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The Effect of Speed Play and Fartlek Training Methods on Increasing Vo2max of Labschool UPI High School Futsal Players

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ABSTRACT

This study aims to determine the effect of speed play and fartlek training methods on increasing VO2Max of Labschool UPI high school futsal players. The method used in this research is an experiment with two group pretest-posttes design. The sampling technique in this study used total sampling technique. The samples in this study were Labschool UPI high school students who participated in extracurricular futsal, totaling 14 students. The instrument in this study used the bleep test to measure aerobic endurance (VO2Max). Data analysis used Shapiro-Wilk test, Levene Statistics, Paired Sample T-Test, and Independent Sample T-Test with the help of SPSS 25 application. Based on data processing and analysis, it can be found that: 1) speed play training method has a significant effect on increasing VO2Max of Labschool UPI high school futsal players, 2) The fartlek training method has a significant effect on increasing VO2Max of UPI Labschool High School futsal players, and 3) There is a significant difference in influence between the speed play training method and the fartlek training method. Where the fartlek training method has a greater influence and is quite effective on increasing VO2Max of UPI Labschool high school futsal players.

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1. INTRODUCTION

Futsal is one of the most popular sports among the general public. The popularity of futsal is not only known as a competitive sport, but also often as a health or recreational sport. Futsal is a means to develop the talents of soccer players because players can master game techniques, such as dribbling, kicking, heading, passing, holding, and attacking. Futsal is played on a field with a length of 25-42 meters x a width of 15-25 meters, the number of players is five people with one goalkeeper on each team, playing time is 2 x 20 minutes with unlimited substitutions. According to Bangsbo (2003) Futsal is a fast and dynamic game that requires players to move quickly on a relatively small field. The development of Futsal in Indonesia is quite advanced. This is evidenced by the large number of enthusiasts for this sport, both men and women. So that futsal has become a fairly prestigious competitive sport with many competitions. The goal of competitive sports is to achieve high achievements for an athlete in the sport they are involved in. SMA Labschool UPI is one of the schools that conducts sports activities for education and achievement in order to improve students' physical fitness and develop students' talents and interests in extracurricular sports branches in the school, especially futsal. Futsal is a sport that requires its players to have very good physical condition (Naser et al., 2017). Physical condition is basically one of the most important requirements in every effort to achieve an athlete's achievement, because physical condition is one of the most dominant components in achieving sports achievements. Including in futsal.

Physical condition is a complete unity of components that cannot be separated, both in terms of improvement and maintenance (Nugroho et al., 2021). Physical condition must be planned well and systematically and is intended to improve physical fitness and functional abilities of the body's system so that athletes can achieve achievements. In physical condition, athletes must have good physical abilities in carrying out training and matches which are very important for the athlete, because an athlete must be able to maintain his body if he wants to have good physical condition because maintaining health and fitness is also very important for an athlete. According to Suhartoyo (2019), a person can be categorized as fit if he can carry out physical activities without experiencing excessive fatigue.

Good physical condition will support the performance displayed by futsal players on the field (Barbieri et al., 2016; Ribeiro et al., 2020; Spyrou et al., 2020). No matter how great and good the player's technique and tactics are without being based on good physical condition, sports achievements will not be achieved optimally. In the sport of futsal, the intensity of movement will be very high during the match, so it must have components of good physical condition. According to Irawan (2019) "There are several elements presented in futsal such as endurance, speed, strength, flexibility, agility, and explosive power. Efforts to achieve prime physical condition require a method or method which is a well-structured training program". Efforts to improve the physical condition of an athlete must pay more attention to the physical condition of an athlete (Bonci et al., 2008; Oward et al., 2009). The aspect of physical condition is the most important part of all sports, especially futsal, there are aspects of training such as physical, technical, tactical, and mental. In improving physical abilities, it is also necessary to improve the components of physical condition. Hidayat (2014) said that "All components must be developed and adjusted to the needs of athletes as physical condition components include endurance, stamina, flexibility, agility, strength, power, muscle endurance, speed, reaction speed and coordination".

