



The Effect of Mix Impact Aerobic Exercise on Cardiovascular Improvement at Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) Community

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Article Info

Article History :

Received : September 2022

Revised : September 2022

Accepted : September 2022

Keywords:

Mix Impact, Aerobic
Exercise, Cardiovascular

Abstract

The circulatory system or cardiovascular system is an organ system that functions to move substances to and from cells. The term cardiovascular ability has the same meaning as several other terms such as cardiac endurance, aerobic fitness, and cardiorespiratory endurance. In the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community, there is a lack of physical activity, a lack of application of the right time to do sports and less precise in choosing sports exercises that can improve cardiovascular. Because the members need to have good cardiovascular endurance to support daily activities. This type of research is an experimental research with a one group pre-test post-test design. The instrument used is the Harvard step test. The population in this study were the entire Senam Pagi Sungai Kambang Ceria (PSPSKC) community which amounted to 64 people. Sampling in this study using purposive sampling technique, namely the technique of determining the sample with a specific purpose. The sample in this study were 10 people from the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community aged 20-30 years. The results of the research on the initial test (pre-test) got an average result of 57.3 while in the final test (post-test) it was 65.3. Meanwhile, from the results of hypothesis testing using the t-test, the results of $t(4.457) >$ from the t value (1.833) with a significance level of $= 0.05$ (5%). From these data, it can be concluded that there is a significant effect of Mix Impact aerobic exercise on cardiovascular improvement in the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community.



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INTRODUCTION

Gymnastics is one of the sports that people are interested in, especially in Jambi Province at this time (Setiawan et al., 2022). This can be seen from every institution, schools and other universities that often carry out morning gymnastics activities, these exercises are often carried out on Friday mornings and Saturdays because there is a lot of empty in the morning and evening. It's perfect for weekdays or weekends (Kusuma & Setyawati, 2016).

All sports that move have very many benefits for our bodies and have their own goals according to the type of sport, but in general sports that use the heart, lungs and blood circulation systems effectively and efficiently will increase the ability of cardiovascular endurance (Collins et al., 2017). For carrying out continuous work that involves muscle contractions with high intensity for a long time, the body will have a higher oxygen intake which is good for blood circulation, weight loss, burning calories and fat faster. Gymnastic exercises such as aerobics can also be called cardio training because this exercise focuses on improving the function of the cardiovascular system (heart and blood vessels) and is influenced and has an impact on the quality of the cardiovascular, respiratory and circulatory systems (Agus, 2012). Cardiovascular in general is the ability of the heart, lungs and blood vessels to function optimally at rest and at work in taking oxygen and distributing it to active tissues so that it can be used in metabolic processes (Fikriana, 2018).

Gymnastics that is included in sports that are more beneficial for the cardiovascular system is aerobic exercise (Oja et al., 2017). This exercise can also make the cardiovascular system improve and become fit and increase cardiovascular endurance. Because in gymnastics there are movements that can be created

according to the abilities needed and according to the systematics of the gymnastic cycle, where each movement in each phase of the cycle has great benefits to make cardio vascular good (Zhang et al., 2017).

With the above explanation and theory behind the author to conduct experimental research using aerobic exercise with benefits that in addition to physical fitness, this exercise is also beneficial for cardiovascular fitness and the author uses the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community as a sample. According to a survey conducted by the head of the members, there is a lack of physical activity, the lack of proper timing for doing sports and less precise in choosing sports exercises that can improve cardiovascular, because the members need to have good cardiovascular endurance, Therefore, the author argues that by doing regular exercise, it can increase the cardiovascular endurance of the prison members, so to realize the explanation above, it is necessary to socialize about good and correct exercise in the Senam Pagi Sungai Kambang Ceria (PSPSKC) community. So, one of the reasons behind the author choosing female members as a sample is because their eating cycles, nutritional dosages, and lifestyles are almost 89% the same, so that it has a big influence on the success of the author's final research results which draw a title "The Effect of Mixed Aerobic Gymnastics. Impact on Cardiovascular Improvement for Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) Community".

METHODS

The type in this study is an experimental study where this research requires treatment of a group that does aerobic exercise where the group did two

tests, namely the initial test and the final test before and after being given treatment/exercise and the design of this study was an experimental study in the form of a one-group design. Pretest posttest design, namely research with one group of subjects who are treated/interventions that are measured before and after treatment in one group (Gazali, 2022).

