COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 ‖ Volume 17, Number 1, 2025 ‖ P.145-152
DOI: 10.26858/cjpko.v17i1.70787

How is the Muscle and Cardiovascular Endurance Level of Players In The Patalassang Football Association (PERSEPAT FC)

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ABSTRACT

This study aims to determine the level of muscle and cardiovascular endurance of Patalassang Football Association (PERSEPAT FC) players. The method used in this study is a survey with data analysis techniques using SPSS 21. The research sample consisted of 10 PERSEPAT FC players. The results of the analysis showed that the level of muscle endurance of PERSEPAT FC players based on Table 4. 3 had the following distribution: 2 people (20%) were in a good category, and 8 people (80%) were in the fair category. Meanwhile, the results of the analysis of cardiovascular endurance levels based on Table 4.4 show that 2 people (20%) are in the very poor category, and 8 people (80%) are in the poor category. These findings indicate that the majority of players have a sufficient level of muscle endurance, but cardiovascular endurance is still relatively low. Therefore, a more focused training program on improving cardiovascular endurance is needed to improve players' physical performance.

ARTICLE HISTORY
Received: 2025/02/10
Accepted: 2025/02/16
Published: 2025/02/25

KEYWORDS
Muscle;
Cardiovascular;
Endurance;
Football.

AUTHORS' CONTRIBUTION
A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article : Hasmyati, Hasmyati; Anwar, Nur Indah Atifa. (2025). How is the Muscle and Cardiovascular Endurance Level of Players in The Patalassang Football Association (PERSEPAT FC)? **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 17 (1), p.145-152

INTRODUCTION

According to the National Sports System Law, "Sports is a systematic activity to encourage, foster, and develop physical, spiritual, and social potential" (Lenkana & Sofa, 2017). Sport brings individuals and communities together, highlighting commonalities and bridging cultural or ethnic differences. Sports provide a forum to learn skills such as discipline, confidence, and leadership and teach core principles such as tolerance, cooperation, and respect (Ginting, 2024). Sport teaches the value of effort and how to manage wins and losses.

Exercise is a physical activity that plays an important role in improving physical fitness and supporting overall body health (Ilyas et al., 2024). One of the most popular sports in the world, including in Indonesia, is football. Football is a sport that requires a combination of technical skills, tactics, and excellent physical condition. In the game of

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football, every player is required to have good endurance to maintain optimal performance throughout the match (George et al., 2019).

Muscle endurance and cardiovascular endurance are two very important aspects of fitness in football. Muscle endurance refers to the ability of a muscle to work for a long time without experiencing significant fatigue (Rustiawan & Rohendi, 2021). In the game of soccer, muscle endurance is needed, especially when sprinting, dribbling, passing, and kicking the ball repeatedly. Players who have good muscle endurance will be able to maintain their physical strength and technical performance until the end of the match (Al Huzaimy, 2020).

In addition to muscle endurance, cardiovascular endurance is also a major factor in supporting the performance of football players. Cardiovascular endurance is related to the ability of the circulatory and respiratory systems to supply oxygen to muscles during physical activity (Ramadhan et al., 2021). Football is a high-intensity sport that involves constant movements such as running, walking, and sprinting for a relatively long time. Therefore, players with good cardiovascular endurance will be better able to maintain the intensity of the game without experiencing rapid fatigue. These two fitness components are interrelated in supporting the performance of football players (Wani & Wea, 2021). Optimal muscle endurance allows players to stay strong in repetitive movements, while good cardiovascular endurance ensures a sufficient supply of oxygen so that the body does not get tired quickly. Thus, a survey regarding the level of muscle endurance and cardiovascular fitness of Patalassang Football Association (PERSEPAT FC) players is important to find out the extent of the players' physical condition in supporting their performance on the field. The results of this survey are expected to be the basis for developing a more effective training program to improve the team's overall fitness and performance.

