



THE EFFECT OF ENDURANCE EXERCISE ON THE BODY'S DEFENSES TO PREVENT TRANSMISSION OF THE COVID VIRUS 19 FOR STUDENT PENJASKESREK UNDANA

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Abstract

Starting from the spread of viruses Covid 19 that swept across the world in particular in Indonesia, bringing the idea to create research that contribute in dealing with viruses Covid 19. This study aims to determine the effect of endurance exercise on the body's defenses to prevent transmission of the virus covid 19 for student penjaskesrek Undana. This research is an experimental study of Quasi-Experimental Designs by using Nonequivalent Comparison Group Design which compares the effect of endurance training on the two levels of physical fitness categories of Penjaskesrek students, those who have very Low and Low categories. Samples were 12 female students from Penjaskesrek Undana in semester 2, 4 and 6, where 6 people were in the less physical fitness category, and 6 in the physical fitness category were very Low. The findings of this study include; 1) In the group of physical fitness Low are Effect of Exercise Endurance Resilience Body face Virus Covid 19 on the students Penjaskesrek Undana significantly, 2) In the group of physical fitness is very Low are Effect of Exercise Endurance Resilience Body face Virus Covid 19 on the students Penjaskesrek Undana significantly. So, the conclusion is that endurance exercises are more effective in increasing endurance to deal with the Covid 19 virus.

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INTRODUCTION

An activity or activities to be carried out, of course there are goals or objectives to be achieved. In Nawawi's opinion, planning is the process of selecting and determining goals, strategies, methods, budgets, and standards (benchmarks) for the success of a company activities. This understanding shows that planning is a process or a series of interrelated activities in choosing one among several alternatives about the goals to be achieved in the planned activities.

Sports activities are generally carried out by a variety of reasons, namely for health, recreation, and educational achievement. Sports is an activity that must be developed in a coaching effort channeled in training, so that sport is expected to be a necessity of life for all Indonesian people. One aspect mentioned in the law is the issue of training. Training confirms directly what should be done in an exercise. Appropriate training can contribute and progress to the expected results. In a simple exercise can be formulated, namely all the power and efforts to improve the overall physical condition, techniques, tactics with a systematic process and repeatedly with increasing number of training loads. In order for the training to achieve optimal performance results, the program or form of exercise should be considered taking into account the individual's basic abilities or individual principles.

Physical exercise is a systematic, continuous and planned process of physical exercise, the results of which can be seen through the gradual increase in the body's physiological capacity for muscle work. This is similar to what was stated by Bompa (cited by Suharjana, 2013) "Physical exercise is a systematic sporting activity for a long time, progressively and individually enhanced which leads to the functional and psychological traits of humans to achieve the set goals. Through physical training

someone to achieve certain goals. In physiological terms, a person pursues the goal of improving the organism system and its function to optimize the performance and appearance of the sport. Proper training with maximum results must be based on the energy system involved in muscle activity according to the type of exercise. "Basic exercise for all types of exercise is aerobic endurance exercise". To increase aerobic capacity, there are various types of exercise, including SCR (Slow Continuous Running), which is continuous slow running with low intensity at a pulse of 130-150 per minute without interspersed with resting time. SCR training is applied to all beginners among athletics, especially for runners to practice basic aerobic endurance (Iwan Budiman 2006). In relation to this research, physical exercise that is done is endurance exercise which in its implementation uses continuous slow running but interspersed with rest.

There are several physical components that need to be considered to be developed in physical training, including cardiovascular endurance, strength endurance, muscle strength, flexibility, speed, stamina, agility, muscle power, strength endurance (Harsono, 2015: 40). Endurance training is one of the physical exercises, according to Sukadiyanto (2011) Endurance is the ability of an athlete's body organs to avoid fatigue during sports or work activities for a long period of time. According to Eri Pratiknyo (2009) Regular, systematic, programmed and continuous physical training with the science and technology approach set forth in the training program, can improve certain physical qualities or conditions. With practice will support an achievement or certain desired state. Physical activity can improve health and prevent some types of disease. Participation in physical activity is also known to reduce depression, stress and anxiety, and increase self-confidence, energy levels, sleep quality, and ability to

concentrate (VicHealth, in Yudik Prasetyo, 2013). Physiologically, exercise can be used as a vehicle for empowering physiological function abilities such as improving health, fitness, and improving the quality of components of physical conditions such as the work of the heart and lungs, agility, speed, and strength (Yudik Prasetyo, 2013).

