



Effectiveness of Arm Strength, Leg Strength, and Body Flexibility on Students' Volleyball Underhand Passing Ability

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ABSTRACT

This researcher aims to determine the effect of arm strength, leg strength and body flexibility on underhand passing ability in volleyball. The population in this study were students of SMA Negeri 9 Makassar. A sample of 30 people was taken based on random sampling. The dependent variable of the research is volleyball underhand passing ability. The intervening variable is body flexibility. The independent variables are arm strength and leg strength. The research method is a descriptive method, with a path analysis research design. The research data were analyzed using correlation and regression techniques at a significance level of 95%. The results of the research show that: (1) There is a direct influence of arm strength on body flexibility in students ($\beta = 0.555$ with a significance level of $0.001 < \alpha 0.05$). (2) There is a direct influence of leg strength on flexibility in students ($\beta = 0.407$ with a significance level of $0.011 < \alpha 0.05$). (3) There is a direct influence of arm strength on underhand passing ability in volleyball among students ($\beta = 0.343$ with a significance level of $0.018 < \alpha 0.05$). (4) There is a direct influence of leg strength on underhand passing ability in volleyball among students ($\beta = 0.266$ with a significance level of $0.041 < \alpha 0.05$). (5) There is a direct influence of body flexibility on underhand passing ability in volleyball among students ($\beta = 0.390$ with a significance level of $0.011 < \alpha 0.05$). (6) There is no influence of arm strength on the ability to pass down in volleyball through body flexibility in students ($\beta = 0.216 < 0.343$). (7) There is no influence of leg strength on underhand passing ability in volleyball through body flexibility in students or a group of students ($\beta = 0.159 < 0.266$).

Keywords: Arm Strength; Leg Strength; Body Flexibility; Underhand Passing; Volleyball.

INTRODUCTION

The game of volleyball is a sport that is very popular among levels of society in South Sulawesi in general and Makassar City in particular. This game has developed from cities to remote villages and can be played by various age levels, both boys and girls (Kasriadi &

Irawan, 2019). The development of this sport is because this sport has its charm (Urahman & Hidayat, 2019) where the movements contain artistic elements of beauty and might (Marsiyem et al., 2018), such as serving which can be done with an upper serve or a lower serve with easy (Syarkowi, 2017), with accurate ball placement, apart from that you can make smash movements quickly and strongly, block your opponent's attacks, even when defending, you can take/reach even difficult balls, so the movements are very interesting (Pratiwi & Prayogs, 2019). The increasing development of this sport will provide opportunities for players to excel at a higher level (Devi & Rifki, 2019).

Volleyball is a sport, if you want to become a skilled player, every player must master the basic techniques involved (Baqer & Bawono, 2019). These basic techniques include; (1) In volleyball, accurate serves are needed. A serve is an opening for an attack and can also cause difficulties for the opponent when receiving the serve (Subakti, 2017). (2) Top passing and underhand passing in volleyball are important things to master (Chan & Indrayeni, 2018). In attacking situations, the upper passing technique is more often used to provide feedback to friends who are ready to make a lower pass (Rithaudin & Hartati, 2016), while lower passing is more often used in defensive situations (Satria, 2019). Another basic technique is (3) In volleyball, underhand passing is very important to get points (Karim et al., 2017). Strong and accurate underhand passing is needed so that it is not easy for the opponent to block (Saputra & Gusniar, 2019). The last basic technique is (4) The block technique is used to stem the opponent's attacks through under-passing through under-passing (Haprabu, 2017). Of the many basic volleyball techniques, in this study, the researcher wants to try to discuss the issue of volleyball underpassing ability.

The basic techniques of volleyball skills are so important, especially the basic underpassing techniques that will be discussed in this research, that it is necessary to explore the factors that support mastering the basic volleyball underpassing techniques (Rahmat & Wahidi, 2018). Efforts to improve or achieve achievements in volleyball by mastering basic techniques, especially underhand passing techniques (Jahrir, 2019), of course, require training that is supported by other elements such as; facilities/ infrastructure that have national standards, related government support, as well as physical components, which are closely related to volleyball passing (Hambali, 2019). Volleyball is a sport that requires elements of body strength and flexibility (Hamzah et al., 2019). This opinion reflects that the physical component plays an important role in the game of volleyball (Abrasyi et al., 2018). The physical component is associated with the activity of playing volleyball (Atsani, 2020)v, so the most determinant footing is the physical elements that follow the characteristics of the

volleyball underpassing movement pattern to support achievement and maximum performance (Utomo, 2019). The physical components that are expected to influence the movement patterns of volleyball underpassing skills (Kusnadi & Gani, 2020) include; arm strength, leg strength, and flexibility, without ignoring other physical components that also support volleyball underhand passing movement patterns (Afdi et al., 2019).

