needed explained that physical fitness is a physical condition that describes the potential and physical ability to perform certain tasks with optimal results without showing significant fatigue (Pratiwi & Oktaviani, 2017). Agree with the explanation above according to Djoko Pekik, physical fitness is a person's ability to carry out daily work efficiently without excessive fatigue arising so that they still enjoy their free time (Anita Adesti & Siti Nurkholimah, 2020) Students at Fornas (National Community Sports Festival) all gymnastics can be followed by all people, therefore it is expected that students can learn various types of gymnastics to improve physical fitness. in the activity of participating in teaching and learning activities in compulsory gymnastics courses and later after these students graduate and become physical education teachers they can apply them in their respective schools, for this reason, the solution to improving and maintaining physical fitness can be through Poco–Poco gymnastic activities, which are gymnastics that really combine art and sport, usually a gymnastic movement is always accompanied by a song and music including almost all dances in the archipelago. In its development, the poco-poco gymnastic movement is very unique and some are even combined with dances such as the Poco-Poco dance from North Sulawesi, which until now has become worldwide.

Gymnastics is a way of treating asthma apart from medical treatment, environmental control, avoiding trigger factors, patient education, physiotherapy, psychosocial therapy and smoking cessation. The Indonesian Asthma Foundation (YAI) has designed exercise for Asthma Club participants called Senam Asthma Indonesia. The aim of the Indonesian Asthma Gymnastics is to train proper breathing, flex and strengthen the respiratory muscles, practice effective expectoration, as well as improve circulation. This exercise can be done three to four times a week for about 30 minutes. Exercise will give results if done at least 5 to 7 weeks. Before doing the exercises, it is necessary to know that the patient is not in a state of asthma attack, not in a state of heart failure but in fairly good health condition (Antoro, 2017). Therefore the authors are interested in researching, "Comparison of the Effect of Poco-Poco Gwr Exercise and Indonesian Asthma Exercise on Increasing VO<sub>2</sub>max in Physical Education Study Program Students, PGRI Palembang University".

## **METHOD**

Educational Research Methods (Umar Sidiq, Moh. Miftachul Choiri, 2019) argues that: Experiment as a research situation in which at least one independent variable, which is referred

to as an Experimental Variable,. The method used in this study is true experiment method, while the research design used is the pre-test-post-test control group design (Rukminingsih et al., 2020). This research is an overview of all the thoughts and activities carried out in the research. In this experimental research, the research design used was "pre-test and post-test".

**Research Instruments** The research instrument used was the Bleep Test (multi-stage running test). In this case there are two kinds of variables, namely: (1) independent variable and (2) dependent variable.

**Independent Variable (X)** The independent variable in this study was the control group of the Gwr poco-poco gymnastics and the experimental group of Indonesian Asthma gymnastics.

**The dependent variable (Y)** The dependent variable in this study was the result of an increase in the VO<sub>2</sub>max value.

**Variable Operational Definition** Operational variables are elaborations or concrete measurements of abstract concepts or variables in a study. Operational variables are used to transform abstract concepts into something that can be measured, observed, or acted upon, the definitions of operational variables provide clues about how these variables will be measured or observed in the research context. This includes specific measurements, data collection methods, instruments or tools used, measurement scales, and criteria used to classify or identify the values of these variables (Kurniati et al., 2015)

**VO<sub>2</sub>max** Students will do a Bleep test in the field using a tone from low to fast in the field, the testee will do small runs from low to high intensity, Poco-poco Gymnastics, students will do gymnastics 14 meetings and Indonesian Asthma Gymnastics Students will do gymnastics 14 times. The population in this study were Physical Education Study Program Students who had participated in the 6th FORNAS (National Community Sports Festival). The sample used in this study was the entire population of 16 students who took part in the Pococ Poco Gymnastics Competition and the Indonesian Asthma Gymnastics Competition at the 6th FORNAS. Data collection techniques taken are data obtained from the results of the bleep test. research procedure before conducting the research the following steps were carried out: preparation stage, research implementation, report stage the aim is to measure the efficiency level of heart and lung function indicated by measurement of maximum oxygen uptake.

**Analysis techniques** the data analyzed were data from the results of the initial and final tests. Calculating the results of the initial and final tests of Poco-poco Gymnastics and Indonesian Asthma Gymnastics on physical fitness using the F test data analysis technique. The conditions for using the F test are: Anava (Analysis of Variance). To test the mean difference between the two groups, one gets the treatment , others do not. By using the t-test

(t-test), we check the effectiveness of the treatment. Testing the significant level of difference between the experimental group Poco-poco Gymnastics and Indonesian Asthma Gymnastics is if the T-table means that there is no significant difference between the Poco-poco Gymnastics group, Indonesian Asthma Gymnastics and the control group vice versa if it means there is a significant difference between the Poco-poco experimental group Poco-poco, Indonesian Asthma Gymnastics, and the Control group