Participant

(Gazali, 2022), states that the population is the entire object of research consisting of humans, objects, animals, plants, symptoms, test scores, or events as data sources that have certain characteristics in a study. In a study there is always an object or subject that is the target of research, which is called the population. The population in this study were all women members at the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community, amounting to 64 people.

Sampling Procedure

The sample is part or representative of the population under study stating that

the sample is part of the number and characteristics possessed by the population (Gazali, 2022). Based on the population above, the sampling in this study used a purposive sampling technique, the number of samples used in this study were 10 female members in the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community, aged 20-30 years.

RESULT AND DISCUSSION

Research result Data Description

This section discusses the description of the research data, namely the data on the initial test (pre-test) and the data after being given treatment, namely the final test (post-test).

1) Initial Test Data

The description of the data in this section is to describe the data on the initial test, namely before the treatment (treatment). The data was taken with a test instrument in the form of a Harvard step test, namely a bench-up and down test. The following will explain the initial test data (pre-test) in the data table below:

Table 1. Description of the Pre-Test Data for Cardiovascular Scores Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community.

| Data | Sample | Quantity | Average | Sd | Varians | Highest Score | Lowest Score |
|----------|--------|----------|---------|------|---------|---------------|--------------|
| Pre-test | 10 | 573 | 57,3 | 5,64 | 31,79 | 68 | 50 |

From table 1 above, it is known that during the pre-test with a sample of 10 people, the total score was 573, the average value was 57.3. Then the results of the calculation of the standard deviation of 5.64 with a variance of 31.79 and the lowest value of 50 and the highest value of 68. From these data, the frequency distribution table will be presented as follows:

Table 2 Frequency Distribution of Initial Test Results Cardiovascular Score Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community

| No | Interval Class | Frequency | Percentage | Category |
|-------|----------------|-----------|------------|-----------|
| 1 | > 90 | 0 | 0 % | Very Good |
| 2 | 80-89 | 0 | 0 % | Good |
| 3 | 65-79 | 1 | 10 % | Adequate |
| 4 | 55-64 | 6 | 60 % | Less |
| 5 | < 54 | 3 | 30 % | Very Less |
| Total | | 10 | 100 % | |

Based on table 2 above, the scores of the initial Harvard step test scores for female members who scored in the good and very good category were 0 or none, and 1 person (10%) had an adequate score with an interval of 65-79. get a score of less category as many as 6 people (60%) with a value interval of 55-64, who get a very bad category score as many as 3 people (30%) with an interval of value < 54. Below will be presented histogram analysis of the initial test Harvard step test female members:

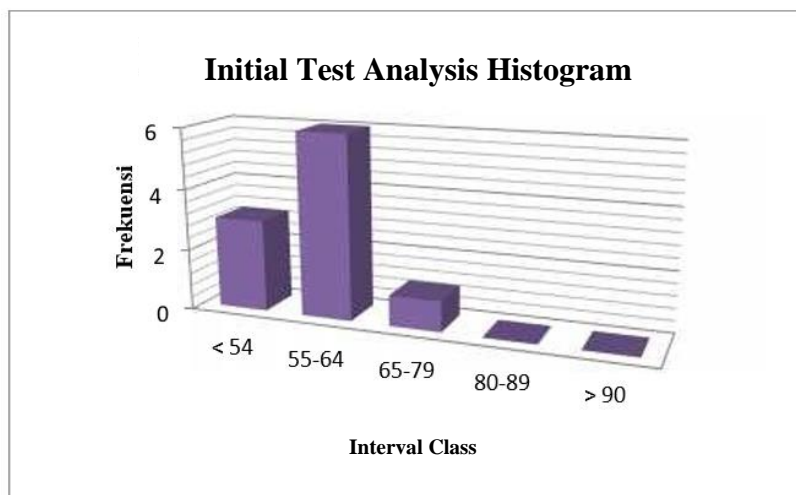


Figure 1. Histogram of Initial Test Frequency Analysis Cardiovascular Score Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community.

2) Final Test Data

The data that will be explained in this section are data obtained from the Harvard step test of female correctional members after being treated with Mix Impact aerobic exercise, with a sample of 10 people, which researchers hope to have an effect on cardiovascular improvement. Then the calculation of the average, the number of values / motivation scores, standard deviation, lowest value, highest value, interval and variance will be carried out. The following describes the overall results of the data from the final test in the table below:

Table 3. Description of the Cardiovascular Score Final Test Data for the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community.

| Data | Sample | Quantity | Average | Sd | Varians | Highest Score | Lowest Score |
|-----------|--------|----------|---------|------|---------|---------------|--------------|
| Post-test | 10 | 653 | 65,3 | 8,31 | 69,12 | 77 | 52 |

