



The Effect of Touch of The Ball in Small Side Games on The Improvement Vo2max Amateur Football Players

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Abstract

The aims of this study was: (1) the effect of training the small side games 4v4 two-touch game against VO2max, (2) the effect of training small side games 4v4 free touch against VO2max, and (3) the different effect between small side games 4v4 two touches and small side games 4v4 free touch against VO2max. This research is an experimental research with a modified pre-test – post-test group design. The subjects of this research were 32 amateur football players. MFT was used to measure VO2max in data collecting technique. The data were analyzed by using t-statistical calculation assisted with SPSS 16.0 at 0.05 significance level. The result shows the exercise of small side games 4v4 two touches affected to VO2max (sig value = 0.000), training of small side games 4v4 free touch affected to VO2max (sig value = 0,016) and there are some differences between two touches and free touch training. Coaches are suggested to use small side method in order to improve the VO2max of their players.

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INTRODUCTION

Based on the competition analysis when competing shows that football is a sport that is classified as high intensity sports (Alexandre, et.al, 2012). During the game, each player will find a jump situation, dribbling the ball, shooting the ball, running at different speeds, running with the ball, run in a direction, sliding tackle, controlling the ball under pressure opponent. That situation shows that many factors influence each player (physical, technique, tactics) and the importance of developing these conditions to achieve performance during the match. In this context, the preparation of football players before participating in the competition requires training that matches the demands of the actual match (Reilly in Rodenaz, 2015). Physical conditions are very important as a foundation in supporting other performance for each players. Bad physical conditions will certainly have a bad impact on the appearance techniques and tactics.

According Sajoto (1995:8) there are ten types of physical conditions, which need to be developed among other strength, endurance, muscular power, speed, flexibility, agility, coordination, balance, accuracy, and reaction. Good endurance is one of the physical conditions that must be owned by each player, without reducing the role of the other nine physical conditions. Based on the research stated that non-goalkeeper players usually run as far as 10-12 km in one match. The midfielder position becomes the player with the longest running distance of 12 km in every match. The logical consequence is that each player has a minimum VO₂max level in the good category.

However, based on the observations result at Undiksha FC, one of the amateur clubs that competed in League 3 PSSI, showed the average VO₂max results of the players who were not good enough when referring to Prima Pratama standard. Excluding the goalkeeper, the average VO₂max of the Undiksha FCC players is 42,5 ml/kg/min. The implication of the above is that it is difficult for Undiksha FC players to be able to play with high pressing during defence, or control the ball primed for 90 minutes during offence.

VO₂max is the ability of human respiratory organs to breath as much oxygen as possible during training (Sukadiyanto, 2011: 83). VO₂max or also called maximum oxygen use is the fastest tempo in which a person can use oxygen during exercise. VO₂max is very important to support the work of a muscle by taking oxygen and channeling it to all muscle tissue that is active, so that it can be used for metabolic processes.

According to Irianto (2004: 23) endurance of the heart or also called cardio respiratory is the functional ability of the lungs and heart in supplying oxygen for muscle work for a long time. A person who has good lung and heart endurance will not be quickly exhausted after work. Quality of lung and heart endurance is expressed as VO₂max, which is the maximum amount oxygen that can be consumed in ml/kgbb/minutes. In football games the ability of good aerobic endurance or high VO₂max is highly prioritized.

Small Side Games (SSGs) becomes a popular training method by many amateur and professional teams as an effective method for aerobic exercise by combining technical, tactical and physiological exercises (Rampini et.al. 2007). SSGs method require each player to actively move with high intensity, because players play in a space that is not large and each player touches the ball more frequently. Hill-Haas, et.al (2011) defines small sided games as a game played in field with a size that more than football generally uses modified rules and involves a players that are smaller than actual number of players. Advantages in the Small Side Games methods: (1) many technical elements are contained, tactics and physicality in one exercise, (2) in this exercise there are opponents playing so that it is like a real game and there is an element of mental training.

There are several studies that the influence of the game model of the goal model, and the number of players on the intensity of play on SSGs (Rodenaz, et.al. 2015). The game model is the amount of touch to the ball that is allowed for each player. Whereas the number of players arranged is 4 versus 4, 5 versus 5, 6 versus 6. It turns out that the fewer the number of players involved, the higher the intensity of play shown from the height of the player's Hrmax.

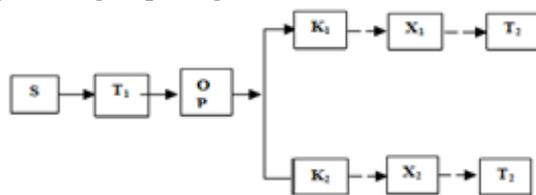
Katis (2009) also revealed the effect of SSGs on the formation of physical conditions and the performance of young football players. Dellal A, et.al (2011) also briefly researched the effect of the number of contact with the ball with SSGs 4 versus 4 models which showed that with a smaller number of ball contacts it would increase the Maximum Heart Rate (HRmax) of each player. So, the less the number of the ball touches by the player and the less number of players involved there will be an increase in Hrmax each player.