Endurance is a basic element of physical fitness in improving physical condition. Good endurance training is done after experiencing significant fatigue. According to Argasasmita (2007) "Endurance is the ability to carry out sports activities or activities for a long period of

time without significant fatigue". One of the factors causing futsal athletes to not achieve is their low endurance ability. By increasing their endurance ability, athletes will get maximum achievement, an example of increasing endurance is aerobic endurance or what can be called VO2Max.

Futsal matches that have high mobility and last a long time, namely 2 x 15 minutes, require high VO2Max. The problem that we often see in training to increase VO2Max is the boredom and saturation of players during the training process. This is because VO2Max training has a long duration. In addition, the activities carried out are very monotonous. Prakoso (2017) explains that The lack of diversity in training methods is only in the form of long-distance running to train the physical that is applied so that training becomes boring and less effective for improving students' abilities, fatigue in physical training and training programs that are not yet appropriate, are thought to be triggers for not achieving training goals so that the right training method is needed to increase VO2Max capacity.

The role of VO2Max is very important in futsal matches. If the player's VO2Max is not at a good level, it will interfere with the player's performance in the match. Training to increase VO2Max usually takes place over a long duration. The advantage of this modification is that it can reduce player boredom and boredom in undergoing the training process. Therefore, it is certain that futsal players must be able to maintain aerobic endurance (VO2Max) for a long time even though fatigue has occurred. When futsal players have good aerobic endurance (VO2Max), it will support physical performance during the game.

VO2Max is one of the parameters for the physical component of endurance. The level of VO2Max will determine the level of a person's endurance ability. Rahmad (2016) said that VO2Max describes the level of effectiveness of the body in obtaining oxygen, then sending it to the muscles and other cells and using it in energy procurement, where at the same time the body removes metabolic waste that can inhibit physical activity. To increase endurance ability, there are many types such as long-distance running with a fixed rhythm, long-distance running with a changing rhythm, cross country, intervals, fartlek, speed play, tempo running, and many other training methods to increase endurance. The training methods that researchers use to influence the ability of sports activities in the long term and can also increase aerobic endurance ability (VO2Max) are the speed play training method and the fartlek training method.

The speed play method was created by Gusta Holmer from Sweden. The definition of speed play is a form of training done by running long distances such as a combination of varied sprints with slow runs, for example this training can start from sprinting at short distances intensively then continued with short jogging. According to Birch (2005) "Speed play combines aerobic demands with continuous movement and interval speed, the speed play method is a very enjoyable training and aims to increase the strength and aerobic capacity of athletes". speed play and fartlek have the same goal, namely to increase strength and aerobic capacity, by including faster segments and changing running speeds by playing around with speed the body will adapt to different speeds. The fartlek training method is a combination of interval training and continuous training, and fartlek training is also an endurance system to build, develop, or maintain an athlete's body condition. Gusta Holmer introduced fartlek to bring a new atmosphere that is usually repeated training with hard work and full of boredom, into a fun training because it is done by playing around with speed. Eleckuvan (2014) stated that "Fartlek allows the athlete to run whatever distance and speed they wish, varying the intensity, and occasionally running at high intensity levels and this type of training stresses both the aerobic and anaerobic energy pathways". Fartlek training should be done in the field. In this training system, athletes can determine the type, intensity of training and duration of training or activity depending on the circumstances and conditions at that time. In essence, fartlek is the same as continuous training, but athletes are free to intersperse their running with sprints (fast running), therefore fartlek can be considered an "introduction" to more intensive work. According to Lutan (2001: p. 57) "Fartlek training has a very good effect on the development of technical skills, strength, and endurance of athletes". Fartlek training is based on changes in training sessions, namely variations in slow, medium, and fast phases. So the fartlek method can be used as training to increase aerobic endurance. Especially in futsal sports whose movements are fast and sometimes slow, but for a long time. By playing with speed, fartlek training aims to increase strength and aerobic endurance capacity and can strengthen the respiratory muscles. The speed play and fartlek training methods are one form of training used to increase VO2max.

