Journal Physical Health Recreation (JPHR)
Volume 4 Nomor 2 Mei 2024
https://jurnal.stokbinaguna.ac.id/index.php/JP
e-ISSN : 2747- 013X

Analisis Komponen Fisik Terhadap Kemampuan Smash Bola Voli Mahasiswa FIKK UNM

Analysis Of Physical Components On The Smash Ability Of FIKK UNM Students' Volleyball

Achmad Karim[1]

{achmad.karim@unm.ac.id[1]}

Universitas Negeri Makassar, Jl. A. P. Pettarani, Tidung, Kec. Rappocini, Kota Makassar, Sulawesi Selatan 90222[1]

Abstract. This research aims to prove: 1) The relationship between hand eye coordination and volleyball smash ability, 2) The relationship between wrist flexibility and volleyball smash ability, 3) The relationship between leg muscle explosive power and volleyball smash ability 4) The relationship between hand eye coordination and flexibility. wrist and leg muscle explosive power on volleyball smash ability. The research method used is a quantitative research method and the type of research is correlational research involving 3 independent variables, namely hand eye coordination, wrist flexibility and leg muscle explosive power, while the dependent variable is volleyball smash ability. The population in this study were FIKK UNM students, with a sample of 30 people taken using simple random sampling. The data analysis technique used is the correlation coefficient. The results of the research conducted show that: 1) There is a significant relationship between hand eye coordination and volleyball smash ability with a value of r = 0.849 (p<α0.05). 2) There is a significant relationship between wrist flexibility and volleyball smash ability with a value of r = 0.830 (p<α0.05). 3) There is a significant relationship between leg muscle explosive power and volleyball smash ability with a value of r = 0.749 (p<α0.05). 4) There is a significant relationship between hand eye coordination, wrist flexibility and leg muscle explosive power together on volleyball smash ability of 89.70% with a value of R = 0.897 (p<α0.05).

Keywords: Hand Eye Coordination, Wrist Flexibility, Leg Muscle Explosive Power, Volleyball Game Smashes

1 Introduction

Education is basically something that is very important for every human individual. Education, if interpreted broadly, is an effort made by other people to shape a person's character, knowledge and attitudes through teaching, training and research. Education is a conscious effort to prepare a better life for students who are independent and cultured, namely having morals

and character based on science, technology and having commendable creativity and bringing beautiful peace so that they can get a better life (Nainggolan, 2021).

Physical education is an integral part of overall education in schools which uses physical skills, motor skills, knowledge, attitudes and character formation to achieve national education goals (Fitri, 2021). The game of volleyball is one of the materials that is often taught in physical education. The game of volleyball has become a game that is known by all levels of society, including children, adults, and even the elderly, so this sport has become very popular at world level (Purwanto, 2021)

Volleyball is a game played by two teams in an area bounded by a net and each team consists of 6 players who try to get the ball into the opponent's area by hitting the ball with their hands to score points. The game of volleyball can also be interpreted as a team game consisting of more than one person so that team success is determined by teamwork and sportsmanship (Maifa, 2021).

One of the determining factors for a team's victory or defeat is the quality of its attackers. The most common attacking technique used in volleyball is the smash technique. Smash or spike is a technique of attacking or hitting a ball in the air which is directed at the opponent's area hard and dives while jumping (Prasetyao, 2020). Smash or spike is the act of hitting the ball hard using a certain technique so that the ball can enter the opponent's court area in the hope that it cannot be returned or blocked so that it can score points. This technique is usually used when the ball is bouncing over the net from a pass over a teammate (Amin, 2020).

Attacks in volleyball are very important for producing points. Smash that dives and falls in an empty space, making the opportunity to gain points very large. High jumps can also support the game so that it can be maximized. A spiker is not only seen in terms of posture but also must have technique and other supporting physical factors. The reality is that most spikers are chosen only based on posture so that their smashes are less than optimal (Umar, 2020).

In this study, eye-hand coordination, wrist flexibility and leg muscle explosive power are the physical condition factors that will be studied. However, the level of a person's physical condition varies. Likewise, everyone's volleyball smash ability is different (Nugroho, 2021).

From the results of observations by researchers at the FIKK UNM campus, it can be seen that quite a high number of students are interested in volleyball. It can be seen from the large number of students who are enthusiastic about taking part in volleyball lessons. However, students' ability to master basic volleyball techniques is still very low, especially in basic smash techniques (listina, 2012). When some students smash, the ball does not dive down but instead flies out of the opponent's playing area (out). Apart from that, the ability to jump when smashing is still low so sometimes the smashed ball does not cross the net. Another problem is that some students are still unable to direct the smash into the opponent's empty area so that the smashed ball can be blocked or returned by the opponen (Mulyadi, 2020)t.

