The Influence of Body Structure and Eye-Hand Coordination on Upper Passing Ability in Volleyball Games

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ABSTRACT

The cause is not optimal due to non-bio motor factors, namely inadequate body structure, and bio motor factors, namely poor hand-eye coordination. This study aims to determine whether or not there is an effect of body structure on the ability of pass over, to determine whether there is an effect of eye coordination on the ability to passing-over and to determine whether there is an influence of body and eye-hand coordination on the ability to pass over. This type of research is descriptive correlational by involving the independent variables (independent) consisting of body structure and eye-hand coordination, while the controlling variable is the ability to pass. The research sample was students of SMP Negeri 27 Makassar with a total of 30 people drawn by random sampling. The research instrument used an upper passing test, measurement of body structure by measuring height, weight and arm length, and eye-hand coordination with a chess pass test. The results showed that there was a significant effect on the body's upper passing ability (p<0.05), there was a significant structural effect of eye-hand coordination on the upper-passing ability, and there was a jointly significant effect of body structure and eye coordination on upper passing ability (p<0.05).

Keywords: Body Structure; Eye-Hand Coordination; Upper Passing Ability.

INTRODUCTION

Physical education has a role in developing the quality of Indonesian people, both knowledge, skills, fitness, aesthetics, social, self-confidence and participating in various physical activities. To develop these qualities can be through sports games. Because sport as a medium in physical education. Currently, sport has become a basic need and has become a business field. Therefore, in various public arenas, sports infrastructure is available, including in schools and campuses. In fact, at various levels of education in Indonesia, sports which contain various sports material contained in physical education subjects are included in the curriculum. In the Education Unit Level Curriculum (KTSP)

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and the 2013 Curriculum, volleyball games are included in one of the sports games and big ball teams. With the inclusion of volleyball games into the educational curriculum, students will receive skills and learn volleyball skills. This can be used for superior talent scouting for students who excel.

In the volleyball game there are several basic techniques, namely service, passing, smash and blocking. Basic technique is the most important thing in volleyball, because it will determine how to do a good basic movement and determine success in the game. Passing over is one of the basic techniques that need to be mastered by students. because good passing acceptance is the beginning of the success of the smash. According to Robinson, passing is the most important basic technique in volleyball. By mastering passing means the game can go well, because passing is one technique to receive the ball thrown by opposing players (Syahruddin and Suyuti 2016).

For students at SMP Negeri 27 Makassar, learning to play volleyball is not a new thing, since elementary school (SD) learning to play volleyball has been taught, although it is not uncommon to find students who still have difficulty in passing over and some of them don't even know. Basic techniques of the game of volleyball. This shows that there are problems in volleyball learning so that researchers try to find out the causes of success and failure in passing over. Likewise, the identification of research conducted by Sahabuddin et al. shows that the presentation of material used by teachers generally does not use the student center learning (SCL) approach (Sahabuddin, Hakim, and Syahruddin 2020).

Based on observations on students of SMP Negeri 27 Makassar when learning volleyball, students are less in passing over. This observation is also reinforced by the results of interviews with physical education teachers that students are minimal in biomotor aspects, especially in eye-hand coordination. In fact, the biomotor ability is predicted to play a role in upper passing, namely hand-eye coordination. Because eye-hand coordination is closely related to accuracy and anticipation of the ball, both in defending, attacking and in providing feedback to teammates. Sukirno and Andriyanto identified that students lack eye-hand coordination so that when they do passing over students cannot be maximized, the movements made look stiff, not flexible and the result is that the ball from the top pass is not directed properly (Sukirno and Andriyanto 2019).

Not only that, passing over is part of the activity of passing the ball to one's own friends in a team with a certain technique, as a first step to developing an attack pattern

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on the opposing team, passing skills in volleyball games can be achieved if the game can combine various biomotor abilities but also non-biomotor aspects. possessed by students is very decisive, lies in the structure of the body. To achieve physical education learning outcomes, students need to be supported by biomotor and non-biomotor factors (Shahruddin, Saleh, and Saleh 2019).

