

The Analysis of the Human Physical Components Against the Students Psychomotor Ability to Kick the Ball in Soccer Games at SDN 23 Kanaungan Labbakkang, Pangkep Regency

La Kamadi^{1,*}, Hasyim¹

¹Sport Science Faculty, Universitas Negeri Makassar, Makassar, Indonesia

*Corresponding author. Email: lakamadi59@gmail.com

ABSTRACT

This article describes the human physical components' contribution to kick a ball in soccer games for students at primary school. This research uses descriptive analysis with two variables used in this study: the independent variable is the human physical component of leg power, and abdominal muscle strength and the dependent variable is the ability to kick a ball. This research was conducted at SDN 23 Kanaungan Labbakkang, Pangkep Regency. All students at the school were the population. In comparison, the researchers used Simple Random Sampling by lottery to take samples as many as 40 students. The technique of analysis used is a single correlation (r) and multiple correlations (R) using the SPSS Version 22.00 at a significant level of 95% or $\alpha = 0.05$. The first result showed that there is significant contribution of the leg power to the kickball ability. The value of the contribution is 63%. While the contribution abdominal muscle strength to the ability to kick the ball is 73.1%. The third point is the simultaneous contribution of the physical components of leg power and abdominal muscle strength to kick a ball in the soccer game of elementary school students with a contribution value of 79.3%.

Keywords: Physical component, explosive leg power, abdominal muscle strength, kicking a ball

1. INTRODUCTION

1.1. Background

Achieving superior in sporting achievements events can influence positive directions such as athletes' sportsmanship at the local level, regional level, and international level. The sportsman is measure by the achievement of the athletes. As stated, the development of sports can be one of the barometers of increasing or decreasing the cultural life.

One of the popular sport in communities is soccer. A soccer is a team game, which consists of eleven players. This game is played in two innings (2 x 45 minutes) with a 10-minute break between two innings, and each team consists of 11 players, including a goalkeeper. As a popular game, soccer was chosen as the extracurricular activities of most elementary school students. Many students believe when they are useful in football, they will become famous in school. Students should master the basic soccer techniques. They have different long-

range kicking abilities because of their physical skills. Many children have hard, durable, and accurate kicks in practice, but they are not accurate in passing and have weak boots. Producing a proper kick requires coordination of swing movements, eyesight, footwear with the ball, and supported by excellent physical abilities, especially the explosive power of the leg muscles and the strength of the abdominal muscles.[1], [2].

One of the basic techniques that determine a team wins a match is kicking. A good kick in a soccer game requires the ability to predict the extent of the kick. The basic kicking technique must also have strong legs to kick with the desired distance and direction [3]. Just as in kicking style at a soccer game, it is influenced by physical components, namely the legs' explosive power and the strength of the abdominal muscles. In this case, the leg's explosive power is an active mover that will provide a change in the outcome of kicking the ball later. Here, the explosive power offers the function as a strength that gives the muscles pressure to exert pressure on the wear.

It will provide optimal muscular work to produce speed on the limb's swing that will result in the accurate far ball kick. In contrast, the abdominal muscle strength is the ability of muscles to contract to generate tension against the muscles' pressure. Doing the kick requires abdominal muscle strength and leg muscle power, making it possible to produce a full ball kick.

Kicking the ball is an attempt to move the ball from one place to another place by using the foot or part of the foot. The technical principles of kicking a ball are divided into four aspects. Firstly it is footrests. A fulcrum foot is a foot centered on the kick preparation and is the weight point's location. The knees of the foot are slightly bent, and the knee is straightened when kicking. The movement of the knees bent then rectified is a force pushing forward. Secondly, kicking feet with the ankle's condition that kicks the ball when kicking is strengthened or enforced, it cannot move.

While the kicking leg is lifted backward, then swung to the front of the foot used to kick the ball. Thirdly is part of the ball that was kicked. It determines the direction and course of the ball and the height of the ball's bounce. Fourth is body attitude. The posture of kicking is greatly influenced by the foot supporting the ball. The footrests' position right beside the ball, the body will lean slightly forward and this posture to kick the ball rolling the ground.

Furthermore, the position of the footrest is beside the ball. So when kicking, the weight is above the back of the ball so that the posture is leaning back, then the kick will soar high. The fifth is eyesight. Eyes mainly used to observe the situation or state of the game. However, when kicking a ball, the eye must look at the ball to be kicked. It means the ball kick away attempts to move or kick ball as far as possible. The ball kick distance is influenced by the leg length and its explosive power. It is also influenced by angle magnitude between movement speed and elevation angle.

The kicking is the most essential and fundamental skill that must be mastered in the game. Therefore, at the first time every player must learned the basic technique which is kicking the ball. Therefore, kicking the ball in a soccer game in principle can be done using the right foot or left foot, on 1) the inside of the foot, 2) the back of the foot, and 3) the outside of the foot [4].