Every cell in the human body needs oxygen to convert food into ATP (adenosine triphosphate), so that each cell is ready to do its job, while the cells that use the least oxygen are resting muscles. According to Bafirman (2013) "VO2Max is the maximum aerobic capacity usually expressed as Maximal oxygen uptake (VO2Max)". VO2Max can be measured as the amount of oxygen in liters per minute (I / min) or the amount of oxygen in millimeters per body weight in kilograms per minute (ml / kg / min). According to Bompa & Haff (2009) "Aerobic power is measured as the highest level at which oxygen can be taken up and used by the body during maximal exercise and can also be defined as maximal oxygen uptake (VO2max)". The higher the VO2Max, the better the athlete's endurance stamina.

2. METHODS

The method used in this study is the experimental method, which aims to determine the effect of a particular treatment on the observed variables. This approach is in accordance with the characteristics of experiments that try to explain the causal relationship between independent variables and dependent variables. Experimental research is included in the quantitative research category because it produces data in the form of numbers that can be analyzed statistically. In this context, the researcher wants to know how much influence the two different training methods, namely speed play and fartlek, have on increasing VO2Max in extracurricular futsal students. As explained by Arikunto (2006), the experimental method allows researchers to control confounding variables and focus on the treatment given to see the changes that occur.

The design used in this study is the Two Group Pretest-Posttest Design, namely two different groups are given different treatments after the initial measurement (pretest) and before the final measurement (posttest). The first group was given treatment with the speed play training method, while the second group with the fartlek method. This design was chosen to compare the effectiveness of the two types of training on increasing VO2Max. The group division process was carried out in a balanced manner using the matched-pair method so that the research results were more valid. The instrument used is the Multistage Fitness Test (bleep test) to measure the participants' VO2Max ability before and after treatment. The results of the pretest and posttest will be analyzed using descriptive statistical techniques and hypothesis testing through the SPSS 25 program.

Table 1. Descriptive Calculation Analysis							
Group	<i>Pretest</i> x ± sd	Min	Max	Posttest x ± sd	Min	Max	Ν
Speed Play	28,9±2,41	25,9	32,3	29,2±2,39	26,1	32,6	7
Fartlek	28,7±2,43	25,4	31,9	29,1±2,39	25,9	32,1	,

3. RESULTS AND DISCUSSION Results

Table 1 explains the summary of pretest and posttest data on increasing VO2Max in futsal players in the speed play and fartlek groups. In the speed play group, the pretest results obtained were the mean and standard deviation measurements of (\bar{x} = 28.9 and sd = 2.41) and the posttest was (\bar{x} = 29.2 and sd = 2.39). While in the fartlek group, the pretest results obtained were the mean and standard deviation measurements of (\bar{x} = 28.7 and sd = 2.43) and the posttest was (\bar{x} = 29.1 and sd = 2.39).

Table 2. Shapiro-Wilk Normality Test Results							
Group	Data		1f				
			Statistic	Ν	Sig.	Information	
Speed Play	Pre-Test	0,940	7		0,635	Normal	
Speeu Pluy	Post-Test	0,939			0,631	Normal	
Fartlak	Pre-Test	0,947	/		0,703	Normal	
Fullek	Post-Test	0,928			0,535	Normal	

From Table 2, the results of the normality test using the Shapiro-Wilk test show that the pretest and posttest data testing variables increase VO2Max using the bleep test in the Speed play and fartlek groups with a value (sig> 0.05). So it can be concluded that the pretest and posttest bleep test data in this study are normally distributed and can be analyzed using parametric tests.

			-	-	
Variabal	Data	Levene Statistic			Information
Variabei	Dala	Stat.	Sig.	Ν	information
Bleep Test	Speed Play	0,006	0,941	7	Homogen
	Fartlek	0,018	0,896	/	Homogen

Table 3. Results of Levene Statistic Homogeneity Test

Based on the data in Table 3, it can be seen that the results of the homogeneity test of the pretest and posttest bleep test in the speed play and fartlek groups with a value of (sig> 0.05). So it can be said that the variables come from the same variance (homogeneous).