Arm strength in volleyball underpassing is the ability of the physical component that produces strength in the arm muscles (Utomo, 2019) from flexion and extension movements of the arm which has an axis at the elbow joint (Ikadarny & Karim, 2020), thereby producing static contraction strength (isometric) when making a volleyball underhand pass (Herman, 2019). Leg strength is the ability of the leg muscles to overcome resistance with dynamic contractions (isotonic) when passing down (Jahrir, 2019). The leg strength in question is the result of contraction through extension movements which have an axis at the knee joint, resulting in strength in the front thigh muscle group (muscle quadriceps group) (Ikadarny & Karim, 2020). On the other hand, flexibility also greatly influences the characteristics of volleyball underpassing movement patterns. A player or a group of volleyball players, even though they have strong arms and legs, if they are not supported by good body flexibility, will not be optimal in controlling the lower passing movement, the result of the lower passing will be wild and the direction will not be as expected (Partini, 2019).

In this research, the author wants to try to research the physical components (arm strength, leg strength, and flexibility) which will see their influence on the volleyball underpassing ability of students at SMA Negeri 9 Makassar, although these three physical components have an effect on the volleyball underpassing ability, but as far as It is not yet known how big the influence is, this is the background to the problem of finding out a clearer influence on the three physical components. Based on the researchers' observations, the quality of volleyball playing among students at SMA Negeri 9 Makassar is still not good because there are still many techniques. the basics of volleyball that teachers need to pay attention to and teach to their students. From the results of the researcher's observations at every championship held in Luwu Regency, students at SMA Negeri 9 Makassar never showed results as expected due to their lack of ability to underpass.

METHOD

This type of research is descriptive using path analysis to find out the effect of arm strength, leg strength and body flexibility on underhand passing ability in volleyball. To

support the above purpose, for data analysis, path analysis is used. In this study, the variables that will be researched or investigated are the independent variable, namely: arm strength (X1) and leg strength (X2), the intermediate variable, namely: body flexibility (X3), and the dependent variable, namely: underhand passing volleyball (Y). This research is a descriptive study using path analysis, which aims to determine whether there is a direct influence of arm strength, leg strength, and body flexibility on underhand passing ability in volleyball. Thus, the research design model used can be seen in the image below:

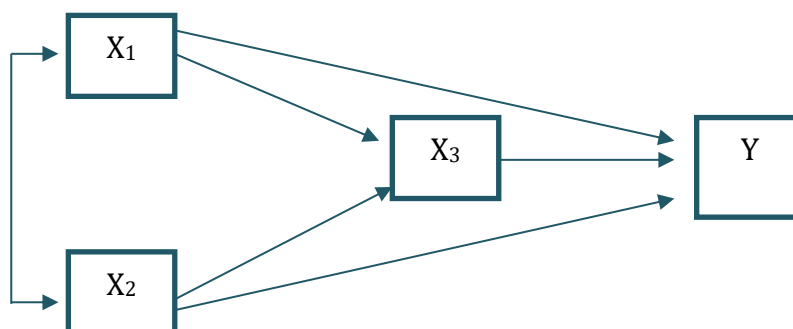


Figure 1.
Research design

The population who were research subjects were students of SMA Negeri 9 Makassar. The reasons and use of samples are limited time, energy, and large population. Because the population of this study is relatively large, the sample selection technique used was simple random sampling by lottery, so a sample size of 30 people was obtained.

The test instruments used to measure the independent variable, intermediate variable and dependent variable are as follows: (1) The instrument used to measure arm strength is the push-up test instrument, (2) The instrument used to measure leg strength is the squat jump test instrument (half squat jump test), (3) The instrument used to measure body flexibility is the standing-bending-rich flexibility test instrument, and (4) The instrument used to measure volleyball underhand passing ability is the underhand passing ability test instrument volleyball.