Endurance training is one of the physical exercises that has been proven to be able to increase the body's immunity against viruses, in this case related to the research conducted, exercise or routine endurance exercise is expected to increase the body's resistance to certain diseases, especially diseases that are endemic when this, covid 19. Covid 19 is one of the viruses that need special attention to be taken to preventive measures through sports activities / endurance physical exercise.

Covid 19 or called Corona virus is a collection of viruses that can infect the respiratory system. In many cases, this virus only causes mild respiratory infections, such as flu. However, this virus can also cause severe respiratory infections, such as pneumonia, Middle-East Respiratory Syndrome (MERS), and Severe Acute Respiratory Syndrome (SARS). Corona virus infection or COVID-19 can cause sufferers to experience flu symptoms, such as runny and runny nose, headache, cough, sore throat, and fever; or symptoms of severe respiratory infections, such as high fever, cough with phlegm and even bleeding, shortness of breath, and chest pain (Kormen Barus 2020: 1).

Then quoted from the official website of the Republic of Indonesia Health, it was said that one of the ways that could be done to prevent the covid 19 virus was to exercise and get enough rest. This is not fundamental because it is based on the narrative of David Nieman, Dr.PH., professor of health at Appalachian State University and director of the Human Performance Lab at the North Carolina

Research Campus, along with Brian Labus, Ph.D., at the University of Nevada , Las Vegas (Fitri Syarifah 2020: 03) "Exercising 30-60 minutes on moderate to fast frequency can help the immune system in preventing viruses. Another opinion was also expressed by Daniel Landers, professor of sports education from Arizona State University who revealed that one of the benefits of exercise on health is to increase endurance, if someone likes to do sports even though not too long but often or long but casually do it, then the activity is said to increase good hormones in the brain such as adrenaline, serotonin, dopamine, and endorphins. These hormones are hormones that play a role in increasing endurance.

Based on the expert's explanation and some of the data raised above, the authors are interested in conducting research on the effect of endurance training on endurance in preventing covid 19 virus transmission for students of Penjaskesrek Undana, the outcome of this study is expected that physical exercise can increase the body's resistance to transmission covid virus 19, This is in accordance with what a sports practitioner from the Surabaya State University, Jatmiko said (cited by Perwitasari, 2020), "that light exercise at a certain level can not only maintain fitness but can also increase one's body immunity and prevent infection with COVID-19".

METHODS

Participants

This research sample focus to female considering female do physical activity less than male student, female student number less than male student, According to WHO data, when compared to men, women are actually more inactive for sports. Globally, 32% of women fail to reach the exercise targets recommended by the WHO. Whereas in men, the figure is 'only' reaching 23%. Experts believe women in the world tend to be less active

because they participate in less sporting activities. When they exercise, they do it at a lower intensity (Windasari, 2018). We gathered all the female students and asked permission to make them a sample. We also told them about the exercises to be done to increase the body's defenses. Moreover, out of 25 female students only 12 female students agreed and allowed to join our study. We started with a pre-test using the Bleep Test to categorize them into very low and low categories.

Sampling Procedures

The comparison group in this study was divided into two groups, namely the physical fitness category which was very low and low. Engel, R. J., & Schutt, R. K. (2014) also suggested that "The selection technique in Nonequivalent Comparison Group Design can use individual matching, group matching, and aggregate matching used in actual experimental designs." Based on this statement, in this study group selection using group matching was obtained from the Bleep Test pre-test, the results obtained were used as a reference for dividing groups into categories of physical fitness that were verylow and low.