2 Method

To influence these variables so that variable manipulation does not occur. This study aims to determine the contribution of hand eye coordination, wrist flexibility and leg muscle explosive power to the smash ability of volleyball.

1. Research Place

This research was carried out at the FIKK UNM campus

2. Research Variables

The research variables used in this research include:

a.Free variable

1) hand eye coordination

2) wrist flexibility

3) leg muscle explosive power

b. Dependent variable:

1) smash ability of volleyball

According to Sugiyono (2013:80) "population is a generalized area consisting of objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions". So based on the definition above, the population used in this research is all FIKK UNM students.

A sample is a part of a population selected according to certain rules, and must describe the properties or characteristics of the entire population. Bidiwanto (2017; 160). A sample is a part of a population taken using certain techniques that are needed to determine the number of samples using random sampling techniques or at random. The number of samples in this research was 30 FIKK UNM students.

Data Analysis Techniques

After all the research data has been collected, the next step is analyzing the data. This allows researchers to draw conclusions about the data through analysis. Computer-assisted statistics using the SPSS version 21 program to find out whether there is a relationship between the independent variable and the dependent variable. Results of smash ability of volleyball and three independent variables: of hand eye coordination, wrist flexibility and leg muscle explosive power.

3 Result

Based on the results of research conducted on FIKK UNM students. The results of statistical analysis relating to the scores of hand eye coordination, wrist flexibility, leg muscle explosive power on the volleyball smash ability of FIKK UNM students are presented in the following table:

Table 1. Summary of results of descriptive analysis of data

Statistik	Hand Eye Coordination (X1)	Wrist Flexibility (X2)	Leg Muscle Explosive Power (X3)	Volleyball Smash Ability (Y)
N	30	30	30	30
Mean	9.47	85.00	41.73	37.60
Median	9.50	85.00	40.00	37.00

Std. Deviation	1.383	2.464	7.656	3.103
Variance	1.913	6.069	58.616	9.628
Range	5	10	31	15
Minimum	7	80	26	30
Maximum	12	90	57	45
Sum	284	2550	1252	1128

Data Normality Test

1. In testing the normality of hand eye coordination data, the values obtained were KS-Z = 0.150 and P = 0.083 which was greater than α = 0.05. Thus, the hand eye coordination data obtained is normally distributed.

2. In testing the normality of wrist flexibility data, the values obtained were KS-Z = 0.142 and P = 0.124 which was greater than α = 0.05. Thus, the wrist flexibility data obtained is normally distributed.

3. In testing the normality of leg muscle explosive power data, the values obtained were KS-Z = 0.123 and P = 0.200 which was greater than α = 0.05. Thus, the leg muscle explosive power data obtained is normally distributed.

4. In testing the normality of smash ability data, the values obtained were KS-Z = 0.157 and P = 0.058 which was greater than α = 0.05. Thus, the smash ability data obtained is normally distributed.

Correlation Analysis

After carrying out data normality tests on the hypothesis to be tested, the hypothesis is tested to prove its correctness.

Table 2. The first hypothesis, hand eye coordination on smash ability in volleyball

Correlation	N	r	P_{value}	Description
X_1. Y	30	0,849	0,000	Significant

Based on the results of correlation analysis of hand eye coordination data on smash ability in volleyball games, a correlation value (r) = 0.849 was obtained, with a probability level (P) = 0.000 smaller than α = 0.05. so HO is rejected and H1 is accepted (significant correlation coefficient), or hand eye coordination has a significant relationship to smash ability in volleyball. Thus, it can be concluded that there is a relationship between hand eye coordination and smash ability in volleyball

Table 3. The second hypothesis, wrist flexibility on smash ability in volleyball

Correlation	N	r	P_{value}	Description
X_2. Y	30	0,830	0,000	Significant

Based on the results of correlation analysis of wrist flexibility data (X2) on smash ability in volleyball games, a correlation value (r) = 0.830 was obtained, with a probability level (P) = 0.000 smaller than α = 0.05. So HO is rejected and H1 is accepted (significant correlation coefficient), or wrist flexibility has a significant relationship to smash ability in volleyball. Thus, it can be concluded that there is a significant relationship between wrist flexibility and smash ability in volleyball.

Table 4. The third hypothesis is that there is a relationship between leg muscle explosive power and smash ability in volleyball

Correlation	N	r	P_{value}	Description
X_3. Y	30	0,749	0,000	Significant

Based on the results of the correlation analysis of leg muscle explosive power data (X3) on smash ability in volleyball games, a correlation value (r) = 0.749 was obtained, with a probability level (P) = 0.000 which is smaller than α = 0.05. So HO is rejected and H1 is accepted (significant correlation coefficient), or leg muscle explosive power has a significant relationship to smash ability in volleyball. Thus, it can be concluded that there is a significant relationship between leg muscle explosive power and smash ability in volleyball.