The collected research data needs to be analyzed descriptively and inferentially to test research hypotheses. The descriptions used in this research are as follows:

1. Descriptive data analysis is intended to get a general picture of the data which includes total value, range, average, standard deviation, minimum and maximum values.
2. The data normality test is intended as a prerequisite test with a p-value > 0.05.
3. Inferential analysis is used to test research hypotheses using correlation and regression tests.

RESULTS AND DISCUSSION

To get a general picture of the research data, descriptive data analysis was used on data on arm strength, leg strength, body flexibility and students' volleyball underhand passing ability. 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 analysis of data on arm strength, leg strength, body flexibility, and volleyball underhand passing ability in students

Variable	N	Sum	Mean	Stdv	Variance	Range	Min.	Max
Arm Strength	30	370,00	12,3333	2,42345	6,368	8,00	9,00	17,00
Leg Strength	30	634,00	21,1333	2,45979	6,051	9,00	17,00	26,00
Body Flexibility	30	341,00	11,3667	4,78131	22,861	17,00	2,00	19,00
Volleyball Underpass	30	325,00	10,8333	2,49252	6,213	8,00	7,00	15,00

Data normality test

The results of testing the normality of data on the variables of arm strength, leg strength, body flexibility, and volleyball passing ability in students can be seen in the following table:

Table 2.

Results of normality testing of variable data for arm strength, leg strength, body flexibility, and volleyball underhand passing ability in students

Variable	KS-Z	P	α	Information
Arm Strength	1,018	0,251	0,05	Normal
Leg Strength	0,768	0,595	0,05	Normal
Body Flexibility	0,745	0,635	0,05	Normal
Volleyball Underpass	0,926	0,358	0,05	Normal

Analysis of the linearity of arm strength on body flexibility in students

Testing the linearity of the arm strength variable on body flexibility was carried out to determine whether arm strength and body flexibility had a linear relationship or not significantly. The results of testing the linearity of arm strength variables on body flexibility can be seen in the following table:

Table 3.

Results of linearity test of arm strength on body flexibility in students

Variable	F _{count}	F _{table}	P	α	Information
Arm Strength Body Flexibility	1,993	2,488	0,105	0,05	Linear

From the results of Table 3 above, there is a relationship between arm strength and body flexibility in students at SMA Negeri 9 Makassar. $F_{count} = 1.993 < F_{table} = 2.488$

with a significance level $(P) > \alpha 0.05$. So, arm strength and body flexibility in SMA Negeri 9 Makassar students were found to have a linear relationship.

Analysis of the linearity of leg strength on body flexibility in students

Testing the linearity of the leg strength variable on body flexibility was carried out to determine whether leg strength and body flexibility had a linear relationship or not significantly. The results of testing the linearity of leg strength variables on body flexibility can be seen in the following table:

Table 4.
 Results of the linearity test of leg strength on body flexibility in students

Variable	F _{count}	F _{table}	P	α	Information
Leg Strength Body Flexibility	1,419	2,447	0,249	0,05	Linear

From the results of table 4. above, the relationship between leg strength and body flexibility in students at SMA Negeri 9 Makassar. $F_{count} = 1.419 < F_{table} = 2.447$ with a significance level $(P) > \alpha 0.05$. So, leg strength and body flexibility in SMA Negeri 9 Makassar students were found to have a linear relationship.

Analysis of the linearity of arm strength on students' volleyball underhand passing ability

Testing the linearity of the arm strength variable on down passing ability in volleyball was carried out to find out whether arm strength and down passing ability in volleyball had a linear relationship or not significantly. The results of testing the linearity of arm strength variables on down-passing ability in volleyball can be seen in the following table:

Table 5
 Results of the linearity test of arm strength on students' volleyball underhand passing ability

Variable	F _{count}	F _{table}	P	α	Information
Arm Strength Volleyball Underpass	1,785	2,488	0,143	0,05	Linear

From the results of Table 5 above, there is a relationship between arm strength and volleyball underhand passing ability among students at SMA Negeri 9 Makassar. $F_{count} = 1.785 < F_{table} = 2.488$ with a significance level $(P) > \alpha 0.05$. So, it was found that arm strength and volleyball underhand passing ability in students at SMA Negeri 9 Makassar had a linear relationship.

