

Effectiveness of the Ankle Weight Exercise to Increase Football Player's Agility, Speed and Long Passing Power

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Abstract: Football is a very popular sport at this time, where agility, speed, and long passing are the most important components in football. Agility is a person's ability to change direction quickly and precisely without losing balance. Running speed in football serves to support the performance of football players while dribbling into the opponent's area and is used to chase the ball. Agility, speed, long passing is influenced by the strength of the muscles of the lower limbs. Ankle Weight Exercise is weight training on the feet that aims to improve the strength of leg muscle strength performance. The aim is to identify the effect of ankle weight exercise to increase football player's agility, speed, and long passing power. Research design is one group pre-test post-test design. The population in this study were football players. A total of 34 respondents met with the inclusion criteria. This research was conducted three times a week for six weeks. Measurements using the Illinois agility run test, 100 meters sprint test, and long pass test. The results of the study using the Wilcoxon test were set to 0.00 ($p < 0.05$) for each variable. Ankle weight exercises effective in increasing the football player's agility, speed, and long passing power.

1 INTRODUCTION

Several kinds of basic techniques needed in football, such as: stop the ball, shooting, dribbling, and passing (Aquino et al., 2016; Surohudin, 2013). There are important components in the game of football such as endurance, speed, strength, reaction, and agility (Sheppard & Young, 2007).

Agility is an ability to change direction with speed and on time to move without losing balance. An agile player is a player who moves without losing balance and awareness of his body position. Agility can occur because of the movement of explosive energy, and the strength of muscle contraction determines the amount of energy and muscle speed depends on the strength of muscle contraction. So that muscle contraction will depend on the adhesive power of muscle fibers and the speed of nerve impulse transmission (Mappaompo, 2011)

Running speed is important to be used to support the performance of football players when dribbling into the opponent's area or to catch the ball. Running

speed can be developed through basic components of motion (body control), strength (muscle strength), power (muscle power), coordination, muscle endurance (Widodo, 2010). Slow running speed can affect the athlete's performance. The running speed of an athlete is influenced by the length of steps and the frequency of running steps (Sidik & Giriwijoyo, 2014). The reason for the slow running speed is due to the wrong training program, and athletes usually train when there will be only a football match.

A weak long passing kick affects an athlete's achievement, and an athlete's long passing kick is influenced by the strength of the muscle mass (Sidik & Giriwijoyo, 2014). The cause of the long passing kick is weak due to the wrong training program and athletes usually practice intensively when there will be a football match alone

Weight training is a type of exercise that is commonly used to develop strengths using gravity (Riyadi, 2008). This form of exercise causes the body's muscles to contract using bodyweight or other devices to stimulate muscle growth or work, strength, and endurance by targeting certain muscle groups and types of movements. There are several methods of

weight training to improve the ability of endurance muscles, one of the methods used is the ankle weight exercise method impacts of the poor agility of football players (Riyadi, 2008).

2 METHOD

This research is a quasi-experimental with pretest and posttest approach design to compare the results of the pretest and posttest to determine the effect of giving ankle weight with a load of 1.5 kg, 2.25 kg, and three kg for six weeks with treatment three times a week. The number of respondents was 30 people who fit the inclusion criteria.

Respondents were measured agility using Illinois agility run tests using a 10 x 5-meter field area and using eight cones on the sides of the field, respondents measured their running speed using a 100-meter sprint test, and respondents measured their long passes using a long passing test. Analysis of the data used to test the hypothesis in this study is to use the Shapiro Wilk test and then proceed with the Wilcoxon test. This research was conducted in December 2018 until February 2019.

3 RESULT AND DISCUSSION

Data analysis from 30 respondents obtained the mean before intervention is 20.15 and after intervention changed to 17.59. Results of the Wilcoxon test concluded sig 2 tailed value of p-value 0,000 <0.05, which is the effect of giving ankle weight exercise to increase agility in football players (see Table 1).

The running speed category before the intervention is 11 respondents, and at least in the good category is four respondents. The running speed category after the interventions is ten respondents, and at least in less category is one respondent. Wilcoxon test results obtained an increase in running speed before and after the intervention of ankle weight exercise had a significant difference. Of the 30 respondents, there was a mean value before the intervention that was 19.77 and after the intervention was given a mean value of 18.18. The difference from Wilcoxon test results after being given intervention can be p-value 0.00 <0.05, i.e., there is an effect of giving ankle weight exercise to increase running speed in football players (see Table.2)

The long pass category before the intervention in enough category was 27 respondents, and at least in the good category was three respondents. The long

pass category after the intervention in a good category was 19 respondents, and at least in the very good category were two respondents. The Wilcoxon test results obtained an increase in long passing before and after the intervention of ankle weight exercise. There was a mean value before the intervention, which was 29.08 and after the intervention was given mean value of 33.50. The Wilcoxon test results in the sig 2 tailed value obtained 0,000 <0.05, i.e., there is the effect of giving ankle weight exercise to increase long passing in football players (see Table 3).

