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The Relationship Between Leg Length and Flexibility on Smash Ability in Sepaktakraw Game

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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

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ABSTRACT

This study aims to find out the relationship between leg length and flexibility on smash ability in sepaktakraw games. This research is a type of correlational descriptive research. The population of this study is all students of SMA Negeri 22 Makassar with a research sample of 100 male students who are randomly selected. The data analysis techniques used are simple and multiple correlation analysis techniques. Based on the results of data analysis, it is concluded that: There is a significant relationship between leg length and smash ability in the sepaktakraw game, (ro = 0.564 > rt = 0.195); There was a significant relationship between the flexibility to smash ability in sepaktakraw game, (ro = 0.588 > rt = 0.195); There was a significant relationship between leg length and flexibility on smash ability in the game of sepaktakraw (Ro = 0.588 > Rt = 0.195).

Keywords : Leg Length; Flexibility; Smash; Sepaktakraw

INTRODUCTION

The advancement of science and technology accelerates changes in people's lives in general and especially in the field of sports, so as a consequence there are competitions to improve achievements between clubs and between regions (Hakim et al., 2022). To improve sports achievements, starting from research that sports are dynamic, at any given time tend to advance and increase continuously following the pace of scientific and technological development (Hammado & Sahabuddin, 2019). However, how to improve sports achievement itself is a problem that needs to be answered (Sahabuddin, 2022). So far, there have been outstanding improvements in achievements in the field of sports, so it can be said that it has entered a new level in the development of sports (Sahabuddin, Sudirman, et al., 2022), with frequent debates and discussions or polemics in the sports media that are now better than sports in the past. Because sports are complex and complicated and involve many parties in their management, the role of sports is increasingly important. Almost all regions pay great attention to sports activities in their regions because sports not only play a role in improving the physical freshness of an area (Bismar & Sahabuddin, 2019), but sports also take part in bringing the fragrance of the region's name. Therefore, sports

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need to be improved and socialized as one of the ways to coach achievements that can at the same time improve physical and spiritual health for every member of society (Sahabuddin, Ayoebi, et al., 2022). All of this needs to be a special concern, where sports have been used as a benchmark for the height of a nation's culture (Gemaini et al., 2023). So the pattern of sports development in Indonesia has certain goals and objectives, namely the problem of improving achievements (Bahtiar, 2022).

Several sports that have been fostered and developed in Indonesia, especially in South Sulawesi, include the sport of sepaktakraw (Sahabuddin, 2020). The achievement of sepaktakraw sports achievements in South Sulawesi can be said to be still the best compared to other regions (Sahabuddin & Fadillah, 2022). This is evident from every championship held where South Sulawesi sepaktakraw athletes often win championships. The achievements achieved are certainly inseparable from the support of various parties, including coaches and coaches and most importantly the athletes themselves (Herman et al., 2022). The quality of the sepaktakraw game is highly dependent on mastering the basic technique (Artyhadewa, 2017). Players who master the basic techniques well will be able to display the game skillfully (Muslim et al., 2023). In the game of sepaktakraw consists of several basic techniques (Hasan, 2017), one of the basic techniques that play a very important and decisive role in the game of sepaktakraw is the smash technique (Jufrianis, 2017), some squads that have good basic smash techniques have a great chance of winning the match (Chen & Xiao, 2017).

Implementation of the smash movement pattern in the sepaktakraw game (wibowo, R.A., Rumini, Rustiana, 2017) (Arfan & Asmi, 2019) consists of several jumping, kicking and landing movements (Rahaji et al., 2017). These three movements must be carried out continuously and in a relatively short time (Munandar, 2017) the process of the movement requires support from several factors (Wiyaka, 2017), including physical ability factors, especially flexibility and also supporting factors in obtaining good smash results (Salahuddin, 2017) (Yunitaningrum, 2020) Among them are body structure factors, especially the length of the legs which are the object of this study.