From table 3 above, it can be seen that the distribution of data at the time of post-test with a sample of 10 people, obtained a total score of 653 and an average value of 65.3. The results of the standard deviation of 8.31 with a variance of 69.12 and the lowest value of 52 and the highest value of 77. From these data, the frequency distribution table will be presented as follows:

Table 4. Frequency Distribution of Final Test Results Cardiovascular Score Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community.

| No | Interval Class | Frequency | Percentage | Category |
|----|----------------|-----------|------------|-----------|
| 1 | > 90 | 0 | 0 % | Very Good |
| 2 | 80-89 | 0 | 0 % | Good |
| 3 | 65-79 | 5 | 10 % | Adequate |
| 4 | 55-64 | 4 | 60 % | Less |
| 5 | < 54 | 1 | 30 % | Very Less |
| | Total | 10 | 100 % | |

Based on table 4 above, the score data for the final Harvard step test female members who get a good and excellent category score are 0 or none, with an interval of 80-89 and > 90, who get a sufficient category score of 1 person. (10%) with an interval of 65-79, who got a score of less categories as many as 6 people (60%) with an interval of 55-64, who got a very high category score. 3 people (30%) bad with a score interval of <54. Below is a histogram of the analysis of the Harvard final test step test for female correctional members:

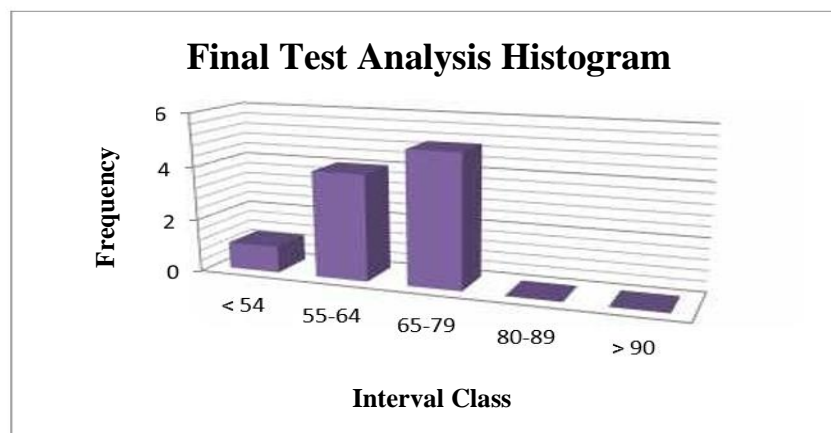


Figure 2. Histogram Analysis of the Final Test Frequency Cardiovascular Score Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community

a. Research Data Analysis

In this study using t-test analysis to test the research hypothesis. Before conducting the t-test analysis, the data analysis of the normality test and the homogeneity of variance test was carried out first, then a hypothesis test was carried out using the t-test.

Data Normality Test

Before testing the hypothesis, the data normality test was conducted to determine whether the research data obtained were normally distributed or not. The normality test used is the Lilliefors test. With the data criteria if $Lo (L) < L$, then the data normally distributed. Based on the normality test of the initial and final tests using the Lilliefors test, the following results were obtained:

Table 5. Normality Test of Initial and Final Test Results Cardiovascular Score Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community

| Data Source | L | L | Criteria |
|-------------|--------|-------|----------|
| Pre Test | 0,1681 | 0,258 | Normal |
| Post Test | 0,1665 | | Normal |

Based on table 5 Normality Test of the results of the initial test and the final test of the Harvard step test scores of female members, the data shows that the results of the analysis obtained the Lo value for the initial test data of 0.1681 and the final test of 0.1665 $< L$ table of 0.258. So It can be concluded that the initial test data and the final test scores of the Harvard Step Test female members were normally distributed.

Variance Homogeneity Test

The homogeneity of variance test is used to see the data in homogeneous or non-homogeneous research. In this study, the formula used to test the homogeneity of variance is the F test with the data criteria stated if $F_{count} < F_{table}$, then the data is homogeneous.

Table 6. Homogeneity Test of Initial and Final Tests of Cardiovascular Scores for the Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community

| Source of Varians | Fcount | Ftable | Criteria |
|---|--------|--------|-------------|
| Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community cardiovascular score | 2,17 | 3,18 | Homogeneous |

Based on the analysis of the F test, the F_{count} value in the initial and final test data is 1.28. With dk in the numerator (df) $n-1 = 9$ dk in the denominator $n-1 = 9$ at the significance level = 0.05 then F_{table} is 3.18 so $F_{count} (2.17) < F_{table} (3.18)$ so it can be stated that the initial test data and the final test cardiovascular score for female members are homogeneous.