Table 5. The fourth hypothesis is that there is a relationship between hand eye coordination, wrist flexibility and leg muscle explosive power on the ability to smash in volleyball.

Correlation	N	R	R^2	P_{value}	Description
X_1.X_2. X_3. Y	30	0,897	0,805	0,000	Significant

Based on the results of the correlation analysis of data on hand eye coordination, wrist flexibility and leg muscle explosive power on the volleyball smash ability of FIKK UNM students, a correlation value was obtained (r) = 0.897, with a probability level (P) = 0.000 which is smaller than α = 0, 05. So HO is rejected and H1 is accepted (significant correlation coefficient), or the relationship between hand eye coordination, wrist flexibility and leg muscle explosive power has a very significant effect on the volleyball smash ability of FIKK UNM students. Thus, it can be concluded that there is a significant relationship between hand eye coordination, wrist flexibility and leg muscle explosive power on the volleyball smash ability of FIKK UNM students.

4 Discussion

1. The relationship between hand eye coordination and smash ability in volleyball

From the results of testing the first hypothesis, it shows that there is a significant relationship between hand eye coordination and the smash ability of FIKK UNM students in volleyball with a correlation coefficient (r) of 0.849. Hand eye coordination has a very close relationship to the ability to smash in volleyball. This is because to do a good volleyball smash,

you need to determine where the ball will be directed, accompanied by synchronized hand movements to direct the ball to the predetermined position.

In the game of volleyball, a smash is an attempt made to attack the opponent's area by jumping and hitting the ball as hard as possible to score points. To smash, it is not enough just to have the strength to hit the ball as hard as possible, but you also have to have other physical components. When smashing, of course the opponent will try to block the attack by blocking the attack. For this reason, players must be able to see empty space to direct the ball into that empty space to get points. In this case, a combination of vision and hand movements is needed to be able to direct the ball to a target area that the opponent cannot reach (karim, 2023).

From the explanation above, it can be concluded that eye-hand coordination has a very big role in the ability to smash volleyball to direct the ball towards a predetermined target. The better a person's hand eye coordination ability, the better his smash ability will be.

2. The relationship between wrist flexibility and smash ability in volleyball

Testing the second hypothesis shows that there is a significant relationship between wrist flexibility and the smash ability of FIKK UNM students with a correlation coefficient (r) of 0.830.

Smash is one of the most effective ways to earn points. A good smash is a smash that is directed and dives into the opponent's area without touching the opposing player. To produce a smash that dives sharply into the opponent's area and can also direct the ball, good wrist flexibility is required.

Smashing in volleyball is a movement that really requires wrist flexibility. When smashing in volleyball, accuracy and strength are needed so that the ball can enter and dive sharply into the opponent's area. Apart from that, flexibility of the wrist is also very necessary so that the ball can dive into the opponent's area so that the ball does not leave the field of play. The better the flexibility of a person's wrist, the better the results of the smash.

So based on this explanation, it can be concluded that to produce a good smash, good wrist flexibility is also needed.

3. The relationship between leg muscle explosive power and smash ability in volleyball

Testing the third hypothesis shows that leg explosive power has a significant relationship to the smash ability of FIKK UNM students in volleyball. This is proven by the correlation coefficient (r) value of 0.749.

To smash a volleyball game, a player will jump before hitting the ball. Maximum jumps will produce maximum ball hits. When jumping, the explosive power of the legs will work. So the better the explosive power of a person's legs, the better the person's jumping ability will be to produce maximum blows (Tawakal, 2020).

Based on this explanation, to be able to improve the smashing ability in volleyball, it is necessary to increase the explosive power of the legs. Good tactical and technical abilities in smashing will not be optimal without other supporting factors, especially the explosive power of the legs to achieve maximum jumps (Kadafi, 2021).

4. The relationship between hand eye coordination, wrist flexibility and leg muscle explosive power on smash ability in volleyball

From testing the fourth hypothesis, it shows that there is a significant relationship between hand-eye coordination, wrist flexibility and leg explosive power on the smash ability of FIKK UNM students in volleyball.

Based on the calculation results, the value of the recretion coefficient (R) is 0.897. With a determinant coefficient value of 0.805, it can be said that hand-eye coordination, wrist flexibility and leg explosive power have an 80.5% influence on FIKK UNM students' volleyball smash ability.