Engel, R. J., & Schutt, R. K. (2014) also suggested that "But the main difference in Nonequivalent Comparison Group Design is that after matching is done, there is no attempt to take advantage of opportunities to randomly place participants into groups." Based on this statement, then in this study, after all participants got the results, and were determined into a group of physical fitness categories that were very low or low, the researcher did not change or include participants in different groups.

This research sample focus to female considering female student number less than male student. We gathering all female student and ask permission to make them our sample also tell them about ten (10) times exercise for increase body defense.

After all, only 12 female student approve and allow to join with our research.

We start with pre-test using Bleep Test to categorize them to very low and low category. Based on result of pre-test we have 6 person bring them to Very Low Group because result of VO₂Max in very low category, and 6 person bring them to Low Group because result of VO₂Max in Low category.

The test conducted is a Physical Fitness Test. Researchers in measuring physical fitness using the Bleep Test. The implementation procedures and test norms and categories of physical fitness will be discussed in the next stage.

Tabel 1. Nonequivalent Comparison Group Design

Group Design			
A	O ₁	X	O ₂
B	O ₁	X	O ₂
C			

Keterangan Tabel 3.1

A = Low Physical Fitness Category Group

B = Very Low Physical Fitness Category Group

C = Body Resistance against Covid Virus 19

X = Treatment with Body Resistance exercise

O1 = Pre-Test

O2 = Post-Test

Materials and Apparatus

We give them treatment 6 times, all treatment using running with different duration, intensity, and repetition. See Table 3.2 to detailed explanation about treatment we used.

Table 2. Treatment

Treatment	Stage 1	Stage 2	Stage 3
t			
Day 1	start with running duration 3	duration 2 minutes 30	running with duration 2

	minutes, intensity max 60% and repetition 5 times, interval 3 minutes	seconds, intensity max 60%, repetition 3 times, interval 3 minutes	minutes, intensity 60%, repetition 2 times and interval 3 minutes.		interval 3 minutes	n 3 times and interval 3 minutes	interval 3 minutes
Day 2	start with 3 minutes 30 seconds, intensity max 60% and repetition 5 times, interval 3 minutes	with duration 3 minutes, intensity max 60%, repetition 3 times, interval 3 minutes,	running with duration 2 minutes 30 seconds, intensity max 60%, repetition 2 times and interval 3 minutes	Day 5	running with duration 2 minutes 30 seconds, intensity max 60%, repetition 2 times and interval 3 minutes	running with duration 3 minutes, intensity max 60%, and interval 3 minutes	running with duration 3 minutes, intensity max 60%, and interval 3 minutes
Day 3	running with duration 4 minutes, intensity max 60%, repetition 5 times and interval 3 minutes	running with duration 3 minutes, seconds, intensity max 60%, repetition 3 times and interval 3 minutes	running with duration 3 minutes, intensity max 60%, repetition 2 times and interval 3 minutes	Day 6	running with duration 3 minutes, intensity max 60%, repetition 2 times and interval 3 minutes	running with duration 3 minutes, intensity max 60%, and interval 3 minutes	running with duration 4 minutes, intensity max 60%, repetition 5 times and interval 3 minutes
Day 4	running with duration 2 minutes, intensity max 60%, repetition 2 times and	running with duration 2 minutes, seconds, intensity max 60%, repetition 3 times and	running with duration 3 minutes, intensity max 60%, repetition 5 times and				

Before the treatment we taken pre-test and after the treatment we taken post-test using Bleep Test.

Procedures

The procedure for implementing the Bleep Test is as follows:

The Bleep Test is carried out by running a distance of 20 meters back and forth, which starts with running slowly gradually getting faster and faster until the testee is unable to follow the rhythm of the run,

meaning that their maximum ability is at the back and forth level.

