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Parachute resistance training: A method to improve the running speed of football players

Ketut Chandra Adinata Kusuma*, I Kadek Happy Kardiawan, I Made Satyawan

Universitas Pendidikan Ganesha, Indonesia

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ABSTRACT

The problem raised is the absence of data on the implementation of resistance parachute-assisted training methods that can increase the short running speed of amateur football players. This study aims to determine the effect of parachute resistance assisted training methods on running speed. This type of research is quantitative with a quasi-experimental research method with the modified pre-test-post-test group design. The subjects of this study are 10 male amateur football players aged 18-20 years. The test instrument in this study is to measure the running speed using the 30 meters sprint test. Data are analyzed using t-test paired sample t-test at a significance level of 5%. The results of data analysis show that the parachute resistance assisted training method has an effect on running speed (sig value = 0.000). Thus, the parachute resistance assisted training method is suitable to be applied to increase the running speed of amateur football players. This research can be further developed by increasing the number of samples and applied to professional football players.

Keywords: Parachute resistance training; speed; football

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Corresponding author: Ketut Chandra Adinata Kusuma, Physical Education Health and Recreation, Universitas Pendidikan Ganesha, Buleleng, Bali, Indonesia
Email: chandra.adinata@undiksha.ac.id

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INTRODUCTION

Various elements of society in Indonesia make football as a medium to improve the quality of health, fitness and seek the highest achievement. There are those who are members of football schools or football academies, amateur and professional clubs. In today's modern football era, running speed is an important factor in winning a game. Until now, the England League is still the barometer of football with a fast game compared to leagues in other countries (Sarmento, Pereira, Matos, Campanico, Anguera, & Leitao, 2013). Speed is one of the basic biomotor components needed in each sport (Sukadiyanto, 2011). Speed is defined as the ability to travel a certain distance quickly (Bompa & Buzzichelli, 2019). Thus, the physical condition, especially speed becomes important that every player must have.

The implication of this is that the techniques, tactics and strategies are optimally carried out by each player. So in the context of a football match, both when attacking and defending, the player will do a short sprint, accelerate up to a maximum sprinting speed (Haugen, Tonnessen, Hisdal, & Seiler, 2013). Every player is required to run faster than his opponent to win the ball (Lockie, Murphy, Callaghan, & Jeffriess, 2014). For example during a defensive moment, players will take actions such as pressing, marking,

covering, squeezing space, blocking or during attacking moments such as running with the ball and running into space (Danurwindo, Putera, & Sidik, 2017).

Even though the length of the football field reaches 100-110 meters, the players will not run as far as it. A data states that at the farthest, football players will run fast, reaching only 10 or 20 (Iswandiari, 2018). This is due to soccer players will not do dribbling at high speeds until they reach a distance of 100 meters or even more. So that the speed character of football players is different from ordinary sprinters. Thus, speed has become increasingly important in modern football (Haugen et al., 2013). Based on observations of 77 players from the elite soccer academy in Helsinki totaling 186 matches in the U-13 to U-18 age group, it turns out that the winger and striker positions display very high sprint activity compared to other positions (Buchheit, Mendez-Villanueva, Simpson, & Bourdon, 2010). The data is obtained using the Global Positioning System / GPS tool used by each player. So that several positions, such as wing back, wing, and striker, are required to have more speed than players in other positions.

One of the effective training methods to increase running speed while improving other physical conditions to athlete's performance is resistance training. Resistance training is also included in weight training, because it uses resistance for the method used. Weight training is an exercise that is done to increase strength and muscle mass, but weight training is different from lifting weights and body building because weight training emphasizes the exercise program and health itself and is not a sport (Kardiawan & Kusuma, 2014). So, if it is done correctly it can develop speed, muscle strength, and muscle endurance, power, increase in the bone strength index (Myers, Beam, & Fakhoury, 2017). Thus, it can also be said that weight training is systematic training in which weights are used as a tool to increase muscle strength in order to achieve the desired goal. The benefits of resistance training include improving physical appearance, movement control, walking speed, functional independence, cognitive abilities and self-esteem (Westcott, 2012).

Resistance training method that uses external equipment to hold back during sprinting, one of which is using a parachute. This method become known as parachute resistance training. One of the advantages of this method is that the trainer can train the sprint running technique with adjusted weights at the same time so that it can increase the time for foot contact with the ground (Paulson & Braun, 2011). The urgency above makes the writer hope that football coaches in Indonesia will recognize and be able to apply the parachute resistance training method. So that the running speed needed by football players can be increased.