Smash is an attempt to attack the opponent's area by hitting the ball as hard as possible into the opponent's area to score points. Performing a smash requires supporting physical components. Jumping, hitting and aiming at the target are very necessary to produce a deadly smash (Ismoko, 2013).

When hitting the ball, hand eye coordination is needed to combine the movement of hitting the ball with seeing the target to be aimed at. Good hand eye coordination will result in a better movement of hitting the ball towards the target. Flexibility of the wrist is needed to make the ball hit dive down and not fly out of the opponent's playing area. Good wrist flexibility will make the shot dive more into the opponent's playing area. Meanwhile, jumping movements require explosive leg power to make higher jumps. A high jump will make the smash success rate higher (Isabella, 2021).

Based on the explanation above, it can be concluded that with good hand-eye coordination, wrist flexibility and arm explosive power, you will also produce maximum smashes.

5 Conclusion

Based on the results of data analysis and discussion, the research conclusions are stated as follows:

1. There is a significant relationship between hand eye coordination and the smash ability of FIKK UNM students in volleyball.

2. There is a significant relationship between wrist flexibility and the smash ability of FIKK UNM students in volleyball.

3. There is a significant relationship between leg explosive power and the smash ability of FIKK UNM students in volleyball.

4. There is a significant relationship between hand eye coordination, wrist flexibility and leg explosive power on the smash ability of FIKK UNM students in volleyball..

References

Amin, H., & Adnan, A. (2020). studi tentang beberapa komponen kondisi fisik atlet bolavoli smk negeri 1 kota solok. Jurnal Patriot, 2(1), 266-277.

Fitri, R. A., & Siregar, Y. I. (2021). PENGARUH VARIASI LATIHAN PASSING BAWAH DENGAN MODEL HURUF TERHADAP HASIL PASSING BAWAH BOLA VOLI PUTRI KLUB TVRI MEDAN TAHUN 2021. Journal Physical Health Recreation (JPHR), 2(1), 1-9.

Isabella, A. P., & Bakti, A. P. (2021). Hubungan Daya Ledak Otot Tungkai Dan Kekuatan Otot Lengan Terhadap Accuracy Smash Bolavoli. Jurnal Kesehatan Olahraga, 9(03).

Ismoko, A. P., & Sukoco, P. (2013). Pengaruh metode latihan dan koordinasi terhadap power tungkai atlet bola voli junior putri. Jurnal Keolahragaan, 1(1), 1-12.\

Kadafi, A. P., & Irsyada, M. (2021). Analisis Kondisi Fisik Atlet Bola Voli Putra Blitar Mandiri Di Masa Pandemi Covid-19. Jurnal Prestasi Olahraga, 4(6), 128-133.

Karim, A., & Hasbillah, M. (2023). Analisis Komponen Fisik Terhadap Kemampuan Passing Bawah Permainan Bola Voli Siswa SMAN 8 Makassar. Jurnal Dunia Pendidikan, 4(1), 347-355.

Listina, R. (2012). Mengenal Olahraga Bola Voli. PT Balai Pustaka (Persero).

Maifa, S., & Barantai, S. P. (2021). Analisis Komponen Fisik Terhadap Kemampuan Smash Bola Voli. Jurnal Porkes, 4(1), 62-68.

Mulyadi, D. Y. N., & Pratiwi, E. (2020). Buku pembelajaran bola voli.

Nainggolan, F. A. A., & Sinulingga, A. (2021). Pengaruh Variasi Latihan Metode Drill Terhadap Jump Serve Pada Atlet Putra Klub Bola Voli Nusantara Deli Serdang Tahun 2021. Journal Physical Health Recreation (JPHR), 2(1), 45-52.

Nugroho, R. A., Yuliandra, R., Gumantan, A., & Mahfud, I. (2021). Pengaruh Latihan Leg Press dan Squat Thrust Terhadap Peningkatan Power Tungkai Atlet Bola Voli. Jendela Olahraga, 6(2), 40-49.

Prasetyo, W. E. (2020). Studi Kondisi Fisik Bolavoli. Jurnal Patriot, 2(2), 590-603.

Purwanto, K. (2021). Peningkatan Kemampuan Keterampilan Salah Satu Permainan Bola Besar (Bola Voli) Siswa Kelas XI IPS 1 SMA NEGERI 1 Dawarblandong Mojokerto Dengan Menggunakan Metode Simulasi Tahun Pelajaran 2019/2020. TEACHING: Jurnal Inovasi Keguruan dan Ilmu Pendidikan, 1(3), 157-168.

Tawakal, I. (2020). Buku Jago Bola Voli. Ilmu Cemerlang Group.

Umar, W. E. P. (2020). Studi Kondisi Fisik Bolavoli. Jurnal Patriot, 2(2), 102.