- a. Time each level 1 minute.
- b. At level 1, a distance of 20 meters is covered in 8.6 seconds in 7 round trips.
- c. At level 2 and 3 a distance of 20 meters is covered in 7.5 seconds in 8 round trips.
- d. At level 4 and 5 a distance of 20 meters is covered in 6.7 seconds in 9 round trips, and so on.
- e. Every 20 meters has been covered, and at the end of each level, you will hear a beep 1 time.
- f. Start is done standing, and both feet behind the starting line. With the signal "ready yes", the testee runs in rhythm to the boundary line until one foot crosses the boundary line.
- g. If the sound signal has not been heard, the testee has crossed the line, but to run back must wait for the sound signal. Conversely, if there is a sign that the testee has not reached the boundary line, the testee must accelerate the run until it crosses the boundary line and immediately returns to running in the opposite direction.
- h. If twice in a row the testee is not able to follow the rhythm of the run, it means that their maximum ability is only at that level and reversal.
- i. After the testee is unable to follow the rhythm of the run time, the testee may not continue to stop, but continue to run slowly for 3-5 minutes to cool down.

Design or Data Analysis

a. Hypothesis Test

1. Test Hypothesis Formulation

H0 = There is no effect of Endurance Exercise on Endurance in the face of the Covid 19 Virus on students penjaskesrek Undana

H1 = There is effect of Endurance Exercise on Endurance in the face of the Covid 19 Virus on students penjaskesrek Undana

2. Test Statistics

Test Statistics used: Paired Sample T Test. Conditions that test statistics must meet: Normal and homogeneous data distribution. The normality test uses Kolmogorov Smirnov while the homogeneity test uses Levene-Statistic. If the data is normal then it can be continued for homogeneity test, but if the data is not normal then it cannot be continued to the next stage, it should be made normal first. After the data is normal and homogeneity test is carried out, the result is obtained that homogeneous data can be used parametric statistical tests using Paired Sample T-Test. If the data is not homogeneous, then a non-parametric statistical test is used using the Two Related Samples Test.

Decision Making Criteria:

If value of Sig. > 0,025 Ho accepted

If value of Sig. < 0,025 Ho denied, and then H1 accepted

*confidence level 95% is 0,05 because two tailed test, so 0,05/2 make the probability value to 0,025.

RESULT

Table 4. Description of Statistical Data

Group		N	Mean
Pre-Test	Very Low Physical Fitness Category Group	6	24,06
	Low Physical Fitness Category Group	6	27,11
Post-Test	Very Low Physical Fitness Category Group	6	26,71
	Low Physical Fitness Category Group	6	29,60

Interpretation:

Based on the results of the analysis of data descriptions using SPSS the results obtained are as shown in Table 4.1. Where the average value of the Pre-Test data for each group of Physical Fitness is Very Low by 24.06 and the Physical Fitness Category is Low by 27.11, while the Post-Test data for each group of Physical Fitness is Very Low by 26.71 and Low Physical Fitness Category 29.60.

Table 5. Validity of Pre-Test Data

VO ₂ Max Pre Test				
VO ₂ Max	Frequency	Percent	Valid Percent	Cumulative Percent
23.2	1	8.3	8.3	8.3
23.6	1	8.3	8.3	16.7
24.0	2	16.7	16.7	33.3
24.8	2	16.7	16.7	50.0
26.0	2	16.7	16.7	66.7
26.8	1	8.3	8.3	75.0
27.2	1	8.3	8.3	83.3
27.6	1	8.3	8.3	91.7
29.1	1	8.3	8.3	100.0
Total	12	100.0	100.0	

Interpretation:

Based on the results of the analysis of data descriptions using SPSS the results obtained are as shown in Table 4.2. Where VO₂Max data obtained from each participant taking the Pre-Test is declared valid.

Table 6. Validity of Post-Test Data

VO ₂ Max Post Test				
VO ₂ Max	Frequency	Percent	Valid Percent	Cumulative Percent
25.2	1	8.3	8.3	8.3
26.4	2	16.7	16.7	25.0
26.8	2	16.7	16.7	41.7
27.2	1	8.3	8.3	50.0
28.0	2	16.7	16.7	66.7
28.7	1	8.3	8.3	75.0
30.6	1	8.3	8.3	83.3
31.4	1	8.3	8.3	91.7
32.4	1	8.3	8.3	100.0
Total	12	100.0	100.0	

Interpretation:

Based on the results of the analysis of data descriptions using SPSS the results obtained are as shown in Table 4.3. Where VO₂Max data obtained from each participant taking the Post-Test is valid.