## RESULTS AND DISCUSSION

The subjects of this study were 16 athletes participating in the Gwr poco-poco gymnastics and Indonesian Asthma gymnastics. By taking samples of 8 poco-poco gymnastics participants and 8 Indonesian asthma gymnastics participants. This study aims to determine the comparison of poco poco gwr exercise and Indonesian asthma exercise to increase VO2 max. The results of each of these data are described as follows:

### Pretest and Posttest data of GWR poco-poco gymnastics

The Vo2max pretest data was obtained from the results of the Bleep Test of the research subjects, data collection was carried out before the research subjects received treatment or treatment in the form of gymnastic exercises. Whereas in the Vo2max posttest obtained from the results of the research subject's Bleep test, data collection was carried out after the research subject received treatment or treatment for 16 meetings. The following presents a description of the Vo2 max pretest and posttest data using the Bleep Test.

**Table 1. Vo2Max results**

No	Senam Asma	Skor	No	Senam Poco-Poco	Skor
1	AA	23,6	1	MFDP	20,2
2	BAE	25,0	2	MFA	20,8
3	DP	22,2	3	MIZU	21,5
4	K	22,8	4	MS	20,5
5	MAR	25,2	5	MAS	21,5
6	MAR	21,6	6	MI	19,8
7	MAAR	26,9	7	NRR	22,9
8	MDA	24,2	8	U	21,9

The results of the pretest using the Multistage Bleep Test measurement test for Vo2Max results obtained a mean of 8.78, a maximum category of 15 (Very Good), a minimum category of 5 (Poor), median 8.00, mode 10a, and standard deviation 3.573. The following is the distribution of the frequency of the data obtained during the pretest described in the following table.

**Table 2. Descriptive Pretest Statistics**

N	Vallid	8
	Missing	0
	Mean	8,78
	Std. Error of Mean	0,893
	Median	8
	Mode	5
	Std. Deviation	3,573
	Variance	25,531
	Range	10
	Minimum	5
	Maximum	15
	Sum	140,5

**Table 3. Vo2Max Results (Post-test)**

No	Nama	Skor	No	Nama	Skor
1	AA	26,6	1	MFDP	22,2
2	BAE	31,0	2	MFA	23,8
3	DP	27,2	3	MIZU	25,5
4	K	26,8	4	MS	23,5
5	MAR	30,2	5	MAS	26,5
6	MAR	27,6	6	MI	22,8
7	MAAR	33,9	7	NRR	23,9
8	MDA	33,2	8	U	22,9

**Table 4. Descriptive Post-test Statistics**

N	Valid	8
	Missing	0
	Mean	11,84
	Std. Error of Mean	0,577
	Median	11,5
	Mode	10
	Std. Deviation	2,30
	Variance	10,648
	Range	7
	Minimum	8,5
	Maximum	15,5
	Sum	189,5

### Testing Prerequisites Analysis

Data normality test This needs to be done so that researchers can determine what types of statistics which will be used. If the data to be processed comes from normally distributed population, we recommend using statistics parametrics to perform statistical inferences (Pramono et al., 2021). The Normality Test is meant to find out whether or not a formula is normal that is used to test the normality of data by using the SPSS 22.0 application, the results are as follows.

**Tabel 5. Tests of Normality**

		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	Df	Sig.
Experiment	Pretest	.176	8	.200*	.876	8	.034
	Posttest	.157	8	.200*	.933	8	.273

Based on the table above, the test results on SPSS using the Kolmogorov-Smirnova and Shapiro-Wilk Tests Of Normality are at a significance level of 0.05. Two variables are said to be normal because their significance value is more than 0.05 (> 0.05).

### Homogeneity Test

Homogeneity test Homogeneity test is used to find out whether some of the population variants are same or not. This test was carried out as a prerequisite in the analysis of independent sample t tests and ANOVA. The underlying assumption in the analysis of variance (Anova) is that the variance of the population is the same. The linearity test is to find out whether the two variables have a significantly linear relationship or not. This test is usually used as a prerequisite in correlation or linear regression analysis.

**Tabel 6. Test of Homogeneity of Variance**

		Levene			
		Statistic	df1	df2	Sig.
Experiment	Based on Mean	4.911	1	30	.034
	Based on Median	3.663	1	30	.065
	Based on Median and with adjusted df	3.663	1	24.640	.067
	Based on trimmed mean	4.608	1	30	.040

Based on the table above, the test results on SPSS using the Test for Linearity are at a significance level of 0.05. Two variables are said to have a linear relationship if the significance (Linearity) is more than 0.05 ( $> 0.05$ ).