1.2. The physical components that are significantly related to the kicking ball ability are leg power and stomach muscle strength

Explosive power is an element of human biometric knowledge which can be increased to certain limits by doing specific and appropriate exercises. Muscular power (muscular energy) is the ability of a person to exert maximum strength with his efforts mobilized in the shortest possible time. Leg power is also known as

explosive power, which is very much needed in various sports. The limbs' explosive power is one component of physical conditions in which the strength and speed of muscles are combined in a single pattern of motion [5].

Furthermore, the stomach muscle strength is the muscles' ability to contract to raise tension [6]. Specifically, in the ability to kick the ball, the type of power needed is the integration between the abdominal muscles' strength and flexibility to trigger the contraction of leg muscles to kick the ball.

2. RESEARCH METHODS

This research is descriptive with two variables used in this study. The independent variables are the physical component of explosive leg power, and the physical element of abdominal muscle strength. On the other hand, the dependent variable is the ability to kick the ball. The sample is a withdrawal from a portion of the population to represent the entire population. The sampling technique is a technique to determine the sample that will be used in research. The sampling method used was purposive sampling. The number of samples was 40 students obtained through purposive sampling. Then the sample is tested with the instrument.

2.1. Limb explosion power test

The test taker stands slightly over ± 10 cm on the repulsion board (start line). The first thing to do is to bent knee $\pm 45^\circ$ and both arms are put straight back. Then swing both arms forward while jumping as far as possible and landing on both feet. The jump's result is measured from the outside edge of the repulsion board (start line) to the nearest footprint. If the test taker falls or steps back after landing, the body's touch spot closest to the starting line is measured. The Testee is allowed to do this test 3 (three) times. The results recorded are the distance the jump reached by the Testee. It is measured from the Testee's toe's boundary to repulsion to the nearest point from the heel touch on the ground.

2.2. Stomach muscle strength test

The objective test is to measure muscle strength in the abdomen. The test facilities and tools are stopwatches, Blowgun, test floor, forms, and stationery. The guidelines for Performing Abdominal Muscle Strength Tests are :

- a. The Testee is in a supine position on the floor while the fingers are inserted under the head as a base. Both arms close together on the floor, both legs open + 30 cm, and both knees bent at an angle of + 45 degrees.
- b. The Testee helps to press both feet to keep the two heels in contact with the floor.
- c. On the "yes" clue, the Testee tries to sit while touching both knees with both feet. Then the Testee

returned to his original attitude. This movement is done repeatedly and as much as possible for 30 seconds.

The results recorded are when the Testee can make the sitting motion with the correct technique. Opportunity is given for value improvement. The best value of 2 repetitions becomes the value of the ability of the Sit Up testee.

2.3. The ability test to kick the ball in a soccer game

The objective test is to measure the ability to kick away in a soccer game. The test implementation of the test by using the guidelines:

- a. The test participant stands behind the ball, ready to take the kick.
- b. Then the Testee takes the ball as much as possible.
- c. In this implementation, when you want to do the kick, do the initial movement.
- d. Chance to kick three times.

The distance of the kick indicates the rating of the test. It is measured from where the ball was placed to where the ball fell. The ball is declared valid if the ball bounces. The best kick results as final data

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1. There is a contribution of explosive leg power to the ability to kick a ball in the soccer game

From the test results of regression analysis of physical component data on the ability to kick the ball, the regression coefficient value of 0.794 was obtained significant level of $0.000 < \alpha < 0.05$, for R square of 0.630. This means that 63% of the effect of leg power on the ability to kickball. The regression coefficient is obtained -6,351, or the physical component has a significant contribution to the ability to kick the ball in a soccer game for elementary school students. Testing the regression model showed an F value of 64,782, with a significant amount of $0,000 < \alpha < 0.05$. This means that the ability to kick a ball in a soccer game can be explained significantly by students' explosive power.

The results of statistical analysis are related to the theoretical foundation and the underlying mindset. The explosive power is the body's ability to allow a muscle or group of muscles to work explosively. Furthermore, the muscle power is the ability of a person to do maximum strength, with his efforts being mobilized in the shortest possible time. Leg power is also known as explosive power, which is very much needed in various sports. In

essence, leg power is one component of physical conditions where muscles' strength and speed are combined in a single pattern of motion [7]. The two critical elements in explosive power are muscle strength and muscle speed exerting maximum force to overcome resistance. Thus, it can be said that explosive power is the muscles' ability to move maximum strength in a fast time [8].

Leg muscle explosive power is an active activator that will change the outcome of kicking the ball later. Here, the explosive power provides the function as a strength giver for the muscles to exert pressure on the wear and provides optimal muscular work to produce speed on the limb's swing so that the result of the far ball kick can be achieved.