The ideal body structure is what is needed for students to carry out the upper passing movement well. For a student who wants to develop his ability to play volleyball, especially in doing overhead passes, having an ideal body structure is predicted to be faster in mastering basic techniques in volleyball. Body structures that have an effect on improving overhead passing techniques such as height, weight, and arm length. Height, for someone who has a tall body with a great body compatibility and an ideal body weight is one of the good potentials to be developed in volleyball, especially in doing overhead passes.

By looking at the characteristics of the volleyball game, where height is very helpful for a player in carrying out basic movements in the volleyball game. Apart from height, other body structures are also involved and have a very important role, especially in doing overhead passes, such as body weight and arm length. So based on the explanation above, of course, if a student has a good body structure with a harmonious body size and ideal body weight, of course, it is hoped that the student will also be able to pass over well. Mastery of basic volleyball techniques and the ability to apply tactics, attack, and defense is determined by the quality of the physical condition of each player supported by body posture (Hananingsih 2020).

METHOD

The approach used in this research is a quantitative approach with the type of correlational research (Gumanti, Yudiar, and Syahruddin 2016). The variables used in this study are independent variables, namely body structure (ST) and hand eye coordination (KMT) while the dependent variable is upper passing ability (KPA). The research population was 266 students of SMP Negeri 27 Makassar with a sample of 30 people who were taken by random sampling. The data collection technique used an upper passing test instrument, measurements of body structure between height, weight and arm length, as well as a chess pass test. The research data were analyzed using inferential statistical analysis with association test at a significance level of 95%.

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RESULTS AND DISCUSSION

Table 1.
Results of Descriptive Analysis of Body Structure Data, Hand Eye Coordination and Upper Passing Ability

	ST	KMT	KPA
N	30	30	30
Mean	152	26.8	15.73
Std Deviasi	12.9	3.274	3.016
Variance	166.414	10.717	9.099
Minimum	131	19	11
Maksimum	171	33	21
Sumlah	4560	804	472

Based on Table 1. body structure data (X1) on students of SMP Negeri 27 Makassar, obtained a maximum score of 171, a minimum value of 131, an average value of 152, a standard deviation (s) of 12.9 and a variance of 166,414. eye-hand coordination data (X2) obtained a maximum value of 33, a minimum value of 19, , an average value of 26.8, a standard deviation (s) of 3,274 and a variance of 10,717. Overpassing ability data (Y) obtained a maximum value of 21, a minimum value of 11, an average value of 15.3, standard deviation (s) of 3.016 and a variance of 9.099.

Table 2.
Results of Normality Analysis of Body Structure Data, Hand Eye Coordination and Upper Passing Ability

	Shapiro wilk		
	Statistic	df	Sig
ST	0.938	30	0.078*
KMT	0.969	30	0.515*
KPA	0.964	30	0.131*

Based on table 2. the results of testing the normality of the data using the Shapiro Wilk test, it is known that the body structure variables (X1), hand eye coordination (X2), and upper passing ability (Y) in the table above indicate that the data are in a normal distribution (p> 0 ,05).

Table 3.
ST Hypothesis Test to PA

Model		Unstandardized Coefficients		Standardized Coefficients	t	sig
		B	SE	Beta		
1	(constant)	-14.188	3.638		-3.900	0.001
	ST	0.197	0.024	0.842	8.254	0.000

From Table 3, it can be seen from the results of the regression analysis that the coefficient for the ST variable is (0.197) with a constant of (-14.188), so that the regression equation model obtained is as follows: Y1 = -14.188+0.197X1. The results of

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the empirical test of the effect of ST on PA showed the value of t count = 8.254 (p < 0.05). This means that there is an effect of ST with PA.