METHODS

This study uses a descriptive survey method to measure the level of muscle and cardiovascular endurance of Patalassang Football Association (PERSEPAT FC) players. The sample used in this study was 10 players from the PERSEPAT FC team who were selected by purposive sampling (Pasaribu, 2020). There is only one variable in this study, namely the results of the Muscle and Cardiovascular Endurance test of Singkeru Rukka BC players where the variables are not manipulated and only collected data according to the field. Based on this identification, the research variables are defined operationally as follows (Atty et al., 2024): 1. Muscle Endurance is the ability of muscles to perform a repetitive task or contract at the same time. To find out the level of muscle endurance, you can do it by giving Push-Up exercises for 1 minute. 2. Cardiovascular Endurance is the ability of the heart and lungs to supply oxygen throughout the body for a long time and cardiovascular endurance is a major component in physical fitness. To find out the

level of cardiovascular endurance, you can do it by giving a 12-minute running test exercise.

The data analysis technique from the research results obtained is then analyzed quantitatively following the data analysis technique that has been determined by the researcher (Ilyas et al., 2024). The data in this study was analyzed using:1.Descriptive analysis is intended to get an overview of the research data referring to the normality standard (P>0.005). 2. The data presentation test was included to obtain research data to interpret and give meaning to the measurement data of muscle and cardiovascular endurance levels using statistical analysis techniques using computer assistance using the SPSS program. Furthermore, the meaning will be carried out as a discussion of the problems proposed by referring to the standard of muscle and cardiovascular endurance levels that have been determined.

$$P = \frac{F}{N} x\ 100$$

Information:

P= Percentage figure
F= Frequency that is being sought percentage
N= Number of case (jumlah)

The data obtained from the measurement results were then analyzed with descriptive statistical techniques to determine the distribution and fitness level of the players. The results of this study will be used as a basis for planning a more specific training program to improve the physical performance of PERSEPAT FC players.

RESULTS AND DISCUSSION

Result

To get an overview of the data of a study, descriptive data analysis was used on the data of the Muscle and Cardiovascular Endurance Level Survey of Patalassang Football Association Players (PERSEPAT FC). This is intended to give meaning to the results of the analysis that has been carried out. The results of the descriptive analysis of the data can be seen in the following table:

Table 1.
Results of descriptive test data of the Survey of Muscle and Cardiovascular Endurance Levels of Patalassang Football Association Players (PERSEPAT FC).

Variable	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Muscle Endurance	10	23.00	12.00	35.00	184.00	18.4000	6.81828	46.489
Cardiovascular Endurance	10	3.25	1.25	4.50	17.30	1.7300	.97929	.959

The table above is a descriptive description of the variables of the results of the descriptive analysis of the Muscle and Cardiovascular Endurance Level Survey of Patalassang Football Association Players (PERSEPAT FC). The results in the table above are more detailed as follows:

1. From the muscle endurance data N/sample 10, Range/distance 23.00, minimum value 12.00, maximum 35.00, Sum/total 184.00, Mean/average value 18.4000, Standard deviation/standard deviation (s) 6.81828 and variance 46.489.
2. From the cardiovascular endurance data N/sample 10, Range/distance 3.25, minimum value 1.25, maximum 4.50, Sum/total 17.30, Mean/average value 1.7300, Standard deviation/standard deviation (s) 97929 and variance 959.

One of the assumptions that must be met for parametric tests to be used in research is that the data must follow the normal distribution, so a data normality test is carried out. Data normality testing can be carried out to find out whether the data obtained in the research results is in a normal distribution. Data normality testing can be done with the Kolmogorov-Smirnov test.

The criteria for stating whether the data from the sample used are normally distributed or not can be done by comparing the Sig coefficients. Or a P value of 0.05 (Significant level). If the P value is greater than 0.05 (significance level), it means that the data comes from a normally distributed population. On the other hand, if the P-value is less than 0.05, it means that the data comes from an abnormally distributed population.