Based on this, the researcher is interested in revealing "The Effect of The Number of Touches of Balls in Small Side Games on Increasing VO₂max of Amateur Football Players". Although this was once researched by Dellal A, et.al but the

research subject at that time was an international elite players. Whereas for amateur players there have been no results related to this report and no one has measured the effect of VO2max on the perpetrators.

METHODS

This type of research is experimental. The design of this study uses the modified pre test-post test group design (Kanca, 2010: 87).



Picture 1. The modified pre test-post test group design

The population of this study were all Undiksha FC players who competed in the League 3 PSSI Association of Bali Province in 2018 totaling 32 people, not including the goalkeeper. The population was involved in the study, the research subjects were 32 goalkeepers. Because all of these members include population reseach. So that the 32 reseach subjects were given a pre test namely the Multistage Fitness Test (MFT) first, then divided into two groups using ordinal pairing techniques. Group 1 which will be given training on small side 4v4 games with two touches and group 2 will be given small side 4v4 games with free touches. After the two group were given training 23 times the meeting continued with a post test using the MFT. Data analysis using the t test, but before testing the hypothesis the normality test was first performed using Kolmogorov-Smirnov and Levene’s Test Of Equality Error Variance test to test homogeneity at 5% significance level.

RESULTS AND DISCUSSION

Testing the normality of data distribution is done to ensure that the research subject is normally distributed. To find out the normality of data distribution, the Kolmogorov-Smirnov formula is used at a significance af 0,05. If sig> 0,05 the data is said to be normally distributed. Conversely, if sig< 0,05 the data is not normally distributed. Based on the analysis that has been done using SPSS 16.00 for Windows the results are obtained as shown in the following **Tabel 1**.

Tabel 1. Test the normality of data distribution

	Kolmogorov-Smirnova		
	Statistic	Df	Sig.
Pre test two touch	.200	16	.087
Post test two touch	.154	16	200*
Pre test free touch	.158	16	200*
Post test free touch	.158	16	200*

Based on **Tabel 1** above, it can be seen that for all the significance variables in the Kolmogorov-Smirnov test is greater that 0,05. Thus, all data distribution is normally distributed.

The variance homogeneity test is carried out by grouping based on the given test model. The homogeneity test of variance between groups was carried out with the help of SPSS 16.00 for Windows using Levene’s Test Of Equality Error Variance, statistical hypothesis tested in homogeneity testing is as follows.

Ho : the variance in each group is the same (homogeneous)

Ha : the variance in each group is not the same (not homogeneous)

With the testing criteria used is if Ho p>0.05 where the data has the same variance if the significant number generated is more that 0.05. summary results of data homogeneity calculation using SPSS 16.00 for windows can be seen in the following **Tabel 2**.

Tabel 2. Summary of The Results Homogeneity Test of Variance Test of Homogeneity of Variances

Data group	Levene Statistic	Df1	Df2	Sig.
VO-2max	0,060	1	30	0.808

Based on **Tabel 2** above, the Levene’s test results show that the p>0,05, then accept Ho. So that it can be concluded that the variance in each group is the same (homogeneous).

The research hypothesis that has been stated states that there is an effect of the results of small side games on VO2max. Hypothesis testing using t test with the help of SPSS 16.00 for Windows. The results of the analysis with t test are presented in **Tabel 3** below.

Based on **Tabel 3** above, a significant value of 0,000 is obtained p<0,05. This result is used as a basic in the decision. The decision taken is to reject Ho and accept Ha. This result states that the-

Tabel 3. Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. De- viation	Std. Error Mean	95% Confidence Interval of the Dif- ference				
				Lower	Upper			
Pair 1 wotouch – twotouch	-3.96250	1.71109	.42777	-4.87428	-3.05072	-9.263	15	.000
Pair 2 freetouch – freetouch	-1.90625	2.82382	.70595	-3.41096	-.40154	-2.700	15	.016

re is a training effect for small side games against VO2max. So it can be concluded that there is a significant influence between small side games and VO2max training.