Table 4.
Results of Regression Analysis and Body Structure ANOVA Against Upper Passing

R	R²	F	Sig
0.842	0.709	68.128	0,000

Based on Table 4, it is known that the R square coefficient model is 0.842, the magnitude of the coefficient of determination is 0.709%. This figure means that the effect of ST on PA is 70.9% while the remaining 29.1% is determined by other factors. Furthermore, it was found that F count = 68.128 (p<0.000), so it can be concluded that there is a significant effect of ST on PA.

Table 5.
Results of Analysis of the Effect of KMT on Upper Passing

Model		Unstandardized Coefficients		Standardized Coefficients	t	sig
		B	SE	Beta		
1	(constant)	-4.565	2.677		-1.705	0.099
	ST	0.757	0.099	0.822	7.638	0.000

From Table 5, it can be seen from the results of the regression analysis that the coefficient for the KMT variable is (0.757) with a constant of (-4.565), so that the regression equation model obtained is as follows: $Y_1 = -4.565 + 0.757 X_2$. The results of the empirical test of the effect of KMT on PA showed the value of t count = 7.638 (p < 0.05). This means that there is an effect of KMT on PA.

Table 6.
Results of Regression Analysis and KMT Anova Against Upper Passing

R	R²	F	Sig
0.822	0.676	58.337	0,000

Based on Table 6, it is known that the R square coefficient model is 0.676, the magnitude of the coefficient of determination is 0.676%. This figure means that the effect of KMT on PA is 67.6% while the remaining 32.4% is determined by other factors. Furthermore, it was found that the calculated F value = 58.337 (p <0.000), so it can be concluded that there is a significant effect of KMT on PA.

Table 7.
Results of Analysis of the Effect of ST and KMT on Upper Passing

Model		Unstandardized Coefficients		Standardized Coefficients	T	sig
		B	SE	Beta		
1	(constant)	-12.307	3.467		-3.550	0.001
	ST	0.120	0.039	0.513	3.040	0.005
	KMT	0.366	0.155	0.397	2.356	0.026

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From Table 7, it can be seen from the results of the regression analysis that the coefficients for the variables ST = 0.120 and KMT = 0.366 with a constant of -12.307, so the regression equation model obtained is as follows: $Y1 = -12.307 + 0.12X1 + 0.366X2$. The results of the empirical test of the effect of ST on PA showed a value of t = 3,040 (p < 0.05) and KMT on PA showed a value of t = 2,356 (p < 0.05). This means that there is a joint influence of ST and KMT on PA.

Table 8.
Results of Regression Analysis and KMT Anova Against Upper Passing

R	R^2	F	Sig
0.871	0.758	42.376	0,000

Based on Table 8, it is known that the R square coefficient model is 0.758, the magnitude of the coefficient of determination is 0.758%. This figure means that the effect of ST and KMT on PA is 75.8% while the remaining 24.2 is determined by other factors. Furthermore, it was found that the calculated F value = 42,376 (p < 0.000), so it can be concluded that there is a significant effect of ST and KMT on PA.

Discussion

There is an influence of body structure on upper passing

Body structure affects the passing over. This is indicated by the body structure, namely height, weight and arm length of a person who plays a role in passing. This means that to be able to do the upper pass properly, it must be supported by a good body structure and adequate, in addition to the process of physical activity and regular exercise.

Physical activity that is done regularly and programmed will make a person's body structure also look ideal. Body structure in relation to upper passing is very influential, including in the sport of volleyball. Regarding the height factor, for someone who has a tall body with a great body compatibility and an ideal body weight is one of the good potentials to be developed in volleyball, especially in passing. Having an adequate height will certainly provide a long reach in anticipating the arrival of the ball. Likewise with the arm. Because of that someone has long arms that are very supportive in passing over. The results of Syahruddin's research show that students who have maturity in the nervous and muscular systems will find it easier to control their motor movements and in the end it will also have an impact on complete growth and development. In addition to the nervous system and muscles, with increasing age allows height, weight and body type will increase. For students who have high body size and

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ideal body weight will tend to be easier to move than obese or in other words that students who have normal motor development will be better at doing physical activities or sports than students who are less normal (Shahruddin 2021).