Table 2.
Results of Testing the Normality of Variable Data Survey of Muscle and Cardiovascular Endurance Levels of Patalassang Football Association Players (PERSEPAT FC)

Variable	Absolute	Post	Denied	KS-Z	Asymp.Sig	A	Information
Muscle Endurance	0.323	0.323	-0.174	1.023	0.247	0.05	Normal
Cardiovascule endurance	0.473	0.473	-0.312	1.495	0.223	0.05	Normal

Based on the table of data normality test results using the Kolmogorov Smirnov Test above, the results for each variable of the Muscle and Cardiovascular Endurance Level Survey of Patalassang Football Association Players (PERSEPAT FC) can be known as follows:

1. From the muscle endurance data, absolute values of 0.323, positive 0.323, negative -0.174, Kolmogorov-Smirnov 1.023, *Asymptot. Sig* 0.247 (P>0.05), then it can be said that the data follows a normal or distributed distribution because the KS-Z value obtained is greater than 0.05 (significant level) which is 1.023 >0.05 and the Asymp value sig 0.247 means that the muscle endurance data is normally distributed.
2. From the cardiovascular endurance data, absolute values were obtained 0.473, positive 0.473, negative -0.312, Kolmogorov-Smirnov 1.495, *Asymptot. Sig* 0.223 (P>0.05), then it can be said that the data follows a normal or distributed distribution because the KS-Z value obtained is greater than 0.05 (significant level) which is 1.495 >0.05 and the Asymp sig value of 0.223 means that the cardiovascular endurance data is normally distributed.

The results of the data hypothesis test using the formula to calculate the percentage of the mean or percentage of the respondent's answer choice, from each statement in one indicator of the variable of the Muscle and Cardiovascular Endurance

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Level Survey of Patalassang Football Association Players (PERSEPAT FC) using the following calculation steps:

Table 3.
Results of the variable percentage test of the Patalassang Football Association Players Muscle Endurance Level Survey (PERSEPAT FC)

Value	Sample	Percentage	Criterion
20-28	2	20%	Good
12-19	8	80%	Enough
Number of samples	10	100%	-

Based on the table above, it can be explained that the survey data on the level of endurance of the Patalassang Football Association Players (PERSEPAT FC) has a percentage, which has been explained in table 4.3 above, namely 2 people who are included in the good criteria with a percentage of 20%, and 8 people who are included in the sufficient criteria with a percentage of 80%, the overall sample is 10.

Table 4.
Results of the variable percentage test of the Cardiovascular Level Survey of Patalassang Football Association Players (PERSEPAT FC)

Value	Sample	Percentage	Criterion
KR. DR.-1.61	2	20%	Very Less
1,62-2,00	8	80%	Less
Number of samples	**10**	**100%**	**-**

Based on the table above, it can be explained that the data of the Muscle and Cardiovascular Endurance Level Survey of Patalassang Football Association Players (PERSEPAT FC) has a percentage, which has been explained in table 4.4 above, namely 2 people who are included in the very poor criteria with a percentage of 20%, and 8 people who are included in the fewer criteria with a percentage of 80%, the overall sample is 10.

Discussion

The results of the data analysis tested at SPSS 21 with the title "Survey of Muscle and Cardiovascular Endurance Levels of Patalassang Football Association Players (PERSEPAT FC)", From the results of data processing, it can be known that the level of the Survey of Muscle and Cardiovascular Endurance Levels of Patalassang Football Association Players (PERSEPAT FC). From the test data carried out in the SPSS application, the accumulated percentage with the variable muscle endurance of the Patalassang Football Association Players (PERSEPAT FC) has a percentage, which has been described in Table 4 above, namely 2 people who are included in the good criteria with a percentage of 20%, and 8 people who are included in the sufficient criteria with a percentage of 80%, and the level of muscular and cardiovascular endurance of Patalassang Football Association (PERSEPAT FC) players has a percentage, which has been explained in table 4.4 above, namely 2 people who are included in the very poor criteria with a percentage of 20%, and 8 people who are included in the less criteria with a percentage of 80%, the overall sample is 10.