Analysis of the linearity of leg strength on students' volleyball underhand passing ability

Testing the linearity of the variable leg strength on underhand passing ability in volleyball was carried out to determine whether leg strength and underhand passing ability

in volleyball had a linear relationship or not. The results of testing the linearity of leg strength variables on underhand passing ability in volleyball can be seen in the following table:

Table 6.
 Results of the linearity test of leg strength on students' volleyball passing ability

Variable	F _{count}	F _{table}	P	α	Information
Leg strength Volleyball Underpass	0,630	2,447	0,743	0,05	Linear

From the results of Table 6 above, the relationship between leg strength and volleyball underhand passing ability of students at SMA Negeri 9 Makassar. $F_{count} = 0.630 < F_{table} = 2.447$ with a significance level $(P) > \alpha 0.05$. So, leg strength and volleyball passing ability in students at SMA Negeri 9 Makassar were found to have a linear relationship.

Analysis of the linearity of body flexibility on students' volleyball underhand passing ability.

Testing the linearity of body flexibility variables on underhand passing ability in volleyball was carried out to find out whether body flexibility and underhand passing ability in volleyball had a linear relationship or not significantly. The results of testing the linearity of body flexibility variables on underhand passing ability in volleyball can be seen in the following table:

Table 7.
 Results of the linearity test of body flexibility on students' volleyball passing ability

Variable	F _{count}	F _{table}	P	α	Information
Body Flexibility Volleyball Underpass	1,416	2,413	0,251	0,05	Linear

From the results of Table 7 above, body flexibility influences students' volleyball underhand passing ability. $F_{count} = 1.416 < F_{table} = 2.413$ with a significance level $(P) > \alpha 0.05$. So, body flexibility in students' volleyball underhand passing ability is found to have a linear relationship.

Hypothesis test

This research derived seven hypotheses, the truth of which had to be tested using inferential statistical analysis, namely by using Path Analysis. In sequence, the hypotheses in this research can be expressed as follows:

Hypothesis testing from the data for each variable put forward in the hypothesis was carried out using SPSS version 20. The results obtained can be seen in the model I structural equation coefficient table as follows:

Table 8.

Results of multivariate analysis of structural regression I variables of arm strength and leg strength on body flexibility.

Variable	β	P	α
Arm strength Body flexibility	0,555	0,001	0,05
Leg strength Body flexibility	0,407	0,011	0,05

The equation above is said to be suitable for use because the P value in the test is $< \alpha 0.05$. From the coefficient table for Sub-Structural Model 1 above, the structural equation coefficient value for the arm strength variable on body flexibility is 0.555. Meanwhile, the significant value obtained for the arm strength variable was 0.001. Because the significant value is less than $\alpha 0.05$ ($0.001 < \alpha 0.05$), it can be decided that H0 is rejected. This means that there is a significant direct influence of arm strength on body flexibility.

The structural equation coefficient obtained for the leg strength variable on body flexibility is 0.407. Meanwhile, the significant value obtained was 0.011. Because the significance value is less than $\alpha 0.05$ ($0.011 < \alpha 0.05$), it can be concluded that H0 is rejected. This means that there is a significant direct influence of leg strength on body flexibility.

Table 9.

Results of analysis of the sub-structural coefficient of Determination I

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935 ^a	.873	.864	1.76314

Based on the results obtained from the table above, the error coefficient can be calculated:

$$\varepsilon_1 = \sqrt{1 - R^2} = \sqrt{1 - 0,873} = \sqrt{0,127} = 0,356$$

Sub-Structural Hypothesis Testing II

Based on the hypothesis proposed above, the results of data processing using the SPSS version 20 program for this hypothesis can be seen in the following table:

Table 10.

Results of multivariate analysis of structural regression II variables arm strength, leg strength, and body flexibility on down passing ability in volleyball

Variable	β	P	α
Arm Strength Underpass Volleyball	0,343	0,018	0,05
Leg strength Underpass Volleyball	0,266	0,041	0,05
Body Flexibility Underpass Volleyball	0,390	0,011	0,05

The coefficient value of the structural equation for the arm strength variable on underhand passing ability in volleyball is 0.343 with the significance obtained being 0.018. Because the significant value is less than $\alpha 0.05$ ($0.018 < \alpha 0.05$), it can be decided that H0 is rejected. This means that there is a significant direct influence of arm strength on underhand passing ability in volleyball.