Thus, the purpose of this study is to reveal and examine the effect of the parachute resistance training method on the running speed of amateur football players in the under 20 years age group (U-20). Although this method has been widely used in order to increase speed, such as in a group of competitive male swimmers (L'Uboš, Yvetta, Jana, Mája, Matúš, & Krč, 2018), against 8 (eight) sprinter (Martinopoulou, Argeitaki, Paradisis, Katsikas, & Smirniotou, 2011), as well as on female football players (Upton, 2011), however, until now no data has been found about the effect of this method with parachutes as a tool for running speed over a short distance of 30 meters and is intended for amateur football players.

METHODS

This study uses a quasi-experimental research method with the modified pre-test-post-test group design (Kanca, 2010). The subjects of this study are football players Intan Jaya, Celukanbawang, Buleleng Regency who are still amateur but have experience training twice a week and have no history of injury to the leg muscles. The number of subjects is 10 males with an age range of 18 to 20 years. The research subjects underwent exercise for 4 (four weeks) with a frequency of 12 (twelve) meetings / exercises using the resistance parachute. The training intensity increases in the first week 80% DNM until the fourth week reaches 95% DNM which characterizes that the training intensity zone must be in the maximum zone (Bompa & Buzzichelli, 2019). The intensity in the maximum zone is a guideline in training a running speed of 10-30 meters or acceleration.

Table 1. Program of Taining Week 1 – Week 2

No	Name	Set	Repetition	DNM	80-85% DNM
1	WA	4	4	200	160-170
2	KA	4	4	200	160-170
3	ASP	4	4	200	160-170
4	S	4	4	202	162-172
5	RF	4	4	202	162-172
6	SW	4	4	202	162-172
7	IH	4	4	200	160-170
8	DFF	4	4	202	162-172
9	MR	4	4	200	160-170
10	AF	4	4	202	162-172

(Bompa & Carrera, 2015)

Table 2. Program of Training Week 3 – Week 4

No	Name	Set	Repetition	DNM	90-95% DNM
1	WA	3	5	200	180-190
2	KA	3	5	200	180-190
3	ASP	3	5	200	180-190
4	S	3	5	202	182-192
5	RF	3	5	202	182-192
6	SW	3	5	202	182-192
7	IH	3	5	200	180-190
8	DFJ	3	5	202	182-192
9	MR	3	5	200	180-190
10	AF	3	5	202	182-192

(Bompa & Carrera, 2015) *Note:* DNM; Denyut Nadi Maksimal

In this study, the data used are primary data. Data collection is carried out twice, namely pre and post test using an instrument of 30 meters sprint test based on smart speed (Mahardika, 2010). The pre test, practice and post test are carried out at the soccer field in Celukanbawang Village, Gerokgak District, Buleleng Regency. Furthermore, the data obtained are analyzed using the t-test assisted by the SPSS 16 program.

RESULT AND DISCUSSION

The normality test of the data distribution is carried out to ensure that the research subjects are normally distributed. To determine the normality of data distribution, the Kolmogorov-Smirnov formula is used at the 0.05 significance level. Based on the analysis that has been carried out using SPSS 16.00 for Windows, the results are as shown in Table 3.

Table 3. Test of Data Normality

	Kolmogorov-Smirnov		
Group	Statistic	Df	Sig.
Resistance Parachute	.182	10	.200*

Based on table 3 above, it can be seen that the data distribution is normally distributed. Furthermore, hypothesis testing. The hypothesis is accepted if the Paired t-test value has a significance value smaller than α (sig <0.05). Meanwhile, if the calculated significance value is greater than α (sig> 0.05), then the hypothesis is rejected.

Table 4. Test of Paired T-test Resistance Parachute Assisted Training Method toward Running Speed

	Paired differences		
	t	df	Sig.(2-tailed)
Pre Test – Post Test	6.839	9	.000

If you look at table 4 above, the significance value of the training method assisted by resistance parachute to running speed is 0.000 where the sig (0.000) <α (0.05) so that the hypothesis is accepted. Thus, the parachute resistance training method can increase the running speed of amateur football players. So that the novelty obtained from these results, namely practicing using this resistance parachute, can increase running speed, especially at a distance of 30 meters in accordance with the characteristics of playing football which requires more short speed or acceleration. These results also answer previous findings that show that resisted sprint training can increase the running speed of professional football players at distances of 5 meters, 10 meters, 15 meters, 20 meters, and 25 meters (Gil, Barroso, do Carmo, Loturco, Kobal, & Tricoli, 2018). This method is also safe for athletes who are in the youth category, namely under 20 years of age. This is confirmed by the results of research that resistance training can improve performance, improve health, improve body shape, prevent sports injuries in youth athletes (Lloyd, Faigenbaum, Myer, Stone, Oliver, Jeffreys, & Pierce, 2012). Apart from technical skills and team tactics, every football player must develop and maintain aerobic and anaerobic conditions at the highest level, speed, agility, strength and power through interval training, small side games, repeated sprints, gym training (Turner & Stewart, 2014).