For the individual ability of every badminton player to have good endurance, muscle endurance itself is a combination of strength and endurance. Physical endurance results

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in physiological and biochemical changes in muscles, so endurance, in general, manifests through muscle endurance. Endurance is divided into 2 namely cardiovascular endurance and muscle endurance. Cardiovascular endurance is a person's ability to use the heart, lungs and circulatory system effectively and efficiently to carry out continuous work that involves high-intensity muscle contractions for a long time (APRILIANTO, n.d.).

Muscle endurance is a person's ability to use the heart, lungs and circulatory system effectively and efficiently to carry out continuous work that involves high-intensity muscle contractions for a long time. Muscle endurance is the ability of muscles to perform repetitive or contracted work at the same time. Durability gradually decreases with age. The decline in muscle endurance does not occur as quickly as the decline in muscle strength (Maulana, 2019).

Endurance will increase the strength gained from defensive exercises. Physical activity that is for strength can help the body's muscles work to withstand the weight received, keep bones strong, maintain body shape and help improve prevention against disease. Muscle endurance is not only known in terms of strength but also the ability of muscles to contract over some time without experiencing fatigue (Mubarok & Kharisma, 2021).

Regular aerobic endurance training triggers metabolic changes in oxidative fibres, which are fibres that are primarily recruited during aerobic exercise. For example, the number of mitochondria and the number of capillaries that carry the blood of these fibres increased. Muscles that have adapted can use 02 efficiently and therefore more persistently perform prolonged activities without fatigue (Hardjanti, 2011). Endurance training can result in an increase in the number of capillaries per muscle fibre, but it seems to have little or no effect on the development of muscle size, where usually heavy resistance training will cause an increase in the size of muscle fibres and their strength, but there is no increase in oxidative in the muscles.

Repeated exercises that are carried out, will provide good endurance, cardiovascular endurance. Cardiovascular endurance is also often called aerobic endurance. Aerobic endurance is the ability to consume the highest oxygen during maximum work expressed in litres/minute or ml/kg/minute (Deliceo\uglu et al., 2024) that in various sports training books, aerobic fitness is termed by the name of maximum aerobic capacity (VO2Max). Meanwhile, (Santisteban et al., 2022) define aerobic fitness as the capacity to inhale, deliver and use oxygen, which is measured through a laboratory test called VO2Max. From the various definitions above, it can be concluded that cardiovascular endurance (aerobic endurance) is the ability of the heart and lungs to supply oxygen to the whole body for a long time and cardiovascular endurance is the main component of physical fitness.

CONCLUSION

The results of the analysis showed that the level of muscle endurance of PERSEPAT FC players based on Table 4. 3 had the following distribution: 2 people (20%) were in a

good category, and 8 people (80%) were in the fair category. Meanwhile, the results of the analysis of cardiovascular endurance levels based on Table 4.4 show that 2 people (20%) are in the very poor category, and 8 people (80%) are in the poor category. These findings indicate that the majority of players have a sufficient level of muscle endurance, but cardiovascular endurance is still relatively low. Therefore, a more focused training program on improving cardiovascular endurance is needed to improve players' physical performance.

ACKNOWLEDGMENT

With gratitude and respect, I would like to express my deepest gratitude to the Head Coach of the Patalassang Football Association (PERSEPAT FC) for the support and permission given in the implementation of this research. The assistance and direction provided have been an important part of the smooth research process that I conducted. I would also like to express my highest appreciation to all PERSEPAT FC athletes who have participated with dedication. Your extraordinary participation and cooperation have been very helpful in obtaining the data needed for this research. Not to forget, thank you to all parties who have contributed in various forms, both directly and indirectly. The help and support from fellow researchers, coaching staff, and other parties who have provided advice and facilities are very meaningful for the success of this research. Hopefully, this cooperation and togetherness can continue to be established and bring benefits to the development of science and the world of sports, especially football.

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