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The Effect of Small Sided Games and Dynamic Passing Training on Improving Cognitive Intelligence and Vo2max Ability of Football Players

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ABSTRACT: The game of soccer is a team game played by two teams where each team has 11 players, with the aim of scoring as many goals as possible. This study used small sided games and dynamic passing training methods, aiming to determine the effect of small sided games and Dynamic Passing training on improving cognitive intelligence and VO2Max ability of soccer players. This research is a quasi-experimental research, with a research design of two groups pretest and posttest design. The sample in this study amounted to 19 children. The data analysis technique uses a t-test with a significance value of <0.05 assisted by the SPSS application version 25. Based on the results of digit span test data analysis, the treatment group received a sig value. 0.361 and a control group of SIG. 0.375, due to differences in respondent characteristics, background cognitive abilities and the small number of respondents. Meanwhile, from the results of VO2Max data analysis, the treatment group obtained sig values. 0.005 and a control group of SIG. 0.045, because in the preparation of its exercise program it has applied important factors in increasing endurance. Then the results of the independent sample t-test t-test digit span test get a sig. 0.157 and VO2Max test results get sig. 0.333. The conclusion in this study is (1). There was no significant effect of small sided games and dynamic passing on cognitive intelligence. (2). There is a significant effect of small sided games and dynamic passing exercises on Vo2Max Ability. (3). There was no significant difference in the effect of small sided games and dynamic passing on cognitive intelligence and Vo2Max ability.

KEYWORDS: Cognitive, VO2Max, Small Sided Games, Passing

I. INTRODUCTION

Sports are all systematic activities and aim to foster, encourage, and increase physical, mental, and social potential (Abdulaziz et al. 2016). Football has transformed into one of the Most popular sports in the world today. Football can also be loved by all ages and all walks of life. (Prawira & Tribinuka 2016). Football requires two teams of 11 players to play it, one of the players is the goalkeeper, and each team tries to defend its goal so as not to concede the ball and score against the opponent (Luxbacher 2011). Nugraha (2013) explained that in soccer, players must be proficient in many aspects, both physical, technical, tactical, and mental. Among these various aspects, fitness plays an important role in entering the professional level, because fitness is a fundamental factor for soccer players to play optimally.

According to Jamaris (2014) intelligence is the ability of an individual to remember something, interpret a concrete or abstract concept, understand the relationship of an object or event that exists and the ability to solve problems faced by individuals from experiences experienced in the surrounding environment. Football also requires intelligence (short term memory) in this case speed in decision making as once stated by Kusuma & Kelli (2015) that short-term memory plays an important role in all cognitive processes and affects not only football, but also intelligence and academic performance of children. Galton in Yuliani (2013) suggests that a person's cognitive superiority is expressed in the superiority of physical strength. Based on the results of a preliminary study with UKM football coach Fikes Sports Club revealed that the average player is only able to play optimally in the first 45 minutes, while excellent physical condition and strong endurance are needed in football, because soccer players last for 2x45 minutes under normal circumstances, As stated by Arsil in Syahda (2016) that "endurance in football is the body's ability to perform activities during the game".

According to Hasanan (2018) explained that general cardiovascular endurance is a person's ability to use the heart, lungs and circulatory systems effectively and efficiently to carry out continuous work that involves contracting a number of muscles with

high intensity for a long time. Sukadiyanto (2011) suggests that "VO2Max is the ability of the human respiratory system to breathe as much oxygen as possible during exercise (physical activity)". According to Sugiharto (2014) in (Putra et al. 2016) The level of individual fitness associated with increased VO2Max depends on the method, intensity of exercise, and test instruments applied to determine VO2Max. According to Budiwanto in (Putra et al., 2016) that Cara measures her own stamina by measuring the player's VO2Max. There are several exercises that coaches can apply to train VO2Max, especially soccer players, including fartlek training, interval training, continuous training, and small sided games. Small sided games are games in which there are two types to increase aerobic capacity, including intermittent and continuous (Koklu et al. 2012). According to Setiyadi (2016) Small sided games are a training model that includes technical, physical and tactical aspects. Maliki et al, (2017) revealed that "Physical strength used in soccer games is endurance, explosive strength, agility and speed". Small sided games are a modified soccer training model with several restrictions, including restrictions on field size, duration, and reduction in the number of players. Game models with ball possession and a small number of players are great for developing an understanding of tactics and honing players' technical skills (Scheunemann in Putra et al. 2016).

Because of the importance of cognitive intelligence and endurance in supporting a sports achievement, therefore researchers have an interest in carrying out research: "The effect of small sided games and dynamic passing training on increasing cognitive intelligence and VO2Max football players".

