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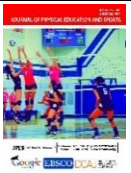

The Acute Effects of *Sport Massage* on Decreased Heart Rate After Exercise (Case Study on Psht Pencak Silat Athletes in Karangsambung)

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Abstract

Physical activity directly affects the cardiovascular system, both acute and chronic effects. The acute effect of physical exertion is an increase in heart rate. This increase needs to be lowered so that the body returns to its original condition. The purpose of this study was to determine the effect of acute sport massage on the speed of pulse rate reduction after exercise. Method used in this study is quasi-experimental. Quasi experiment with one grou pre-test and post-test research design, the sample is a popda pencak silat athlete psht karangsambung district. The data collection technique used a side kick test for 1 minute as many as 40 kicks, and was calculated using a digital tension meter and stopwatch. Then massage will be given for 20 minutes on the gastrocnemius repetisis muscle movement 3-5 times. Data were analyzed using paired sample t-test the pre-test and post-test mean values were 20.167, the standard deviation values were 9.094, t tables were 7.682, degrees of freedom were 11, and p values were 0.000. The results of the research data show a p value of 0.000, then the p <0,05, therefor H0 is rejected and Ha accepted. The results of this study showed that sports massage given for 20 minutes to the gastrocnemius muscle after physical activity affected the rate of lowering heart rate in athletes.

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INTRODUCTION

Sport is a conscious body movement activity that aims to gain physical and spiritual health and fitness. Sport is physical activity or a series of movements carried out in a structured and planned manner where a person does it in a conscious state and aims to improve functional abilities (Mubarak et al., 2020). Sports can be done by anyone and anywhere. Sports or physical exercise carried out will have an effect on cardiovascular either acute effects or chronic effects (Sandi, 2016b). This acute effect in physical activity is an increase in the heart rate in the body.

Heart rate is a wave that arises due to the pumping of blood that will be released from the heart to be circulated throughout the body (Kasenda et al., 2014). Pulse is a wave felt in the arteries as a result of the heart's performance in pumping blood out of the heart to be spread to all parts of the body (Sandi, 2016a) meaning that the blood produced is blood that contains a lot of Oweverence.

heart rate is the number of times the heart beats in one minute and can be measured to evaluate the intensity of physical activity and heart health. The higher the physical activity performed, the more pulse rate and increased heart performance (Farland et al., 2015). When doing high-intensity physical activity, the heart rate will increase because the heart has to pump more blood to meet the higher demand for oxygen and nutrients in active muscles.

Pencak silat is one of the original sports from Indonesia that has existed since the colonial era (Suhardinata & Indrahti, 2021). Many enthusiasts from this sport both young and old, children, teenagers, women and men make the existence of pencak silat increase and give birth to great athletes. In pencak silat there is a sparring category where this match is carried out for 3 rounds and one round is carried out for 2-3 minutes of combat (Munas IPSI XII, 2007). Matches in pencak silat are carried out with fairly fast movements and high intensity, this makes athletes will easily experience fatigue.

The frequency of physical activity that is high enough will make the body need a lot of oxygen (O2) and produce a lot of waste substances in the body, one of which is lactic acid. Fatigue can be caused by the energy metabolism system in the body with the buildup of lactic acid in the muscles that disrupt the mechanism of muscle cells (Supriatna, 2020). Sports activity increases, the performance of the metabolic system also increases by providing energy in response to increased body performance. High-intensity exercise requires the provision of energy by anaerobic glycolysis with the final product in the form of lactic acid (Bulu Baan et al., 2021).

This increased amount of lactic acid causes muscle pain, discomfort, rapid heartbeat, and causes effects such as shortness of breath on the athlete's body. The buildup of lactic acid in the muscles makes the decrease or recovery of pulse rate also slow (Syaefulloh Ivan &; Purbodjati, 2022)Thiscan be overcome in several ways such as cooling. Cooling done afterdoing physical activity done after competing or doing activities can help athletes recover (Mubarak et al., 2020). Cooling down can also help athletes in reducing muscle fatigue experienced by athletes. Cooling is useful to help muscles to relax from tension that occurs after activity. In addition to using cooling, another intervention that can be used to help the recovery process in athletes is to use massage (Mubarak et al., 2020). Sport massage can help the recipient become more relaxed because massagecan help relax and stretch muscles and soft tissues in the body and is able to provide stimulation and increase the activity of muscles, blood vessels and glands regulated by the muscles (Jordy. Becker: 2007).