### Hypothesis Test

A hypothesis is a statement or accusation that while a research problem is still weak/not necessarily true, it must be tested empirically (Smartpls & Pengujian, 2021) states that the formulation of hypotheses is useful for: "(1) focusing on problems, (2) identifying relevant data to be collected, (3) indicating the form of research design, including technical analysis to be used, (4) explaining social phenomena, (5) obtaining framework for concluding, and (6) stimulate further research (Zaki, M., & Saiman, S. 2021) the t-test is used to test the hypothesis which reads "is there an effect of drill training on Vo2Max results in Physical Education Students", based on the results of the pre-test and post-test if the results of the analysis show a significant difference then the use of Poco-Poco and Indonesian Asthma Exercises give effect to increasing the ability of Vo2Max.m Comparison of Indonesian Poco-Poco and Asthma Exercise Groups Based on the data analysis above, it can be concluded that the pretest-posttest results of the poco-poco exercise group and the pretest-posttest data analysis of the Indonesian Asthma exercise group can be seen in the following table.

**Tabel 7. Comparison of Experimental Group t Test**  
Control Group

Variabel	Mean	Mini	Maksi	t	t	Sig.
		mum	Mum	Value	table	
Kelompok <i>Pretest</i>	35,31	28,00	43,00			
Eksperimen <i>Posttest</i>	37,26	29,20	42,40	33,92	2,13	0,000
Kelompok <i>Pretest</i>	33,60	31,00	43,00			
Kontrol <i>Posttest</i>	35,22	26,40	42,10	31,64	2,13	0,000

Based on the table above it can be concluded that the significance of the poco-poco group is higher than that of the Indonesian asthma exercise group. This is evidenced by the difference in pretest and posttest of the experimental group is 0.95, while the difference in value of the pretest and posttest of the control group is -0.38 . This means that the experimental group has a high level of significance compared to the control group.

### DISCUSSION

Based on the analysis of the t test performed, several things can be known to draw conclusions. The results of the analysis in the Indonesian Asthma gymnastics group showed an



increase in students' Vo2max after being given Indonesian Asthma gymnastics exercises. This is indicated by the value of  $t \text{ count} = 33.92 > t \text{ table } 2.13$ , and a significance value of  $0.000 < 0.05$ . There was an increase in Vo2max for Indonesian Asthma Gymnastics. Comparison of Indonesian Poco-Poco and Asthma Gymnastics Groups. The results of the analysis showed that the Indonesian Asthma exercise group was more effective at increasing Vo2Max compared to the Poco-Poco exercise, with a posttest average difference of 1.04. Thus the Indonesian Asthma exercise participants have a better improvement compared to the Poco-Poco gymnastics participants. Thus it can be concluded that Indonesian Asthma Gymnastics is more effectively used to increase Vo2 than Poco-poco Gymnastics  $33.92 > t \text{ table } 2.13$ , and a significance value of  $0.000 < 0.05$ .

Exercise Program Indonesian Asthma Gymnastics is specifically designed to increase lung capacity and quality of life for people with asthma. This exercise program can include regular breathing exercises, stretching, and light exercises that focus on strengthening the respiratory muscles. In this case, exercises focused specifically on lung capacity and breathing may contribute to an increase in VO2 max. Exercise Intensity: Although the exercise intensity data was not specifically stated, the Indonesian Asthma exercise group may have undergone higher intensity training or received better physical stimulation compared to the Poco-Poco exercise group. Higher exercise intensity can provide greater stimulation to increase aerobic capacity and VO2 max. Exercise intensity is to show a component in terms of exercise carried out in various periods and at certain times so that the more exercise done per unit time, the higher it will be. also the intensity. There are several types of intensity in sports, namely: low, moderate, and severe (Maulana et al., 2020) This is shown from the intensity and duration of the exercise performed. Continuity of Exercise In addition to intensity, the continuity factor of exercise is also important in increasing VO2 max. In physical exercise the required energy will increase because in addition to maintaining body functions additional energy is needed for the exercise itself. Physical activity can be increased by doing sports. Exercise can increase the expenditure of energy stored in the body and increase the oxidation of body fat (Amelia & Syauqy, 2014). The addition of this energy can be carried out using aerobic or anaerobic energy systems. If an aerobic energy system is used, an additional O2 supply is needed, but this additional O2 supply it will take time, because it requires adaptation of the respiratory system and cardiovascular system (Supriatna, 2015). If the Indonesian Asthma Gymnastics group consistently carries out its exercise program, both pretest and posttest, perhaps it will benefit from continuous and gradual training. Good training continuity allows the body to adapt and increase aerobic capacity. Individual Factors: Each individual has a different response to

exercise and other factors that affect VO<sub>2</sub> max. This variability can affect the results of increasing VO<sub>2</sub> max in different groups. Therefore, differences in individual responses to exercise can also be a factor influencing differences in results between the Indonesian Asthma exercise group and the Poco-Poco exercise group.

## CONCLUSION

Based on the analysis of the results of the research and discussion above, it can be concluded that: The Indonesian Asthma exercise group was better than the Poco poco exercise group in terms of increasing VO<sub>2</sub>max. This was proven by the difference between the pretest and posttest of the experimental group, which was 1.04, while the difference between the pretest and posttest of the control group was -0.38.

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