The use of this prisoner parachute increases speed but does not affect the user's technical quality. This increase in speed is caused by the resistance / resistance provided by the parachute which is right behind the center of the user's body (Telles, Barroso, Barbosa, Salgueiro, Colantonio, & Junior, 2015). In accordance with the results of previous research which states that the parachute resistance training method has the potential to increase muscle strength by overloading the body without sacrificing running kinematics and increasing shoulder flexion (Paulson & Braun, 2011). So, when practicing using this parachute in addition to increasing endurance, it will not change the running technique of the athlete himself. The effectiveness of practicing is increasingly tested because only using one tool can train the physical components and does not change the technique or running kinematics.

Each sport has characteristics in running speed, including football where players rarely run in a straight line like track runners (Bompa & Carrera, 2015). During playing, football players do more acceleration starting from running at a slower speed or when the player takes a breakaway (Bompa & Buzzichelli, 2019). As explained above, football players sprint no more than 20 meters (Iswandiari, 2018). The same thing was also revealed that during the game of football, it turns out that players sprint on average around 17 meters and range from 5 to 50 or 60 meters (Bompa & Buzzichelli, 2019). So it can be said that the ability of short speed and acceleration is needed by football players, regardless of their playing position. So that using the parachute-assisted resistance training method becomes more effective with the characteristics of the sport of football.

The effectiveness of training methods has been tested when dealing with the characteristics of each sport. Besides being effective in improving your jumping ability, weight training or resistance training can also improve the running ability of U-19 elite soccer players (de Hoyo, Gonzalo-Skok, Sañudo, Carrascal, Plaza-Armas, Camacho-Candil, & Otero-Esquina, 2016). These results are in accordance with the results of previous research by Upton (2011) which compared two training methods, namely the resistance sprinting method and assistance sprint to the running speed and acceleration of the IA division female soccer players. The results show that running training using the resistance sprinting method and assistance sprint both have a significant effect on running speed at a distance of 40 yards (36.6 meters). However, if you want to increase acceleration at a distance of 5-15 yards (4.6 meters - 13.7 meters), it is recommended to use the assistance sprint training method. If you want to increase acceleration at a distance of 15-25 yards (13.7 meters - 22.9 meters) and 25-40 yards (22.9 meters - 36.6 meters) then use the resistence sprinting method. Acceleration can be increased when it is proven that there are distances of 10 and 30 meters (West, Cunningham, Bracken, Bevan, Crewther, Cook, & Kilduff, 2013). Thus, it is very relevant if the resistance sprinting method is applied to increase running speed and acceleration which is clearly needed in the characteristics of the game of football.

The increase in the physical abilities of young elite tennis players also occurred as a result of practicing using the resisted sprint training method (Moya-Ramon, Nakamura, Teixeira, Granacher, Santos-Rosa, Sanz-Rivas, & Fernandez-Fernandez, 2020). After undergoing a 6-week training program, physical abilities

such as acceleration, running speed changed direction / agility, leg muscle power of the resistant sprint group whose loading using a weighted vest and also cords elastic was better than the group trained using conventional methods. Resisted sprint training programs with large size parachutes also have a significant effect on the speed and acceleration of sprint athletes (Martinopoulou et al., 2011). Parachutes, which in this case become a load / resistance in the training method, have the effect of increasing the speed of the perpetrator, including power can also be increased (L'Uboš et al., 2018). Running speed and leg power also have a significant impact if the methods mentioned above are practiced (Sakti & Irmansyah, 2016).

CONCLUSION

Based on the results and discussion above, the parachute resistance training method is effective for amateur football players to increase their running speed, especially running a distance of 30 meters or a short speed. However, in this study researchers still use a small number of subjects. Referring to this, it is recommended that football coaches who want to increase the running speed of their players can use this training method, as well as further researchers to increase the number of their research samples and replace the samples with professional football players.

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