1. Prerequisite Test

a. Normality test

1) Hypothesis:

Ho = Normal Data Distribution

H1 = Abnormal Data Distribution

2) Decision Making Criteria:

If the Sig. > 0.05, Ma Ho is accepted

If the Sig. < 0.05, then Ho is rejected so H1 is accepted

Table 7. Normality Test Results

Tests of Normality			
	Shapiro-Wilk	Statistic	df Sig.
VO ₂ Max Pre Test	0,949	12	0,61
VO ₂ Max Post Test	0,908	12	0,20

Decision:

Based on the results of the normality test using SPSS with Shapiro Wilk Test, for Pre-Test data obtained Sig. of 0.61 > 0.05 then Ho is accepted. In other words, the Pre-Test Data is normally distributed. Likewise with the normality test results on the Post-Test data obtained by the Sig. of 0.20 > 0.05 then Ho is accepted. In other words, the Post-Test Data

is normally distributed so that both the Pre-Test and Post-Test data successfully pass the first prerequisite test, and then the second prerequisite test is homogeneity test.

b. Homogeneity Test

1) Hypothesis:

Ho = Homogeneous Data Distribution

H1 = Not Homogeneous Data Distribution

2) Decision Making Criteria:

If the Sig. > 0.05, then Ho is accepted

If the Sig. <0.05, then Ho is rejected so H1 is accepted

Table 8. Homogeneity Test Results

Levene's Test for Equality of Variances		
	F	Sig.
Equal variances assumed	0,23	0,63

Decision:

Based on the homogeneity test results using the Levene's Test for Equality of Variances, the Sig. 0.63 > 0.05 so that Ho is accepted. In other words, both Pre-Test and Post-Test data have homogeneous data variance. Therefore, the two prerequisite tests have been fulfilled, namely normally distributed and homogeneous data so that the hypothesis data testing uses parametric statistical tests.

1. Parametric Statistical Test

a. Test of the Effects of Endurance Exercise on the Body's Resilience against Viruses Covid 19 to the student of Penjaskesrek Undana

1) Hypothesis:

Ho = There is no effect of Endurance Training on Endurance against Covid Virus 19 in Penjaskesrek Undana students

H1 = There is an effect of Endurance Training on Endurance against Covid Virus 19 in Penjaskesrek Undana students

2) Decision Making Criteria:

If the Sig. > 0.025 then Ho is accepted

If the Sig. <0.025 then Ho is rejected, so H1 is accepted

* 95% confidence level is 0.05 because of the two-sided test then $0.05 / 2$ so that the probability value becomes 0.025.

Table 9. Effect Test Results

Paired Samples T Test	Sig. (2-tailed)
Pair 1 Pre_test_ - Post_test Low Category	0,010
Pair 2 Pre_test_Post_test_ very Low category	0,000

Decision:

Based on parametric statistical tests using the Paired Samples Test in the Low physical fitness group, the Sig value of Sig. (2-tailed) of 0.010 <0.025 then Ho is rejected, so H1 is accepted. In other words, there is a significant influence of endurance training on body resistance against Covid Virus 19 in Penjaskesrek Undana students.

Likewise, very low physical fitness group, based on parametric statistical tests using the Paired Samples Test, the Sig. (2-tailed) of 0.090 <0.025 then Ho is rejected, so H1 is accepted. In other words, there is a significant influence of endurance training on body resistance against Covid Virus 19 in Penjaskesrek Undana students. Thus, both groups in low physical fitness group and very low physical fitness group increased endurance through endurance training.

DISCUSSION

Based on the results obtained, it will then be discussed regarding the factors that influence, in detail will be explained one by one as follows:

a. Exercise and Sports Factors

Exercise and exercise factors have a great influence on improving one's physical fitness. Kent (in Budiwanto, 2012) that exercise is an exercise program that is planned to help learn skills, improve physical fitness and especially prepare athletes.