The flexibility in question is the flexibility of the body, which is the body's ability to perform movements with a wide amplitude (Azwan, 2019) or in a large joint motion space (Rafsanjani & Andi Saparia, 2018). Where in the sepaktakraw smash movement is done by folding the body (Aljundy & Yudi, 2019), so that the flexibility of the body plays a very important role in doing the smash movement well (Murti et al., 2020).

The length of the leg referred to in this research is the leg which is the lower leg used in performing smash movements (Wardiman & Hermanzoni, 2019), so it is suspected that the longer a person's legs, the better the smash results made (Arrazi & Hakim, 2020). Because of the long legs, the more likely it is to be able to make sharp and steep smashes and the harder it is to block (Setiawan et al., 2022).

METHODS

The method used in this study is descriptive. The research variables to be studied in this study consist of independent variables, namely leg length and flexibility, while the bound variable is smash sepaktakraw. The research design or research design used in this study is correlational. The population in this study is all male students of SMA Negeri 22 Makassar. The sample taken or used in this study amounted to 80 people from male students of SMA Negeri 22 Makassar class IX with a proportional random sampling technique. The data

collected in this study includes leg length measurements, flexibility tests, and smash ability in the game of sepaktakraw.

RESULTS AND DISCUSSION

Result

Descriptive data

The descriptive analysis of the research data consisting of the measurement of leg length, flexibility test and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students can be seen in the summary of the results of the descriptive analysis listed in the table.

Table 1.
Results of descriptive analysis of data

Statistical Hypothesis	Leg length	Flexibility	Smash sepaktakraw
N	100	100	100
∑ X	9484	2053	1794
∑ X2	899894	43495	33160
μ	94,84	20,53	17,94
Sd	2,08758	3,68852	3,13926
Min	90	10	11
Max	99	30	26

Based on the summary of the results of the descriptive analysis of the data in Table 1 above, it can be described as follows:

a. For leg length measurement data, from 100 samples, a total value of 9484 was obtained. The square values are obtained in total as 899894, then the average obtained = 94.84 with the result of standard deviation = 2.08758. Of the leg lengths, the lowest is 90 and the highest is 99.
b. For flexibility data from 100 samples, a total value of 2053 was obtained. The quadratic values were obtained in total as 43495, then the average obtained = 20.53 with the result of standard deviation = 3.68852. From the minimum data of 10 and the maximum 30.
c. For the data on the ability to smash sepaktakraw from 100 samples, a total score of 1794 was obtained. The quadratic values were obtained in total as much as 33160, then the average obtained = 17.94 with the result of standard deviation = 3.13926. From a minimum value of 11 and a maximum of 26.

Requirements testing analysis

The results of the Chi-Quadratic (χ^2) test were carried out, the results were obtained as seen in the following summary table:

Table 2.
Data normality test results

It	Variable	χ^{20}	χ^{2t}	Information
1	Leg length	5,3529	11,070	Usual
2	Flexibility	5,2101	11,070	Usual
3	Smash sepaktakraw	4,6387	11,070	Usual

Based on the table, which is a summary of the results of the data normality test on each research variable, it can be described as follows:

a. In the normality test of leg length data, the observed chi-squared value (χ^2) = 5.3529 was smaller than the chi-squared value of table (χ^2) at a significant level of 95% = 11.070. Thus, the leg length data obtained is normally distributed.
b. In the normality test of the flexibility data, the observed chi-square value (χ^2) = 5.2101 was smaller than the chi-square value of table (χ^2) at a significant level of 95% = 11.070. Thus, the flexibility data obtained is normally distributed.
c. In the normality test of the sepaktakraw smash ability data, the observed chi-square value (χ^2) = 4.6387 was smaller than the chi-square value of table (χ^2) at a significant level of 95% = 11.070. Thus, the data on the sepaktakraw smash ability obtained is normally distributed.