The coefficient value of leg strength on underhand passing ability in volleyball is 0.266 with a significance value of 0.041. Because the significant value is less than $\alpha 0.05$ ($0.041 < \alpha 0.05$), it can be decided that H0 is rejected. This means that there is a significant direct influence of leg strength on underhand passing ability in volleyball.

The coefficient value of body flexibility on underhand passing ability in volleyball is 0.390 with a significance value of 0.011. Because the significant value is less than $\alpha 0.05$ ($0.011 < \alpha 0.05$), it can be decided that H0 is rejected. This means that there is a significant direct influence of body flexibility on underhand passing ability in volleyball.

Table 11.
 Results of analysis of the coefficient of determination of Sub Structural II

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.966 ^a	.933	.925	.68049

Based on the results obtained from Table 11 above, the error coefficient can be calculated:

$$\epsilon_2 = \sqrt{1 - R^2} = \sqrt{1 - 0,933} = \sqrt{0,067} = 0,259$$

Considering that in the path analysis design, there is an indirect influence, this hypothesis also needs to be tested whether it has a significant indirect influence or does not have a significant indirect influence. The coefficient that can explain the influence between these variables is the standardized beta coefficient. In this case, we will look at the results of the sixth hypothesis, namely the indirect influence of arm strength through body flexibility on down-passing ability in volleyball. The seventh hypothesis is the indirect influence of leg strength through body flexibility on underhand passing ability in volleyball.

The sixth hypothesis is to find out whether there is an indirect influence of arm strength through body flexibility on underhand passing ability in volleyball. It is known that the beta coefficient value of the direct influence of arm strength on body flexibility is 0.555 and the beta coefficient value of the direct influence of body flexibility on underhand passing ability in volleyball is 0.390. So the beta coefficient value of the indirect influence of arm strength through body flexibility on underhand passing ability in volleyball is ($0.555 \times 0.390 = 0.216$).

These results show that the beta coefficient value is smaller than the beta coefficient value of the direct influence of arm strength on underhand passing ability in volleyball, which is 0.343 ($0.216 < 0.343$). So it can be concluded that there is no influence between arm strength through body flexibility and underhand passing ability in volleyball.

The seventh hypothesis is to find out whether there is an indirect influence of leg strength through body flexibility on underhand passing ability in volleyball. It is known that the beta coefficient value of the direct influence of leg strength on body flexibility is 0.407. The beta coefficient value of the direct influence of body flexibility on underhand passing ability in volleyball is 0.390. So the beta coefficient value of the indirect influence of leg strength through body flexibility on underhand passing ability in volleyball is ($0.407 \times 0.390 = 0.159$). These results show that the beta coefficient value is smaller than the beta coefficient value of the direct influence of leg strength on underhand passing ability in volleyball, which is 0.266 ($0.159 < 0.266$). So it can be concluded that there is no influence between leg strength through body flexibility and underhand passing ability in volleyball.

Based on the test results for structural I and structural II, the results of the overall variable path diagram are as follows:

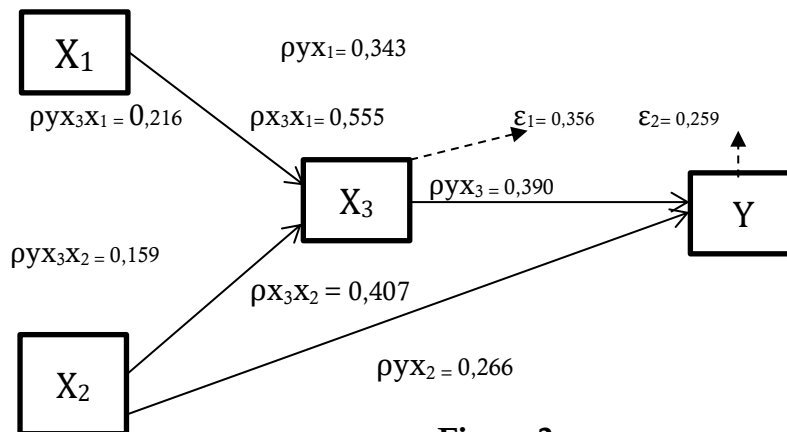


Figure 2.
 Model test results for sub-structural I and sub-structural II

Discussion

There is a direct influence of arm strength on body flexibility in students

Based on the results of the hypothesis test carried out, the significance value obtained was 0.001. Because the significance value is smaller than 0.05 ($0.001 < 0.05$), the null hypothesis (H_0) which states there is no effect is rejected and the alternative hypothesis (H_1) which states there is an effect is accepted. This is in line with the opinion of Djoko Pekik Irianto (2002) that: Muscle strength can be defined as the ability of a muscle or group of muscles to overcome resistance, whereas Harsono (1988) states that arm muscle strength