3.1.2. There is a contribution of abdominal muscle strength to the ability to kick a ball in a soccer game for students

The regression analysis of abdominal strength data on the ability to kick the ball of students is the regression coefficient value of 0.38 with a significant level of $0.011 < \alpha < 0.05$, for R square of 0.731. The result indicated 73.1% of the effect of strength of the abdominal muscles. In contrast, the rest ($100\% - 73.1\% = 26.9\%$) is caused by other factors not included in the study. The t-count obtained is -2,677, or abdominal muscle strength has a significant contribution to the ability to kick the ball in elementary school students' football game by 73.1%. Testing the regression model showed an F value of 106,055, with a significant value of $0.011 < \alpha < 0.05$. This means that the ability to kick a ball in a soccer game can be explained significantly by the abdominal strength.

The statistical analysis results are related to the theoretical basis that the strength of the abdominal muscles affects the ability to kick the ball in a soccer game. Meanwhile, power is the ability of a person to use the maximum strength deployed in the shortest possible time. Specifically, in the ability to kick the ball, the strength needed is the integration between the strength and flexibility of the abdominal muscles to trigger the contraction of leg muscles to kick the ball. Abdominal muscles are a center of energy [9].

3.1.3. There was a joint contribution of leg power and abdominal muscle strength to the ability to kick a ball in a soccer game for students at SDN 23 Kanaungan Labakkang, Pangkep Regency.

From the test results of regression analysis of data coordination of explosive leg power and abdominal muscle strength on the ability to kick the ball in the soccer, it obtained a regression coefficient of 0.891 with a significant level of $0.001 < \alpha < 0.05$, for R square of 0.793.

The result means 79.3% of the influence of leg power and joint strength of the abdominal muscles, While the rest (20.7%) is caused by other factors not included in the study. The F-count was obtained 99,657. The significant regression coefficient or leg explosive strength and abdominal muscle strength together significantly contribute to the ability to kick the ball in soccer at 79.3 %.

The statistical analysis also showed a contribution of legs explosive power to the strength of the abdominal muscles. The explosive power (power) is the body's ability to allow a muscle or group of muscles to work explosively. Leg power is also known as explosive power, which is very much needed in various sports. It is one component of physical conditions where muscles' strength and speed are combined in a single pattern of motion. In contrast, muscle strength can develop maximum power in maximum contraction to overcome resistance or load. The advantage is fundamental in supporting sports activities such as soccer, including its ability to shoot at goal.

The physical component is very supportive in kicking the ball, and students can have the ball longer because they have the right physical conditions. Therefore, the physical components of leg power and abdominal muscle strength are considered to have contributed to the ability to kick the ball in a soccer game.

4. CONCLUSION

The physical component of explosive leg power has a significant contribution to kick a ball in a soccer game for students. The abdominal muscle strength also has a considerable contribution to the ability of soccer games. The physical components of leg power and abdominal muscle strength together significantly contribute to the ability to kick the ball in soccer games for students at SDN 23 Kanaungan Labakkang, Pangkep Regency.

REFERENCES

- [1] F. Shahidi, A. G. Mahmoudlu, Y. Kandi, and G. Lotfi, "The effect of two resistance training types on muscle fitness and anaerobic capacity in 16-18 years old male soccer players," *Ann. Biol. Res.*, vol. 3, no. 6, pp. 2713–2717, 2012.
- [2] Y. Negra et al., "Agility in young athletes: is it a different ability from speed and power?," *J. Strength Cond. Res.*, vol. 31, no. 3, pp. 727–735, 2017.
- [3] E. Manolopoulos, C. Papadopoulos, K. Salonikidis, E. Katartzi, and S. Poluha, "Strength training effects on physical conditioning and instep kick kinematics in young amateur soccer players during the preseason," *Percept. Mot. Skills*, vol. 99, no. 2, pp. 701–710, 2004.
- [4] A. Lees and L. Nolan, "The biomechanics of soccer: a review," *J. Sports Sci.*, vol. 16, no. 3, pp. 211–234, 1998.
- [5] F. Perroni, M. Vetrano, A. Rainoldi, L. Guidetti, and C. Baldari, "Relationship among explosive power, body fat, fat-free mass and pubertal development in youth soccer players: A preliminary study," *Sport Sci. Health*, vol. 10, no. 2, pp. 67–73, 2014.
- [6] J. Bangsbo, *Fitness training in soccer: a scientific approach*. Reedswoain Inc., 2004.
- [7] P. Caserotti, P. Aagaard, J. Buttrup Larsen, and L. Puggaard, "Explosive heavy-resistance training in old and very old adults: changes in rapid muscle force, strength, and power," *Scand. J. Med. Sci. Sports*, vol. 18, no. 6, pp. 773–782, 2008.
- [8] G. Tidow, "Aspects of strength training in athletics," *New Stud. Athl.*, vol. 1, pp. 93–110, 1990.
- [9] T. Reilly, *The science of training–soccer: A scientific approach to developing strength, speed, and endurance*. Routledge, 2006.