Correlation analysis

The correlation analysis used was single correlation analysis (r) and double correlation (R) at a significant level of 95%. The results of the correlation analysis are fully listed in the following table:

Table 3.
Results of correlation analysis

Hypothesis	N	r0	rt	Information
- Correlation of leg length with sepaktakraw smash ability	100	0,564	0,195	Significant
- Correlation of flexibility with sepaktakraw smash ability	100	0,588	0,195	Significant
- Correlation of leg length and flexibility with sepaktakraw smash ability	100	0,588	0,195	Significant

Hypothesis testing

Hypothesis testing was carried out using correlation coefficient analysis (r) at a significant level of 95%. The hypotheses tested for truth in this study are as follows:

There is a relationship between the length of the legs and the ability to smash in the sepaktakraw game of SMA Negeri 22 Makassar students.

Based on the results of the test of the correlation analysis of leg length data with smash ability in sepaktakraw, the observation correlation value (r0) = 0.564 was greater than the correlation value of the table (rt) at a significant level of 95% = 0.195. means that Ho is rejected and H1 is accepted. Thus there is a significant relationship between leg length and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students.

There is a relationship between flexibility and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students.

Based on the results of the test analysis, the correlation of flexibility data with smash ability in the sepaktakraw game. It was obtained that the observation correlation value (r0) = 0.588 was greater than the table correlation value (rt) at a significant level of 95% = 0.195. means that Ho is rejected and H1 is accepted. Thus, there is a significant relationship between flexibility and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students.

There is a relationship between leg length and flexibility with smash ability in badminton in SMA Negeri 22 Makassar students.

Based on the results of the test analysis of the correlation between leg length and flexibility with smash ability in the sepaktakraw game. It was obtained that the observation correlation value (r0) = 0.588 was greater than the table correlation value (rt) at a significant level of 95% = 0.195. means that Ho is rejected and H1 is accepted. Thus, there is a significant relationship between leg length and flexibility and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students.

Discussion

The first hypothesis; There was a significant relationship between the length of the leg and the ability to smash in the sepaktakraw game of SMA Negeri 22 Makassar students. It is evident from the results of the analysis that the observation correlation value is greater than the correlation value of the table. This proves that in doing a smash in the game of sepaktakraw, the length of the leg is one of the supporting factors in the game of sepaktakraw, with the range and movement that a player has, of course, providing wider movement in addition to the ability to smash, of course, it must be supported by the reach of the legs. The length of the legs you have will be useful in directing the ball.

The second hypothesis; There was a significant relationship between flexibility and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students. It is evident from the results of the analysis that the observation correlation value is greater than the correlation value of the table. This proves that a sepaktakraw player must have flexibility. In doing a smash in the sepaktakraw game, the flexibility of the striker forward will be very helpful when smashing. Because the movements carried out require extensive joint movement. Of course, flexibility is aimed at moving joints that are more flexible to bring to maximum ability.

The third hypothesis; There was a significant relationship between leg length and flexibility and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students. It is evident from the results of the analysis that the observation correlation value is greater than the correlation value of the table. This proves that the ideal leg length and flexibility will affect the smash ability besides that it is a supporting factor in doing the basic smash technique in the game of sepaktakraw. The ideal leg length of a sepaktakraw player can affect the ability to make movements to reach the movement of the ball, both the ball that bounces and the opponent's place. Besides that, supported by the ability of muscles to be more flexible will make a movement more effective and efficient when doing smash movements in the game of sepaktakraw. With the length of the legs and flexibility, it will help athletes carry out more accurate and sharp smashes.

CONCLUSION

After discussing the relationship between leg length and flexibility to smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students, the following conclusions were drawn:

1. There was a significant relationship between leg length and smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students.
2. There was a significant relationship between flexibility and smashing ability in the sepaktakraw game of SMA Negeri 22 Makassar students.

3. There was a significant relationship between leg length and flexibility on smash ability in the sepaktakraw game of SMA Negeri 22 Makassar students.

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