is the ability of the arm muscles to generate resistance. stress in a resistance. In the expert's opinion above, it can be said that good arm strength will be supported by good body flexibility, meaning that a student or group of students who have good flexibility can stretch the muscles in the arm area with a wider range of motion in the joints, p. This will produce greater strength and can control the strength of the arms in carrying out certain movement patterns in sports skills. Thus, arm strength has a significant influence on body flexibility in students at SMA Negeri 9 Makassar.

There is a direct influence of leg strength on body flexibility in students

Based on the results of the hypothesis test carried out, the significance value obtained was 0.011. Because the significance value is smaller than 0.05 ($0.011 < 0.05$), the hypothesis that states there is no influence (H_0) is rejected, and the hypothesis that states there is an influence (H_1) is accepted. This follows the opinion of Gardner et al (1995) that: "argued that the lower limbs are connected to the body by a joint ring". From the expert opinion above, it can be concluded that if leg strength is good then it is supported by good body flexibility too. Therefore, increasing leg strength must be supported by good body flexibility. Flexibility is obtained after warm-up and long training so that you will get muscles that have wider joint movement. If you do a sports activity without warming up first, it will cause stiffness in the ligaments and ligaments or tendons, and imbalance in movement, besides that it is easy for injury to occur. The movement of muscle groups in one direction, and other muscles moving in the opposite direction, these muscles are called antagonistic muscles. These muscle groups must have even abilities, if one is stronger than the other muscles an imbalance will arise. Stronger muscles will overpower weak muscles, causing damage to the tendon fibers. The treatment is to strengthen weak muscles and stretch strong muscles. If a player does not have good body flexibility, it will affect leg strength, in other words, body flexibility is needed to develop leg strength. Thus, leg strength has a significant influence on body flexibility in students at SMA Negeri 9 Makassar.

There is a direct influence of arm strength on students' volleyball passing ability.

Based on the results of the hypothesis test carried out, the significant value obtained was 0.018. Because the significant value is smaller than 0.05 ($0.018 < 0.05$), the proposed hypothesis is accepted, or H_0 which states there is no effect is rejected and H_1 is accepted. This is in line with what Harsono (1988) stated: "Arm muscle strength is the ability of the arm muscles to generate tension in a resistance". Meanwhile, according to Len Kravitz (2001): "muscle strength is the ability of muscles to use maximum power to lift weights".

From the expert opinions above, it can be concluded that if arm strength is good, passing under the ball will be easier to control. Therefore, in developing the ability to pass down in volleyball, it must be accompanied by the ability to be in good physical condition such as arm strength. If a player does not have good arm muscle strength then his downward passing will not be perfect. In other words, arm muscle strength is needed in the lower passing movement pattern in volleyball. Thus, arm muscle strength has a significant influence on the underhand passing ability of students at SMA Negeri 9 Makassar.

There is a direct influence of leg strength on students' volleyball passing ability.

Based on the results of the hypothesis test carried out, the significant value obtained was 0.041. Because the significant value is smaller than 0.05 ($0.041 < 0.05$), the proposed hypothesis is accepted, or H_0 which states there is no effect is rejected and H_1 is accepted. In the opinion of Gardner et al (1995) that: "The lower limbs are connected to the body by a joint ring". From the expert opinion above, it can be concluded that the leg strength in question is the strength resulting from contraction of the axis-extension movement at the knee joint (articulatio genus). On the other hand, one of the lower passing movement patterns in volleyball is making extension movements on the legs, meaning that in carrying out the lower passing movement the strength of the legs plays a role in directing the ball as desired, the hands only control. If the ball is desired to soar high, then the legs are moved in conjunction with hand movements as control. Thus, leg strength has a significant influence on the volleyball passing ability of SMA Negeri 9 Makassar students.

