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## Effect of small side game training, small side game combined training program with plyometric and age on muscle power, agility and football skills

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### Abstract

Training programs are one of the important factors in developing potential players in football. Therefore, a valid and reliable training program in football is needed. This study used a combination of plyometric exercises and small side games 4 vs 4 and 5 vs 5. This study aims to analyze the small side game training program, a combination of small side games with plyometric on muscle power, agility and football skills. This study used football players who needed a very fast neuromuscular mixed method approach. The subjects of this study were junior football players as many as 40 people. The instrument used the David lee to measure skill, the Illinois Agility test for agility and the Standing broad jump for muscle power. The data analysis used in this study was the MANOVA test through SPSS 25. Results of this Study (1). There is a difference in the effect of small side game training, combined small side game training with plyometric on skills with a significance of  $0.000 < 0.05$ . (2) There is no difference in the effect of small side game training, combined small side game training with plyometric on agility  $0.322 > 0.05$ . (3) There is a difference in the effect of small side game training, combined small side game training with plyometric on muscle power with a significance value of  $0.002 < 0.05$ .

**Keywords:** Small side game, plyometric, age, football skills, agility, muscle power

### Introduction

The game of soccer is a team sports game with high intensity, ideally requiring technique (Joo, C. H, *et al* 2016; Beato, M. *et al.*, 2014) <sup>[10, 2]</sup>, speed (Rabbani A, *et al.*, 2019) <sup>[15]</sup>, strength (Negra, Y, *et al.*, 2017; Peñailillo, L *et al.*, 2016) <sup>[12, 13]</sup>, agility (Hammami, M *et al.*, 2018) <sup>[8]</sup> and Vo2 mak (Jalalian, Z., & Fallah, M., 2016; Saedmocheshi *et al.*, 2016; Radzimiński *et al.*, 2019) <sup>[9, 17, 16]</sup>. In addition, according to Casamichana, D *et al.* (2018) <sup>[3]</sup> said that soccer requires technical skills and decision-making abilities.

Some opinions state that small-sided games (SSG) training methods that can simultaneously improve the techniques and physical components of team sports and individual game sports (Halouani, J *et al.*, 2017; Christopher, J. *et al.*, 2016; Lacomme, M. *et al.*, 2018) <sup>[7, 4, 11]</sup>. This is reinforced by the results of research by Querido SM, and Clemente FM (2020) <sup>[14]</sup>, showing that small-sided games combination training with strength and power training can significantly increase aerobic capacity, strength, speed, agility and muscle power for soccer players aged 19 years. In addition, Clemente F, and Sarmento H. (2020) <sup>[5]</sup> have conducted research with the aim of testing the differences in small-sided games formats 5 vs 5, 6 vs 6, 7 vs 7, 8 vs 8, 9 vs 9, 10 vs 10 and 11 vs 11, the results show that smaller formats have a good effect on improving soccer techniques and skills. Meanwhile, according to Aprianto (2021) <sup>[1]</sup>, *Small Sided Games* is an exercise that has a good impact on improving a technique because this method can create an actual game situation where this method also combines several aspects such as technique, tactics and even physical. Coaches who use the *small-sided games* (SSG) method provide soccer skills training in a form similar to the actual game situation in a football match and involve all players in a form of practice. SSG has an impact on increasing movement acquisition and decision-making skills (Davids *et al.*, 2013) <sup>[6]</sup>, increasing technical ability and agility (Young & Rogers, 2014) <sup>[18]</sup> with greater comfort in doing so (Arslan *et al.*,

2020) [19].

### Research Ethos

This study used experiments with a 2 x 2 factorial design. This research is divided into three stages which begin with conducting an initial test (Pre-test) only then the second stage is carried out, namely the provision of the Exercise method and ends with the final test (post-test)

### Research subjects

The subjects of the study were SSB Gunung Tunggal Regency 50 Kota players totaling 40 people and divided into two age categories, namely ages 10-12 years and ages 15-17 years. The instruments in this study used three types of tests, namely the David lee for football skill tests, the Illinois Agility Test for agility tests and standing broad jumps for leg muscle power

### Data Analysis

Data were analyzed using the MANOVA test through the SPSS 25 application. After that, it continued with the Tukey test.

### Hioptetik test procedure

The subjects of the study were SSB players of the single Mountain District of 50 Cities, a total of 40 people consisting of two age categories, namely the age of 10-12 years and 15-17 years, the study was conducted by applying two exercise methods, namely small side game exercises and combined small side games with plyometric for 16 meetings which were initially seen at first (Pre-test) and ended with a final test (Post-test).