Sport massage is a manipulation that uses the hands to stimulate, relax, and relieve tension or excessive tension in someone (Muhaimin, 2018). In addition, other benefits of massage are to help in handling injuries, and accelerate the body's recovery process, facilitate blood circulation, overcome stress, increase body flexibility, reduce anxiety, and eliminate lactic acid that accumulates in the muscles after

treatment. After exercise or exercise, it is important to lower the heart rate back to normal levels quickly and effectively as part of post-workout recovery (Delextrat et al., 2013). This is because a high heart rate after exercise or exercise can indicate that the body is still in a burdened state and still needs more time for recovery. Based on this and the vision and mission of sports science in advancing science and technology, the author intends to conduct research on "the effects of acute sports massage effleurage, petrissage, and shaking on the speed of heart rate reduction in PSHT pencak silat athletes in karangsambung".

METHODS

The scientific method is a way to obtain data for pre-planned purposes and results. This type of research is quantitative with the method used is quasi-experimental. Quasi-experimentation is a research method in which random assignments are not used, but use existing groups and because researchers are unable to control all variables that affect it. Pretest-posttest control group design, samples will be made 1 group will receive massage. The heart rate will be taken using a digital tension gauge and stopwatch.

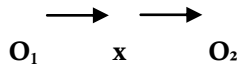

Figure 1. Research Design, Quasi experimental One group pre-test post-test design
Source: quantitative, qualitative, R&D research methods (Sugiyono, 2013: 75)

Description:

O_1 = Pre-test (test carried out before the sports massage treatment is given) 40 side kicks or C kicks are tested in 1 minute.

X = treatment (Giving sports massage to the gastrocnemius muscle) for 20 minutes, repetition of movements 3-5 times.

O_2 = post-test (a test performed after a treatment massage is given) a side kick or C kick test is performed for 1 minute with 40 kicks.

RESULTS

Table 1. Sample Characteristics Data

Variable	Sample (n) Mean±SD.	Min-Max
Age (yr)	14.9 ±1.8	12-18
Height (cm)	159.8±8.032	148-172
Weight (kg)	50.42± 8.597	42-70

Based on Table 1, it shows that the sample characteristics have a minimum age of 12 years and a maximum age of 18 years, with a mean±Std. Deviation of 14,9 ± 1,8 years. The minimum height is 148 cm, and the maximum height is 172 cm, with a mean±Std. Deviation of 159,8 ± 8,32 cm. The minimum weight is 42 kg, and the maximum weight is 70 kg, with a mean±Std. Deviation of 50,42kg±8,597.

Table 2. pre-test and post-test data results

No	Subject Name	Pulse		D
		Pre-Test	Post-Test	
1.	M.E.D.A	127	110	17
2.	R.Z.M	115	98	17
3.	A.F.H	145	112	33
4.	S.Y.H	135	105	30
5.	Z.A	108	88	20
6.	A.R	115	110	5
7.	D.P	130	114	16
8.	S.S	131	113	18
9.	I.O	128	117	11
10.	P	134	108	26
11.	R	117	82	35
12.	D	110	96	14

The table below is a table of research results on the sample. Pre-test data is the initial heart rate data taken after the athlete performs C kick test for 1 minute as many as 40 kicks without being given massage. While post-test data is heart rate taken after athletes are given massage and do the same physical activity.

Table 3. Normality Test

No	normality test	df	p
1	Pre-Test	12	0.585
2	Post-Test	12	0.117

The normality test was carried out before data analysis to see whether the distribution of data was normally distributed or not, in this study using the Shapiro-Wilk test. The normality test carried out obtained significant data in the pre-test was 0.585 then p> 0.05, then for the post-test data the significance was 0.117 then p> 0.05 from the results obtained p> 0.05 which means the data is normally distributed. After getting the results of the normality test, the data is then tested using the homogeneity test which aims to test the similarity of the variants. The following is the result of the homogeneity test using Levene.