Hypothesis Test (t-test)

After testing the normality and homogeneity of variance, then the hypothesis is tested using the t-test based on the data obtained from the initial test and the final test at

the time of conducting the research. Then the data obtained will be processed and analyzed statistically. The decision-making criteria with the t-test are:

if $t < t$, then H_a is rejected, H_o is accepted provided that the data is not significant.

If $t > t$, then H_a is accepted, H_o is rejected with significant data provisions.

The data used in the calculation of the t-test is pre-test data and post-test. The results of the t-test calculation can be seen as follows:

Table 7. Hypothesis Testing of Initial and Final Test Results Cardiovascular Scores for Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community

| Data Source | t | t | Description |
|-------------|-------|-------|--------------|
| Pre-test | 4,457 | 1,833 | Significance |
| Post-test | | | |

From the calculation of the t-test in the table above, it can be obtained data t of 4.457 and t of 1.833. Determining the value of t in the following way: for the significance level = 0.05, and the degrees of freedom (db) = $10 - 1 = 9$, the value of $t = 1.833$ is obtained. Determining the value of t by means of statistical calculations using the t-test, then the t-value is 4.457. After knowing the value of t and t, then it can be concluded that H_a is accepted, H_o is rejected because the value of t (4,457) > from t value (1,833). So it means that there is an effect of Mix Impact aerobic exercise on cardiovascular improvement in Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community

This discussion will explain the results of cardiovascular scores obtained from the initial test and the final test using an instrument in the form of a harvard step test which has been analyzed on the research data. Prior to the final test, the sample in this study was given treatment in the form of mix impact aerobic exercise which was carried out 16 times with a frequency of exercise 3 times a week and a treatment duration of 40 minutes. This research was conducted on female members at penggemar senam pagi sungai kambang ceria (pspskc)

community, whose samples were 10 women. Researchers chose the field as a place of research because they wanted to know whether the members had a circulatory system blood (cardiovascular) is good, because there are not many physical sports activities such as this mix impact aerobic exercise which is carried out at the correctional institution.

At the time of the initial test, the average cardiovascular score of the sample was 57.3, which was included in the less category. Then after the treatment (treatment) in the form of mix impact aerobic exercise a final test was carried out with the average cardiovascular score of the sample rising to 65.3 which was included in the sufficient category. This proves that mixed impact aerobic exercise can improve the cardiovascular system or the working system of the blood circulation to transport substances to and from body cells such as oxygen and food extracts and recover from physical activity (fikriana, 2018). This is because the mix impact aerobic exercise is an activity that is carried out in an organized manner, planned to get as much oxygen into the body as possible and aims for endurance and body formation. Endurance is formed, especially the endurance of the heart which is in charge

of pumping blood throughout the body. To test the hypothesis that has been proposed previously in chapter ii, namely that there is an effect of mix impact aerobic exercise on cardiovascular improvement in the penggemar senam pagi sungai kambang ceria (pspskc) community, a hypothesis test analysis was carried out with a t-test but previously tested the data analysis requirements using the normality test. (lilliefors test) and the homogeneity of variance test. Each of the results shows that the research data is normally distributed and homogeneous. Because the low value for the initial test data is 0.1681 and the final test is 0.1665 < t_{table} of 0258 then the data is normally distributed. While the value of f_{count} (2.17) < f_{table} (3.18) then the data is homogeneous.

Intrinsic Factor

Based on the t-test analysis that has been carried out on the initial test data and the final test data, the t_{count} value is 4.457, when compared to t_{table} of 1.833, the t -value (4.457) > from the t -value (1.833) shows that there is a significant influence on the effect of aerobic exercise. Mix impact on cardiovascular improvement of Penggemar Senam Pagi Sungai Kambang Ceria (PSPSKC) community.

CONCLUSION

The results of the study on the effect of mixed impact aerobics on cardiovascular improvement in the penggemar senam pagi sungai kambang ceria (pspskc) community, it can be concluded that the average scores for the initial and final tests as well as the standard deviations of the initial and final tests have increased significantly. Based on the results of the t-test that the t -value is 4.457 > t -value is 1.833 with a significance level of 0.05 so that there is

a significant influence on the effect of mixed impact aerobics on cardiovascular improvement in the penggemar senam pagi sungai kambang ceria (pspskc) community. conclusions of the work highlighting its importance and relevance.

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