

Contribution Of Grip Strength And Back Muscle Flexibility To Slice Service Accuracy In Tennis Court Ukm Muhammadiyah University Of Surakarta

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Abstract.

The study aims to analyze the contribution of grip strength and back muscle flexibility to slice service accuracy in tennis court UKM Muhammadiyah University of Surakarta. The population and samples used were Students with Interests, Talents, tennis court the Sports Education Muhammadiyah University of Surakarta, totaling 14 students with sampling technique is purposive sampling. While research sampling techniques using systematic random sampling with a type of systematic random sampling. This is seen from the results of the analysis obtained the value Rsquare 0.369 or (36.9%) with a probability level of $0.369 > \alpha 0.05$, which is explained through the regression equation value $\hat{Y} = 10.124 + 0.409 X_1 + 0.435 X_2$. These results show that there is a contribution of grip strength and muscle flexion to the accuracy of the slice service in UMS court tennis UKM. Third hypothesis result: there is a significant contribution together between grip strength and muscle flexion together to the precision of the slice service in UKM tennis court UMS. These results show that the strength of the grip and flexibility of the muscles together in UMS court tennis UKM increase simultaneously, it will also be followed by an increase in the accuracy of the slice service in the sport of court tennis. Thus, the strength of the grip and flexibility of the muscles is a combination of two components of physical ability that need attention in court tennis in the future.

Keywords: *grip strength, back muscle-flexing, and slice serve.*

I. INTRODUCTION

Sports is also interpreted as a physical activity that is widely carried out by the whole community, in a pandemic state its existence is no longer considered as just a mere formality now it is a necessary exercise to maintain immunity. One example of a sport that is trending in the pandemic period is cycling, running small. However, sports activities that can be done are not only one of the sports branches that are favored by the public is the sport of court tennis. Through the sport of tennis, the community benefits, both mental, social, and physical growth. The game of court tennis has progressed rapidly, with the rise of tennis clubs, referee training. This game of tennis develops in school children, especially at the high school level, and this sport already has some in school made one of the extracurricular. Indirectly the existence of this tennis game realizes national development, namely human development that is of good quality soul and body. According to Irawan "Tennis is a game that uses balls and

rackets and is played on a rectangular court that has a flat or flat surface. This tennis court is approximately 260.7569 m² which is divided into two parts equal to using the net as a barrier"[1]. This tennis game is done on a court with a hard court, clay (gravel), and grasscourt Service in the game of court tennis several types of serves can be used in opinion there are three types of serves, namely: slice, twist, and flat"[2].

Slice service is a service technique by cutting or snapping to get the ball spin. When servicing this slice, the racket touches the ball on the top right and the ball is hit with a round of racket from right to left for the left-handed player, for the left-handed opposite. [3] Serving in the game of court tennis according to there are several types of serves that can be used There are three types of serves, namely: slice, twist, and flat. Slice service is a service technique by cutting or snapping to get a round of the ball. When serving this slice, the racket touches the ball on the top right and the ball is hit with a round of racket from right to left for the left-handed player, for the left-handed opposite. A well-directed serve provides two advantages: by serving towards the opponent's weakness, you can win several points directly or force the opponent to make weak shots and can be hit into the corners of the field" [4]. It was one of the opening blows of the game. Every serve blow is very important for the player, points will not be earned without serving. In addition to one of the opening blows of a game According to Irawadi, "Service slice is the initial punch in play, also often used as a weapon to get points". From these considerations, the author chose the slice service as research material [5]. The slice service punch technique where the slice service is done by cutting or by swiping to get a sideways round of the ball is also called side spin. The success of a service punch is influenced by several, namely standing attitude, ball hull, the accuracy of punches, step patterns, and racket swings. In addition to some of the factors mentioned above, other factors that affect the implementation of service blows are physical conditions. Physical condition is a unified whole of components that cannot be separated from qualified performance [6]–[9].