Body structure is something that greatly affects appearance in sports (Salahuddin 2018). Body structure in volleyball is one of the determining factors in achieving achievement because in volleyball, in addition to speed and good coordination, posture also needs to be considered. Adequate posture, combined with strength and speed, can help volleyball players achieve perfect movements. A volleyball player with adequate anatomy and body structure will be able to grab the ball well and give it to his teammates.

There is an effect of eye-hand coordination on the ability to pass over

Coordination is needed for all activities that require accuracy to a target (Dahlan, Hidayat, and Syahruddin 2020). Eye-hand coordination plays a very big role in every movement activity in sports, especially those involving hand function and observing an object. The two members of the body, namely the eyes and hands, when carrying out their functions for a task together with others will work in an integrated manner.

Many movements in sports require hand-eye coordination. One of them is the upper passing movement in the volleyball game, a student with good eye and hand coordination is not only able to do the upper pass perfectly, but also can easily and quickly perform a new skill for him. He can also change and move quickly from one movement pattern to another, so that his movements become efficient and if a player does not have good eye-hand coordination, it can be fatal when passing over in a volleyball game. Thus eye-hand coordination has a significant relationship with the ability to pass over in volleyball. This study is in line with the results of research conducted by Prasetya and Tjung Hauw Sin that there is a relationship between eye-hand coordination on over-passing ability with a Correlation Coefficient of 0.582. This means that the eye-hand coordination variable is related to the passing ability of volleyball. Therefore, the element of hand-eye coordination must be given to class X students of SMA Adabiah Padang (Imam Prasetia 2019).

There is an influence of body structure and eye-hand coordination on the ability to pass over

Body structure and eye-hand coordination are very influential in sports because each person's movement ability and body structure can support the sport, especially when passing upper.

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Body structure in volleyball is one of the determining factors in achievement because if the body structure is supported by good coordination and combined with strength and speed, it will be able to help volleyball players achieve perfect movements. (Nasriani and Mardel suggested that hand-eye coordination is a complex psychomotor skill with an important role in adaptation, involving the synergistic action of sensory functions (exteroceptive and interoceptive) and motor functions, which generate information parameters and movement energy (Nasriani and Mardela 2019). well-developed coordination positively affects motor control abilities in unusual situations. In volleyball, it is very important to systematically improve this complex and special ability. Perdima's research results suggest that there is a significant relationship between eye-hand coordination and over-passing skills Eye-hand coordination is very much needed by students in directing an object towards the target to be achieved, so that with good eye-hand coordination, the percentage of success in passing over so that it precisely leads to the target will be higher. good initiation, then an object that is thrown will succeed towards the target well (Perdima 2018).

Volleyball games are mostly determined also by reaction speed (especially complex motor reactions with choices), then the kinesthetic differentiation abilities of the legs (the ability to estimate the power of explosions) and the kinesthetic differentiation abilities of the arms (the ability to estimate the power of hitting the ball, after passing or jumping). Thus, it can be stated that body structure is also influenced by eye-hand coordination, and has a good influence on over-passing abilities in volleyball games. Ilham Kamaruddin's research concluded that there was a significant effect of body structure on the accuracy of attacks in the floret fencing martial arts of South Sulawesi fencers. This means that players who have high posture have a very large opportunity to insert their punches into the opponent's target area, because players with high posture have a long reach. Therefore, fencers should be selected taking into account their posture. Players with long arms who will find it easier to direct weapons to the opponent's target area, especially if they are supported by good physical components (Kamaruddin 2019).

The body structure consisting of height, weight and arm length owned by an individual can make a positive contribution to skills in various sports, including volleyball, especially upper passing so that it will make it easier for students to direct the ball both to the team and towards an empty (hard to reach) opponent's field.