Someone who regularly practices according to their needs and obtains physical fitness from him is called trained. Conversely, someone who lets their muscles limp and is in poor physical condition is called untrained. Exercise is the most effective and safe alternative to gain fitness, because exercise has multiple benefits, both physical, psychological, and social benefits.

b. Factors of Healthy Living Habits

Notoadmojo (1993) argues that a healthy lifestyle is basically a response of a person (organism) to a stimulus related to food, personal hygiene, environmental hygiene, habits illness and disease and the balance between work, rest, and Sports.

In order for physical fitness to be maintained, it will not be separated from a healthy lifestyle that must be applied in everyday life by:

- 1) Getting used to eating food that is clean and nutritionally valuable (four healthy five perfect).
- 2) Always maintain personal hygiene such as: bathing with clean water, brushing teeth regularly, cleaning hair, skin, and so on.a) Get enough rest.b) Avoiding bad habits such as smoking, alcoholic drinks, illegal drugs and so on.c) Avoiding the habit of taking medication, except as directed by a doctor.

c. Food and Nutrition Factors

Nutrition is units that compose food or basic ingredients. Notoadmodjo (2003) food serves to maintain body processes in growth or development and replace body tissues damaged, gain energy to carry out daily activities, regulates metabolism and various water, mineral and fluid balances Other bodies also play a role in the body's defense mechanism against various diseases.

While food is something that is bought, cooked, and served as a dish for consumption. Food and nutrition are very necessary for the body to process growth,

understanding damaged body cells, to maintain body condition and to support physical activity. Nutritional needs of each person is influenced by various factors, namely: severity of activity, age, sex, and condition factors. There are 6 elements of nutrients that are absolutely needed by the human body, namely: carbohydrates, proteins, fats, vitamins, minerals and water.

d. Sleep and Rest Factors

The human body is composed of organs, tissues and cells that have limited work ability. Budiwanto (2012) says that after the exercise stimulation stops, the body tries to recover from the origin to restore the energy source that has been reduced and repair the physical damage that has occurred.

A person may not be able to work continuously throughout the day without stopping. Fatigue is one indicator of the limitations of the function of the human body. For this reason, rest is necessary so that the body has the opportunity to recover so that it can comfortably carry out daily activities.

e. Environmental factor

The environment is a place where someone lives for a long time. In this case it certainly concerns the physical and social economic environment. Environmental conditions, work, daily living habits, economic conditions. All of this will be able to affect one's physical fitness.

Basically, the human body has an immune system to fight viruses and bacteria that cause disease. However, there are things that can weaken the immune system or a person's immune system, including aging, malnutrition, disease, and even certain drugs. Therefore, the function of the immune system needs to be maintained so that the immune system is strong. One alternative to increasing the body's immunity is by maintaining physical conditions with training events.

Bafirman and Wahyuri (2018) The formation of physical conditions is a fundamental component in addition to technical, tactical and mental preparation in various Sports.

The exercise in question is an exercise to develop endurance. Endurance training is one of the physical exercises, according to Sukadiyanto (2011) Endurance or (endurance) is the ability of an athlete's body organs to avoid fatigue during sports or work activities for a long period of time. Endurance training is one of the physical exercises that is proven to increase the body's immunity against the virus.

CONCLUSION

Based on the results of data processing and analysis found answers from all the problem formulations in this study. The conclusions from the answers are as follows:

1. Low physical fitness group there was a significant influence of Endurance Training on Endurance against the Covid Virus 19 in the Penjaskesrek Undana student.
2. Very Low physical fitness group, there was a significant influence of Endurance Training on Endurance against the Covid Virus 19 on the Penjaskesrek Undana student significantly.

Thus, both groups Low physical fitness group and very Low physical fitness group increase in endurance through endurance training that indicates the existence of body resistance for face the Covid Virus 19.

The limitations of this study include:

1. The sample used is only 12 . female students from Penjaskesrek Undana
2. The treatment that should have been carried out eight times due to the national

situation, namely the COVID-19 pandemic, was only carried out six times.

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All Acknowledgments (If Any) Should Be Included At The Very End Of The Paper Before The References And May Include Supporting Grants, Presentations, And So Forth.

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