Physical components consist of strength, agility, explosive power, flexibility, flexibility, speed, balance, condition, and those related to the components of physical condition. The study took one component of physical strength and flexibility. Strength is a person's physical condition about his ability without muscles to accept loads while working, while flexibility is a person's ability to move the body or parts in the widest possible range of motion, experiencing injuries to the joints and muscles around the joints. The strength of the racket grip affects the surface of the racket when touching the ball. The right and correct grip will give a good taste in the hand and can hit the ball in the desired direction, but must first practice being able to carry out the swing of the racket well. In the grip where the muscles, especially the fingers, have an important role. Flexibility is one of the defining elements of physical condition in learning movement skills, preventing injury, developing strength, speed, endurance, and coordination." Flexibility is a person's ability to carry out movements with a wide amplitude." It can be concluded that the flexibility of ability concerns the distance of

motion or range of motion. The definition of accuracy is an attempt to control the direction of the slice service by the desired purpose. From the results of the third hypothesis test can be argued that there is a contribution of grip strength and muscle flexibility to the accuracy of the slice service in UKM tennis court UMS. The results of research on strength training have become one of the most popular physical activities to improve characteristics such as absolute muscle strength, endurance, hypertrophy, and muscle strength [10]–[15]. Then stretching exercises are usually part of a warm-up routine before engaging in competitive sports and physical activity. It is believed that its use will improve subsequent performance, reduce the risk of injury, and relieve symptoms of muscle pain [16]–[19]. Based on the phenomenon in the form of these facts, the researchers researched the Contribution of Grip Strength and Back Muscle Flexibility to the Accuracy of Slice Services in UMS Tennis Field UKM

II. METHODS

This research section uses quantitative methods. The quantitative method is one type of research that is planned, structured, and systematic. This study method used quantitative methods using this type of correlation research, which wanted to investigate how much the contribution between free variables and bound variables. The free variables are grip strength (X_1), waist flexibility (X_2) and the bound variable is the accuracy of the slice service (Y) in UMS court tennis UKM.

III. RESULT AND DISCUSSION

A. RESULT

Empirical data obtained through tests and measurements consisting of: grip strength and flexion of the back muscles to the accuracy of the *slice* service in UKM tennis court UMS, analysis is intended to obtain the results of hypothesis testing proposed in this study.

1. Contribution of grip strength to the precision of slice serve in UMS court tennis UKM

Table 1. Contribute grip strength to the accuracy of slice service in UMS court tennis UKM

Number of observai (n)	Rsquare (R_{y1})	F-count	F-table
14	0,189	2.803	4,75

Based on the results of the regression significance test known $F_{count} = 2,803$ smaller than $F_{table} (1:12) = 4.75$ in $\alpha = 0.05$, it can be concluded that the regression coefficient between grip strength to the accuracy of the service slice in UMS(R_{y1}) court tennis UKM is 0.189 or 18.9%. Based on the above the results of the regression significance test known $F_{calculated} = 2,803$ smaller than the $F_{table(1:12)}=4.75$ in $\alpha = 0.05$, it can be concluded that the regression coefficient between grip strengthening to the accuracy of the slice service in UMS tennis court UKM (R_{y1}) of 0,189 or 18. 9%. This

result shows the meaning that grip strength is an important physical component so that the ability to serve *slices* can be done properly and correctly.

2. Contribution of back muscle flexing to the precision of *the slice* service in UMS court tennis UKM

Table 2. contribution of muscle flexibility to the accuracy of the slice service in UKM tennis court UMS.

Number of observai (n)	Rsquare (R _{y12})	F _{-count}	F _{-table}
14	0,250	4,000	4,75

Based on the above the results of the regression significance test known $F_{\text{calculate}} = 4,000$ smaller than the table $F_{(1:12)} = 4.75$ in $\alpha = 0.05$, it can be concluded that the regression coefficient between the flexion of the back muscles to the accuracy of the slice service in UMS (R_{y2}) court tennis UKM is 0,250 or 25%. Thus it can be concluded that the contribution of the back muscles to the accuracy of the service *slice* in UKM tennis court UMS by 25%. These results show that the flexibility of the back muscles is an important physical component so that the accuracy of the *slice* service can be done properly and correctly.