Table 4 Results of Independent Sample T-Test						
Variabel	Kelompok	Mean	Beda	t-hitung	Sig.	
Bleep Test	Speed Play	0,295	0,066	5,164	0.000	
	Fartlek	0,361			0,000	

Based on Table 4 regarding the results of the Independent Sample T-Test on measuring the increase in VO2Max using the bleep test between before and after applying the speed play training method and the fartlek training method with a sig value of 0.000 <0.05, it can be concluded that there is a significant difference in the influence between the speed play training method and the fartlek training method on increasing VO2Max in SMA Labschool UPI futsal players, and therefore the accepted hypothesis is HO or there is a difference in the influence of increasing VO2Max using the bleep test between before and after applying the speed play training method and the fartlek training the bleep test between before and after applying the speed play training method and the fartlek training the bleep test between before and after applying the speed play training method and the fartlek training method of SMA Labschool UPI futsal players.

Discussion

The results of this study indicate that through the speed play training method and the fartlek training method can provide a significant effect on increasing VO2Max, this is proven through hypothesis testing through the Independent Sample T-Test which indicates that the sig. .000 < .05 means that both training methods have a significant impact on increasing VO2Max, but what distinguishes the two training methods is the level of significance on increasing VO2Max. It can be seen in Figure 4.1 explaining that the results of the speed play pretest were 28.95% and the posttest was 29.25% with a difference of .30%. So, it can be ascertained that by using the training method there is an increase in speed play of .3%, and in Figure 4.2 it explains that the results of the fartlek pretest were 28.75% and the posttest was 29.15% with a difference of .36%. So, it can be ascertained that by using the training method there is an increase in fartlek of .36%. So, from the results of the difference between the two groups of data, the better increase is in the data of the fartlek training method group by .36%.

Through the speed play training method, it has a significant impact on building, restoring, and maintaining a person's body condition and the fartlek training method has a very good effect on the development of technical skills, strength, endurance and mental fitness. What distinguishes the two training methods is that speed play only does repeated running between fast and slow running so that it causes boredom, while the fartlek training method is carried out where there are hills, holes, ditches to jump over, sandy soil, grassy soil and, so that there is no boredom that occurs when doing the training method.

This study uses an experimental research method with a Two Group Pretest - Posttest Design type. The speed play training method and the fartlek training method are carried out step-by-step which begins with an introduction to the training program starting from the volume and intensity norms of a training program. So that through the speed play and fartlek training methods, students can understand their training program so that the training program runs according to plan. This has an impact on the situation and conditions of the training program which tends to be monotonous and boring, so that it does not stimulate students' interest in training. Meanwhile, the fartlek training method has a significant effect on increasing VO2Max with a sig value of .00 < .05. The fartlek training method is not only about aerobic endurance and speed in running but includes understanding the patterns in running techniques in fartlek so that it allows students to learn a lot.

Thus, it can be concluded that the speed play and fartlek training methods have an impact on increasing VO2Max. However, on the other hand, it has a significant comparison, where the fartlek training method has a greater influence than the speed play training method in the process of increasing VO2Max, then the fartlek training method has quite effective results for use in increasing VO2Max compared to the less effective speed play training method, this can be seen from its treatment, where the fartlek training method the psychological factors of students are not disturbed because when carrying out the training

program the students' running range is wide and influenced by the surrounding scenery, while the speed play training method carries out a fairly long training program and is only carried out on the futsal field so that students feel bored and in the end the students' psychology becomes less good so that the training program is not carried out well.

5. CONCLUSION

Based on the results of data analysis and research findings that have been conducted, it can be concluded that the speed play training method has an effect on increasing the VO2Max of SMA Labschool UPI futsal players. The fartlek training method has an effect on increasing the VO2Max of SMA Labschool UPI futsal players. There is a significant difference in influence between the speed play training method and the fartlek training method, where the fartlek training method has a greater and quite effective effect on increasing the VO2Max of SMA Labschool UPI futsal players.

6. AUTHORS' NOTE

This article has no conflict of interest.

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