Table 4. homogeneity test

No	Levene test		p
1	Pre-Test	0.109	0.748
2	Post-Test	0.450	0.517

Table 4 explains the results of the homogeneity test using the Levene test with pre-test and post-test values having a value of p = 0.748 for the pre-test value and p = 0.517 for the post-test, which means that the value (P> 0.05), so that the variance of the data pre-test and post-test have homogeneous data. With these results it can be concluded that the data variable is homogeneous because it has a p value> 0.05. The next step is hypothesis testing. This hypothesis testing uses a paired sample T-Test.

Table 5. Test sample paired T- test

Paired sample T-Test	Mean ± Std.Deviation (N=12)	t	Df	P (sig.)
	Pre-Test & Post-Test			
	20.167 ± 9.094	7.682	11	0.000

The table 5 above has a pre-test - post-test mean value of 20.167, a standard value of division of 9.094, t table of 7.682, a degree of freedom of 11, and a p value of 0.000. This shows a significant effect of the acute effect of sports massage on the heart rate. The result of the above data shows a p value of < 0.05, therefore H0 is rejected and Ha is accepted. This shows a significant effect of the acute effect of *sports massage on the* heart rate of reduction in athletes after exercise.

DISCUSSION

Based on the results of the study using the side kick physical test method, it showed that the 12 subjects studied received a post-test score that was lower than the pre-test score. The pulse is a wave that is palpable in the arteries when the heart is pumping blood to spread throughout the body (N. T. Purnomo, 2014). Pulse recovery needs to be done after doing physical activity, so that the body can return to its original state (Sandi, 2016a). The faster the pulse recovery, the better one's health and fitness. Conversely, the longer the pulse takes to recover, it indicates a person's condition is not good.

The physical test used aims to raise the subject's pulse to a training pulse. The role of researchers, coaches and assistant coaches at the athlete training ground in Karangsambung sub-district is to accompany athletes in the activity process and provide examples before carrying out activities, so that athletes understand and can understand the rules of research well.

The activity went well and smoothly, all athletes were able to do side kicks properly and with the specified number of kicks. Pre-test and post-test data collection activities were carried out on different days, this was done so that the conditions of the subjects remained consistent as at the beginning of data collection. The results of the research obtained get different pulses, this is a natural thing because one person's physical condition and fitness will be different from others.

Based on the results of these studies, sports massage can help restore the pulse rate in athletes faster, the benefits of massage are in relaxing tense muscles, promoting blood circulation and helping the recipient recover

faster (A. M. I. Purnomo, 2016). The results of the study on 12 research subjects showed that sports massage can be used to help restore the pulse rate quickly, this is evidenced by the decrease that occurred in all subjects after receiving interventional massage for 20 minutes on the gastrocnemius muscle.

Based on the discussion above, the results of the data analysis show that the hypothesis is accepted because the pre-test and post-test values have a significant difference with a decrease in the subject's heart rate, meaning that there is an acute effect of sport massage on the speed of decreasing heart rate after training in Psht pencak silat athletes in Karangsambung.

CONCLUSION

The results of this study indicate that sports massage given for 20 minutes to the gastrocnemius muscles after physical activity has an effect on the rate of decrease in heart rate in athletes. This is indicated by the difference in the results of the pre-test and post-test data which decreased in each subject. From the Paired Sample T-test, the mean pre-test and post-test values were 20.167, the standard deviation value was 9.094, the t table was 7.682, the degrees of freedom were 11, and the p value was 0.000. p<0,05.

The above discussion of the results of data analysis shows that the hypothesis is accepted because the post-test value is lower than the pre-test value, it can be concluded that there is an Acute Effects Of Sport Massage On Decreased Heart Rate After Exercise in Psht pencak silat athletes, Karangsambung, Kebumen district.

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