II. METHOD

The design applied to this study is "Quasi Experimental Design using a two-group pretest and posttest design model". In this research design, ordinal pairing is used to divide the sample into two groups that will be carried out preliminary tests to find out whether there is a difference between the experimental group and the control group in the initial state. According to Sugiyono (2016), pretest data is good if the differences between the two groups are not so significant

Y_1	Z_1	Y_2
Y_3	Z_2	Y_4

Informasi:

Y_1 (Treatment group before treatment)

Y_2 (Treatment group after treatment)

Y_3 (Control group before treatment)

Y_4 (Control group with unequal treatment)

Z_1 (A form of treatment of small sided games)

Z_2 (a form of dynamic passing treatment)

Population is the entire area that includes objects and subjects with characteristics that have been determined by researchers and also drawn conclusions (Sugiyono 2016). The population used in this study is UKM Fikes Sports Club football players with a population of 30 players. While the sample is part of pupolation. The sample will be taken using a sampling technique using purposive sampling. The analysis used in this study is the normality test and homogeneity as a prerequisite test before the hypothesis test. The data is said to be normally distributed if the value of sig. > 0.05 and homogeneous if the value of sig. > 0.05. The hypothesis test used is the t-test, assisted by SPSS app version 26.

III. RESULT AND DISCUSSION

Table 1. Pretest and Posttest results of cognitive intelligence control group

No	Category	Value	Frequency
1	Excellent	15-19	0
2	Good	11-14	3
3	Average	9-10	2
4	Bad	5 – 8	4
5	Very Bad	0 – 4	0
Sum			**9**

No	Category	Value	Frequency
1	Excellent	15-19	0
2	Good	11-14	5
3	Average	9-10	2
4	Bad	5 – 8	2
5	Very Bad	0 – 4	0
Sum			**9**

Comparative data of pretest and posttest cognitive intelligence of the control group can be seen in the table above.

Table 2. Pretest Results of Cognitive Intelligence Treatment Group

No	Category	Value	Frequency
1	Excellent	15-19	0
2	Good	11-14	3
3	Average	9-10	2
4	Bad	5 – 8	4
5	Very Bad	0 – 4	1
Sum			**10**

No	Category	Value	Frequency
1	Excellent	15-19	0
2	Good	11-14	2
3	Average	9-10	3
4	Bad	5 – 8	4
5	Very Bad	0 – 4	1
Sum			**10**

Comparison data of pretest and posttest cognitive intelligence treatment groups can be seen in the table above.

Table 3. Control Group Vo2Max Pretest Results

No	Category	Value	Frequency
1	Extraordinary	52,4)	0
2	Excellent	(46,5 – 52,4)	1
3	Good	(42,5 – 46,4)	0
4	Keep	(36,5 - 42,4)	5
5	Less	(33,0 - 36,4)	2
6	Very Lacking	(≤ 33,0)	1
Sum			**9**

No	Category	Value	Frequency
1	Extraordinary	52,4)	0
2	Excellent	(46,5 – 52,4)	2
3	Good	(42,5 – 46,4)	1
4	Keep	(36,5 - 42,4)	3
5	Less	(33,0 - 36,4)	1
6	Very Lacking	(≤ 33,0)	2
Sum			**9**

The comparison data of the control group's Vo2Max pretest and posttest can be seen in the table above.

Table 4. Pretest Results Vo2Max treatment group

No	Category	Value	Frequency
1	Extraordinary	52,4)	0
2	Excellent	(46,5–52,4)	1
3	Good	(42,5–46,4)	1
4	Keep	(36,5-42,4)	4
5	Less	(33,0-36,4)	2
6	Very Lacking	(≤ 33,0)	2
	Sum		**10**

No	Category	Value	Frequency
1	Extraordinary	52,4)	0
2	Excellent	(46,5 – 52,4)	1
3	Good	(42,5 – 46,4)	5
4	Keep	(36,5 - 42,4)	3
5	Less	(33,0 - 36,4)	1
6	Very Lacking	(≤ 33,0)	0
Sum			**10**

Comparison data of pretest and posttest Vo2Max treatment groups can be seen in the table above

Table 5. Normality test results

Tests of Normality					
		Shapiro-Wilk			
	Group	Statistic	df	Sig.	Ket.
Pre_test_*VO₂Max*	KK	.979	9	.961	Normal
	KT	.959	9	.790	Normal
Post_test_ *VO₂Max*	KK	.894	9	.221	Normal
	KT	.894	9	.217	Normal
Pre_test_DS	KK	.929	9	.469	Normal
	KT	.907	9	.296	Normal
Post_test_DS	KK	.884	9	.173	Normal
	KT	.962	9	.819	Normal

Based on statistical analysis of normality tests that have been carried out using the Shapiro-Wilk test, in all pretest and posttest data passing ability is obtained from the results of the normality test data significance value p > 0.05, which means the data is normally distributed.