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CONCLUSIONS AND SUGGESTIONS

Based on data analysis and discussion, it can be concluded as follows that there is an effect of body structure on upper passing ability ($p<0.05$), there is an effect of eye-hand coordination on upper-passing ability ($p<0.05$), and there is an influence of body structure and eye-hand coordination on passing ability. top in volleyball ($p<0.05$).

REFERENCES

Dahlan, Firmansyah, Rahmad Hidayat, and Syahruddin Syahruddin. 2020. "Pengaruh Komponen Fisik Dan Motivasi Latihan Terhadap Keterampilan Bermain Sepakbola." *Jurnal Keolahragaan* 8(2). doi: 10.21831/jk.v8i2.32833.

Gumanti, Ary, . Yudiar, and . Syahruddin. 2016. *Metode Penelitian Pendidikan*.

Hananingsih, Wahyu. 2020. "Hubungan Tinggi Badan Terhadap Hasil Ketepatan Smash Dalam Permainan Bolavoli." *JPIn: Jurnal Pendidik Indonesia* 1(2). doi: 10.47165/jpin.v1i2.24.

Imam Prasetia, Tjung Hauw Sin. 2019. "Hubungan Emosional Dan Koordinasi Mata-Tangan Terhadap Kemampuan Passing Atas Bolavoli." *Patriot*.

Kamaruddin, Ilham. 2019. "Pengaruh Kemampuan Fisik Dan Struktur Tubuh Terhadap Ketepatan Serangan Beladiri Anggar Senjata Floret." *SPORTIVE: Journal Of Physical Education, Sport and Recreation* 3(1). doi: 10.26858/sportive.v3i1.16860.

Nasriani, Anum, and Romi Mardela. 2019. "Kecepatan Reaksi Dan Koordinasi Mata-Tangan Berhubungan Dengan Kemampuan Smash Bolavoli." *Jurnal Patriot, Universitas Negeri Padang2* 1(3).

Perdima, Feby Elra. 2018. "Hubungan Koordinas Mata Tangan Terhadap Keterampilan Passing Atas Siswa Smp Negeri 1 Lebong Utara Kabupaten Lebong." *Journal Physical Education, Health and Recreation* 2(2). doi: 10.24114/pjkr.v2i2.9592.

Sahabuddin, Sahabuddin, Hikmad Hakim, and Syahruddin Syahruddin. 2020. "Meningkatkan Keterampilan Proses Passing Bawah Bolavoli Melalui Pembelajaran Kooperatif." *Jurnal Penjaskesrek* 7(2).

SALAHUDDIN, MUHAMMAD. 2018. "Analisis Struktur Tubuh Terhadap Keterampilan Bermain Sepaktakraw Pada Atlit Sepaktakraw Kabupaten Banggai." *JURNAL PENDIDIKAN GLASSER* 1(1). doi: 10.32529/glasser.v1i1.3.

Sukirno, Sukirno, and Arlin Andriyanto. 2019. "Hubungan Koordinasi Mata - Tangan Dengan Hasil Passing Atas Pada Permainan Bola Voli Putra SMA NEGERI 15." *Altius : Jurnal Ilmu Olahraga Dan Kesehatan* 6(1). doi: 10.36706/altius.v6i1.8228.

Syahruddin, S., and A. Suyuti. 2016. "Pengaruh Gaya Mengajar Latihan Dan Gaya Mengajar Komando Terhadap Keterampilan Passing Atas Bola Voli." *Jurnal Pedagogik Olahraga*.

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Syahruddin, Syahruddin. 2021. "Profil Tingkat Gerak Dasar Siswa Sekolah Dasar Kota Makassar." *Jendela Olahraga* 6(1). doi: 10.26877/jo.v6i1.7270.

Syahruddin, Syahruddin, Muhammad Syahrul Saleh, and M. Sahib Saleh. 2019. "Pengaruh Kinestetik, Sikap, Dan Motivasi Terhadap Hasil Belajar Pendidikan Jasmani." *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran* 5(2):232.