There is a direct influence of body flexibility on students' volleyball passing ability.

Based on the results of the hypothesis test carried out, the significant value obtained was 0.011. Because the significant value is smaller than 0.05 ($0.011 < 0.05$), the proposed hypothesis is accepted, or H_0 which states there is no effect is rejected and H_1 is accepted. Flexibility can be interpreted as a person's ability to carry out physical activities which is determined by the extent of movement in their joints. From the definition above, it can be said that if a player has good body flexibility, his lower passing movement will be more perfect. This means that the lower passing movement pattern, apart from moving both arms and legs simultaneously, is no less important in moving the stick forward. To be able to move the articulation forward requires flexibility in the articulation of the abdominal articulation. The lower passing movement pattern is not only towards the front but sometimes you have to move to the right and left. This requires togok flexibility which is closely related to the abdominal muscle group (abdominal muscle group), especially the front abdominal muscles

(rectus abdominis). By having flexibility in the togok area, a player can easily move forward, to the right and left without any stiffness. Thus, body flexibility has a significant influence on the volleyball passing ability of SMA Negeri 9 Makassar students.

There is no influence of arm strength through body flexibility on students' volleyball passing ability through body flexibility.

Based on the results of the hypothesis test carried out, the beta coefficient value obtained was 0.216. Because the beta coefficient value obtained is smaller compared to the beta coefficient of the direct influence of arm strength on underhand passing ability in volleyball, namely 0.343 ($0.216 < 0.343$), the proposed hypothesis is rejected or H_0 which states there is no effect accepted and H_1 is rejected. This means that the ability to pass down in volleyball which is influenced by arm strength will not increase if it is also influenced by body flexibility. If connected based on the third hypothesis, there is a direct influence of arm strength on underhand passing ability in volleyball. If it is also influenced by body flexibility, then the influence of body flexibility can be said to have no potential to improve the ability to pass down in volleyball. As is known, arm strength is a person's ability to face a prisoner. Likewise, body flexibility, with good body flexibility, will not affect a student's passing ability in volleyball. Thus, there is no influence of arm strength through body flexibility on the volleyball passing ability of students at SMA Negeri 9 Makassar.

There is no influence of leg strength through body flexibility on students' volleyball passing ability.

Based on the results of the hypothesis test carried out, the beta coefficient value obtained was 0.159. Because the beta coefficient value obtained is smaller compared to the beta coefficient of the direct influence of leg strength on underhand passing ability in volleyball, namely 0.266 ($0.159 < 0.266$), the proposed hypothesis is rejected or H_0 which states there is no effect accepted and H_1 is rejected. This means that the ability to pass down in volleyball, which is influenced by leg strength, will not increase if it is also influenced by body flexibility. Based on the fourth hypothesis where there is a significant direct influence of leg strength on down-passing ability in volleyball games, it can be said that the influence of body flexibility has no potential to increase down-passing ability in volleyball games. As is known, strength is a person's ability to face a prisoner. Likewise with body flexibility, good body flexibility does not affect a volleyball player being ability to perform optimally when competing. Thus, there is no influence of leg strength through body flexibility on the underhand passing ability in volleyball for students at SMA Negeri 9 Makassar.

This means that to become a volleyball player, many factors can influence, apart from arm strength, leg strength and body flexibility, so when we already have the capital to become a volleyball player, it's a good idea to pay attention to physical condition factors such as arm strength, power. limbs and body flexibility that we have. Based on this research, the factors of arm strength, leg strength and body flexibility play an important influence on underhand passing ability in volleyball. However, apart from that, other factors also need to be considered. Because in any sport, physical, technical, tactical and mental factors are the most necessary basis for becoming an accomplished athlete.

CONCLUSIONS AND SUGGESTIONS

Based on the research results and discussions that have been presented, the following conclusions can be drawn:

1. There is a direct influence of arm strength on body flexibility in students.
2. There is a direct influence of leg strength on body flexibility in students.
3. There is a direct influence of arm strength on students' volleyball underhand passing ability.
4. There is a direct influence of leg strength on students' volleyball underhand passing ability.
5. There is a direct influence of body flexibility on students' volleyball underhand passing ability.
6. There is no influence of arm strength through body flexibility on students' volleyball underhand passing ability.
7. There is no influence of leg strength through body flexibility on students' volleyball underhand passing ability.

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