3. Contribution of grip strength and muscle flexing to the precision of the slice service in UKM tennis court UMS

Table 3. Contribution of grip strength and muscle flexing to the precision of the slice service in UKM tennis court UMS

Number of observai (n)	Rsquare(R _{y12})	F _{-count}	F _{-table}
15	0,369	3,217	3,8

Based on the results of the double regression significance test known $F_{\text{count}} = 3,217$ smaller than the $F_{\text{tabel}} (2:11) = 3.8$ in $\alpha = 0.05$, it can be concluded that the regression coefficient between the strength of the grip and the flexion of the back muscles to the accuracy of the service slice in the UMS (R_{y12}) court tennis UKM is 0.369 or by 36.9%. Thus it can be concluded that the contribution of grip strength to the accuracy of the slice service in UMS court tennis UKM is 63.1%. These results show that there is a contribution of grip strength and muscle flexion to the accuracy of the slice service in UMS court tennis UKM.

B. DISCUSSION

Based on the analysis of the contribution analysis of both free variables with one variable bound in hypothesis testing needs to be studied further by achieving the relationship between the results of the analysis achieved by the theories underlying this study. This explanation is needed so that it can be known the conformity of the theories put forward with the results of the research obtained. The results of the grip strength test on the accuracy of the slice serve there is a significant contribution between the strength of the grip to the accuracy of the slice service in UKM tennis court UMS, the increase in grip strength will be followed by an increase in the accuracy of the slice service in UMS court tennis UKM. Grip strength becomes the determining factor in

various sports badminton and so on. Linking the above theory with the results of this study, it is very clear that grip strength has a relationship with the accuracy of *slice* service. Strength is one element of physical condition that has an important role in sports activities, both as a supporting element in a particular motion and the main element in the effort to achieve perfect motion techniques is strength.

Force is the energy used to change the state of motion or shape of an object [20]. These results suggest that to increase grip strength with the precision of the slice service, it must have an indicator of increased grip strength that supports the occurrence of movement by combining several abilities with appropriate and controlled rhythm to produce effective and efficient movement [21] What has been produced in this study, which shows a link between grip strength and the precision of slice service, becomes a reference in improving the accuracy of slice services in the UKM tennis court. From the results of the second variable test, it can be argued that there is a contribution of muscle flexibility to the accuracy of slice service in UKM tennis court UMS. This can happen because when serving a slice the flexing of the back muscles is needed so that when servicing the slice can react quickly and precisely on the desired target. [22].

These results indicate that to improve balance with the ability to serve slices, it must have indicators of the flexibility of the back muscles that support the accuracy of the slice service. From the results of the third variable test, it can be argued that there is a contribution of grip strength and muscle flexibility to the accuracy of the slice service in UKM tennis court UMS. These results show that the strength of the grip and flexibility of the muscles together in UMS tennis court UKM increase simultaneously, it will also be followed by an increase in the accuracy of the service slice in the sport of court tennis. Thus, the strength of the grip and flexibility of the muscles is a combination of two components of physical ability that need attention in court tennis in the future. What has been produced in this study, which shows a significant link between grip strength and muscle flexing to the accuracy of the serve slice in UMS court tennis UKM by 36.9%.

IV. CONCLUSION

Research that has been conducted on the contribution of grip strength and back muscle flexibility to the accuracy of slice service in UMS tennis UKM, it can be concluded that: (i) Grip strength contributes to the accuracy of the slice service in UKM tennis court UMS obtained a value of 0.189 which means 18.9% of the variable service accuracy slice (Y) is caused by grip strength (X_1); (ii) The suppleness of the back muscles contributed to the accuracy of the service slice in UKM tennis court UMS obtained a value of 0.189 which means 18.9%. the variable precision of the slice service (Y) is caused by the flexing of the back muscles (X_2); and (iii) The contribution of grip strength and back muscle flexibility contributes simultaneously or together to the accuracy of the service slice in UKM tennis court UMS obtained a value of 0.369

which means 36.9% of the variable service accuracy slice (Y) is caused by grip strength (X_1) and back muscle flexion (X_2).

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