Table 6. Homogeneity test results

Test of Homogeneity of Variances				
	Levene Statistic	df1	df2	Sig.
Pre_test_*VO₂Max*	.079	1	17	.781
Post_test_ *VO₂Max*	1.086	1	17	.312
Pre_test_digit span	.313	1	17	.583
Post_test_digit span	1.406	1	17	.252

From the results of the homogeneity test, the control group and the treatment group obtained a significance result above 0.05 which shows that the results of the sample variant are homogeneous.

Table 7. Paired sample t-test and independent sample t-test results

Paired Samples Test				
		T	**df**	**Sig. (2 tailed)**
VO₂Max	*Pre* dan *Posttest* KK	-2.379	8	.045
VO₂Max	*Pre* dan *Posttest* KT	-3.655	9	.005
Digit span	*Pre* dan *Posttest* KK	-.939	8	.375
Digit span	*Pre* dan *Posttest* KT	.497	9	.631

Independent Samples Test						
		Sig.		T	df	Sig. (2-tailed)
Post_test *VO₂Max*	KT	1.086	0.312	-0.997	17	0.333
	KK			-0.982	14.932	0.342
Post_test Digit span	KT	1.406	0.252	1.481	17	0.157
	KK			1.514	15.613	0.150

Based on the paired sample t test results, it did not show any significant from either group. Significant values on the VO2Max test of the treatment group were 0.045 and the control group was 0.005. The data showed that there was a significant influence between the provision of exercise with increased intensity and limited touch. While the significance value of the digit span test, the control group had a value of 0.375 and treatment of 0.631. The data showed that the provision of dynamic passing exercises had no significant effect on test results.

Based on an independent sample t-test against two Posttest data, namely VO2Max capability and digit span. Significance results were obtained on the VO2Max ability test for the treatment group with a value of 0.333 and the control group with a value of 0.342. As for the digit span test results, the significance results of the treatment group with a value of 0.157 and the control group with a value of 0.150. From the results of the two Posttest data, a significance result of > 0.05 was obtained and it can be concluded that there is no significant difference in the effect between the provision of increased intensity training in small sided games and the provision of free touch training in dynamic passing.

DISCUSSION

This study had a sample of 19 out of 30 children who were active in the Fikes Sports club football UKM and were male. This is because 8 respondents did not fill out the letter of willingness, 3 respondents did not meet the research criteria. Based on table 7. shows paired sample test results

T-test digit span with the control group obtained a significance value of 0.375, while the treatment group with a significance value of 0.631 which means there was no significant effect on the provision of small sided games and dynamic passing exercises. Table 4.15 also shows the results of paired sample t-test VO2Max with the control group obtaining a significance result of 0.045 and the treatment group with a significance value of 0.005 which means that there is a significant influence on the provision of small sided games and dynamic passing exercises.

Table 7. is the independent test results on digit span, namely the treatment group showed a result of 0.157 and the control group showed a result of 0.150 and which means that there is no significant difference between the two groups. As for the VO2max ability, the treatment group showed results of 0.333 and the control group 0.342. The results showed that there was no significant difference between the control and treatment groups because the significance value > 0.05.

This research has been carried out with an exercise program in accordance with the exercise dosage guidelines according to Delta youth soccer in Komarudin (2016). Treatment was carried out for 14 meetings and the results of the study stated that there was no effect of small sided games and dynamic passing training on improving cognitive intelligence, due to differences in respondent characteristics, cognitive ability background, small number of respondents and pretest results that were classified as good so that the results of this study were less than optimal in cognitive variables. Meanwhile, the results of the study above stated that there is a significant influence of small sided games and dynamic passing training on increasing VO2Max ability, because in the exercise program has applied important factors in endurance (VO2Max), as stated by Sukadiyanto (2011) that "factors that play an important role in endurance are frequency, duration of exercise, intensity, age, sex, and genetics".

IV. CONCLUSION

Based on the results of research that has been carried out on the effect of small sided games and dynamic passing training on improving cognitive intelligence and VO2Max ability of soccer players, researchers came to the following conclusions: (1). There is no significant effect of small sided games and dynamic passing exercises on cognitive intelligence. (2). There is a significant effect of small sided games and dynamic passing training on VO2Max ability. (3). There was no significant difference in the effect between the control group and the treatment group on cognitive intelligence and VO2Max.

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