Table 1. Results of the Wilcoxon test effect of ankle weight exercise on increasing agility in football players

		Mean	N	Sig.
Ankle Weight	Pre-test	20,15	30	0,000<0,05
Ankle Weight	Post-test	17,59	30	0,000<0,05

Table 2. Results of the Wilcoxon test effect of ankle weight exercise on increasing speed in football players

		Mean	N	Sig.
Ankle Weight	Pre-test	19,77	30	0,000<0,05
Ankle Weight	Post-test	18,18	30	0,000<0,05

Table 3. Results of the Wilcoxon test effect of ankle weight exercise on increasing long passing in football players

		Mean	N	Sig.
Ankle Weight	Pre-test	29,08	30	0,000<0,05
Ankle Weight	Post-test	33,50	30	0,000<0,05

Exercise will make the body experience a physiological response. Exercise will cause the neuromuscular, hormonal, cardiovascular, respiratory, and metabolic systems in the body. The hormonal system has an increase in the hormone adrenaline (the process of liver glycogenesis, secretion of cortisol by adrenals, increased contraction of the heart muscle and striated muscle), glucagon hormone (breaking down fat deposits into the bloodstream and preventing blood sugar from falling). In the cardiovascular system and increase in atrial and ventricular volume, the number of capillaries increases and the amount of Hb increases. In the

respiratory system increase in tidal volume, vital lung capacity, and diffusion ability (Sebastianus, 2011)

When a soccer player runs dribbling, the leg muscles must be able to withstand the weight of the body and protect the ball from the opponent's interference. Systematic training is training that is repeated and planned carefully and carried out according to the schedule applied. Athletes' muscle strength and agility can be increase using weight training. Various opinions say that leg muscle strength to running speed is one of the physical components used when playing football, especially in dribbling (Patraserasah, 2017).

Ankle weight can increase agility in football players. Weight training in the ankle weight is one of the methods to improve physical condition, and the muscles will contract and become stronger. Neurotransmitters release acetylcholine and then delivered to the muscle membrane and stimulate the sarcoplasmic reticulum to release calcium and then binds troponin, causing ductal actin and myosin to pull, resulting in muscle contraction. Weight training will be added with the aim that muscle strength will be more effective if given a slight load above its ability, it aims to adapt the functional body so that there is an increase in muscle strength and indirectly power and flexibility will also increase, where power and flexibility are combined in agility (Hudriah, 2018)

One of the supporting factors to Dribbling is leg muscle strength when players run by dribbling, and leg muscles can hold the load and balance the body for better movement (Lutan, 2006). Ankle weight exercise is used to increase the strength of leg muscles. Weight training with ankle weight exercise is included in isotonic movements because, during contractions, there is a constant tension with changes in muscle length (Riyadi, 2008). Isotonic movements contract with the same tension or weight constantly with changes in muscle length (Sidik & Giriwijoyo, 2014)

Weight training causes muscles to become hypertrophy, thereby increasing volume in each muscle fiber, increasing the number of blood vessels in muscle fibers and cell organelles in muscles (Kalangi, 2014; Sidik & Giriwijoyo, 2014). This enlargement occurs because of the increase in contractile elements in the fibers, causing increased strength of muscle contraction or active strength of muscles, thickened sarcolemma, increased connective tissue between muscle fibers, which can increase muscle strength and increase running speed (Sidik & Giriwijoyo, 2014). The hypertrophy in the muscles causes the formation of new muscle fibers, and mitochondria have increased (Colson & Collison,

1983). Mitochondria play a role in the formation of ATP for the action of actin and myosin faster, so that muscle contraction is faster. Mitochondria also play a role in providing energy for the process of muscle contraction and increased muscular endurance (Birch K., McLaren D., 2005; Guyton & Hall, 2006)

This ankle weight exercise causes hypertrophy in muscle cells, which can increase muscle strength and power. Running speed has elements of good muscular strength and leg power. This ankle weight exercise uses the De Lorme method with a load of 10 RM with eight sets (Lesmana, 2005)

Long passing to be effective in their movements because one of the supporting factors is leg muscle strength when the player passes the ball the leg muscles can hold the load and balance the fulcrum of the body to be more precise when kicking the ball over long distances (Lutan, 2006). Ankle weight exercise is used to increase leg muscle strength used for running, namely m. Quadriceps femoris, m. Gluteus maximus, m. Iliopsoas, m. Hamstring, m. Triceps surae.

The research of Radjiku et al. (2013) is a relevant study to this research, and there is the effect of ankle weight training on increasing the power of long passing kicks in the soccer game of male students in class VII.

4 CONCLUSION

Ankle weight exercise effective to increase football player's agility, speed, and long passing power

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