### Hasil and Discussion

Results of the analysis MANOVA test of playing practice methods (small side game and small side game combined training with plyometric) and age on football skills

**1. Hypothesis There is an interaction of playing practice methods (small side games and small side game combined exercises with plyometric) and age to soccer skills MANOVA test results Interaction of Playing Training methods and age on football skills**

**Table 1:** Tests of Between-Subjects Effects

Dependent Variable: Football skills					
Source	Type III Sum of Squares	DF	Mean Square	F	Sig.
Corrected Model	255.398 <sup>A</sup>	1	255.398	22.214	.000
Intercept	143814.016	1	143814.016	12508.686	.000
Age	.000	0	.	.	.
Exercise	.000	0	.	.	.
Age * Exercise	.000	0	.	.	.
Error	896.776	78	11.497		
Total	144966.190	80			
Corrected Total	1152.174	79			

a. R Squared = .222 (Adjusted R Squared = .212)

From the results of the MANOVA test output in the table above which displays the effectiveness of the small side game program, and the combination of small side game training with plyometric on muscle power, agility and football skills. From the table above, all significance (Sig.) is obtained at P = 0.000. Because the significance value < 0.05 shows that together, the two play exercises have an effect on their effectiveness, Ho was rejected. Thus, from both training methods of playing small side games, and combining small

side games with plyometric have a positive influence on improving football skills.

**2. There is no effect of playing training methods (small side games and combined small side game exercises with plyometric) and age on agility**

Results of the analysis MANOVA test interaction of playing training methods (small side game and small side game combined exercise with plyometric) and age to agility

### MANOVA test results interaction of exercise methods playing and age to agility

**Table 2:** Tests of between-subjects effects

Dependent Variable: Agility					
Source	Type III Sum of Squares	DF	Mean Square	F	Sig.
Corrected Model	1.336 <sup>A</sup>	1	1.336	.995	.322
Intercept	20474.240	1	20474.240	15248.450	.000
Age	.000	0	.	.	.
Exercise	.000	0	.	.	.
Age * Exercise	.000	0	.	.	.
Error	104.731	78	1.343		
Total	20580.308	80			
Corrected Total	106.068	79			

a. R Squared = .013 (Adjusted R Squared = .000)

From the results of the MANOVA test output in the table above which displays the effectiveness of the small side game program, and the combination of small side game training with plyometric on muscle power, agility and football skills. From the table above, all significance (Sig.) is obtained at P =

0.322. Because the significance value > 0.05 shows that together, the two play exercises have no effect on their effectiveness, Ho is accepted. Thus, both small side game training methods, and the combination of small side games with plyometric did not have a positive effect on improving

agility in football.

### 3. There is an interaction of playing training methods (small side game and small side game combined exercises

with plyometric) and age on muscle power

Results of the analysis of the MANOVA test of playing training methods (small side game and combined small side game exercises with plyometric) and age on muscle power.

#### MANOVA test results Interaction of training methods play and age on muscle power

**Table 3:** Tests of Between-Subjects Effects

Dependent Variable: muscle power					
Source	Type III Sum of Squares	DF	Mean Square	F	Sig.
Corrected Model	9945,800 <sup>A</sup>	1	9945.800	10.121	.002
Intercept	3369384.050	1	3369384.050	3428.810	.000
Age	.000	0	.	.	.
Exercise	.000	0	.	.	.
Age * Exercise	.000	0	.	.	.
Error	76648.150	78	982.669		
Total	3455978.000	80			
Corrected Total	86593.950	79			

a. R Squared = .115 (Adjusted R Squared = .104)

From the results of the MANOVA test output in the table above which displays the effectiveness of the small side game program, and the combination of small side game training with plyometric on muscle power, agility and football skills. From the table above, all significance (Sig.) is obtained at  $P = 0.002$ . Because the significance value  $< 0.05$  shows that together, the two play exercises have an effect on their effectiveness,  $H_0$  was rejected. Thus, from both training methods playing small side games, and combined small side games with plyometric have a positive influence on increasing muscle power.

#### Conclusion

Based on the results and discussion, it can be concluded that the small side game training program, a combination of small side games with plyometric in improving agility, muscle power and football skills Results of this study

(1). There is a difference in the effect of small side game training, combined small side game training with plyometric on skills with a significance of  $0.000 < 0.05$ . it proves that small side game training, combined small side with plyometric and age has an influence and is suitable to be applied in improving the skills of football players. both at the age of 10-12 years and at the age of 15-17 years

(2) There is no difference in the effect of small side game training, combined small side game training with plyometric on agility  $0.322 > 0.05$ . This proves that small side game training, a combination of small side with plyometric and age has no influence and is less suitable to be applied in increasing the agility of soccer players both at the age of 10-12 years and 15-17 years.

(3) There is a difference in the effect of small side game training, a combination of small side game training with plyometric on muscle power with a significance value of  $0.002 < 0.05$ . This proves that small side game training, a combination of small side with plyometric and age has an influence and is suitable to be applied in increasing muscle power in soccer players, both at the age of 10-12 years and at the age of 15-17 years

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