Based on the testing of the first hypothesis it turns out that there is a significant effect of the training of 4v4 two touch small side games on VO2max ($p < 0.05$). The small side 4v4 two touch training exercise is a 4 versus 4 game simulation training with the rules that every player is allowed to touch the ball for a maximum of 2 times in a row. so that in this training can increase speed, agility in the game and of course increase endurance. Based on Arcos's research, Asier Los et.al. (2015) also states that SSGs have a significant effect on improving aerobic fitness and are better than interval training methods. Rodenas, et.al. (2015) also suggested that the modification of the game model, the goal model, and the number of players in SSGs affected the intensity of playing for elite young players. Modification of the number of players means that the smaller the number of players involved the higher the heart rate (HRmax) the players involved. The training of small side games 4v4 two touch has the advantage that all players are more active in moving to carry out cooperation in attack and the passing must be precise and accurate. Dellal, et. al. (2011) also revealed that there was a faster increase in Heart Rate (HR) players who performed SSGs one touch (1T), two touch (2T) than players who performed SSGs free play or free touch.

Based on the second hypothesis testing, there was a significant influence from the training of small side games 4v4 free touch on VO2max ($p < 0.05$). Small side games 4v4 free touch training is a 4 versus 4 game simulation training with the rules of play for each player is not limited to the maximum number of touches with the ball, so that in this exercise there will be more dueling, HR response also increased (Dellal, et. Al. 2011). This small side 4v4 free touch training training is very beneficial because it can create space and also disrupt the opponent's guard.

Based on the testing of the third hypothesis, there was a significant difference in the effect of training in small side 4v4 two touch games with small side games 4v4 free touch on VO2max. Whereas the small side games 4v4 two touch training is greater than the small side 4v4 free touch games. Two touch SSGs characters require each player to move more or in other words, each player cannot linger over the ball. So that every player has very little active rest time. HR automatically increases each player very fast compared to free touch. Free touch SSGs can linger on the ball for a long time, so that other players who don't control the ball can take a longer active break which directly reduces the HR of each player.

CONCLUSION

Based on the results of data analysis and discussion above, it can be concluded that the number of ball touches in small side games affects the increase in VO2max of amateur soccer players. So that it is expected that football coaches and football extracurricular coaches can implement the exercise to increase the VO2max of their players / students.

REFERENCES

- Alexandre, D., da Silva, C. D., Hill-Haas, S., Wong, D. P., Natali, A. J., de Lima, J. R. P., & Karim, C. 2012. "Heart rate monitoring in soccer: Interest and limits during competitive match play and training, practical application". *Journal of Strength and Conditioning Research*. 26. 2890–2906.
- Arcos, Asier Los., Vazquez, J. S., Martin, J., Lerga, J., Sanchez, F., Villagra, F., Zulueta, J. J. 2015. "Effects of Small-Sided Games vs. Interval Training in Aerobic Fitness and Physical Enjoyment in Young Elite Soccer Players". *PLoS ONE* 10(9): e0137224. doi:10.1371/ journal.pone.0137224.
- Dellal, A., Lago, C., Wong, D.P., Chamari, K. 2011.

- “Effects of the number of ball contacts within bouts of 4 vs 4 small-sided games”. *Int J Sports Physiol Perf.* 6(3). 322-333.
- Hill-Haas, S. V., Dawson, B., Impellizzeri, F. M., & Coutts, A. J. 2011. “Physiology of small-sided games training in football: A systematic review”. *Sports Medicine.* 41. 199–220.
- Irianto, Djoko Pekik. 2004. *Bugar dan Sehat Dengan Olahraga.* Yogyakarta : Andi Offset.
- Kanca, I Nyoman. 2010. *Metode Penelitian Pengajaran Pendidikan Jasmani dan Olahraga.* Singaraja: Universitas Pendidikan Ganesha.
- Katis, A., Kellis, E. 2009. “Effects of small-sided games on physical conditioning and performance in young soccer players”. *Journal Sports Science and Medicine.* 8(3). 374-380.
- Muzakir, Doddy Rachman. 2013. “Para Pekerja Keras Di Liga Champion”. Tersedia pada <http://lab-bola.com/para-pekerja-keras-di-liga-champions/>. Diakses pada tanggal 27 November 2017.
- Rampinini E, Impellizzeri, F. M., Castagna, C., Abt, G., Chamari, K., Sassi, A., Marcora, S. M. 2007. “Factors influencing physiological responses to small-sided soccer games”. *Journal Sport Science.* 25(6). 659-666.
- Rodenas, J. G., Calabuig, F., Aranda, R. 2015. “Effect of the Game Design, the Goal Type, and the Number of Players on Intensity of Play in Small-Sided Games in Youth Elite Players”. *Journal of Human Kinetics.* 49. 229-235
- Sajoto, Mochamad. 1995. *Peningkatan dan Pembinaan Kekuatan Kondisi Fisik.* Semarang : Dahara Prize.
- Sukadiyanto dan Muluk, D. 2011. *Pengantar Teori dan Metodologi Melatih Fisik.* Bandung: Lubuk Agung.