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## Impact of small sided football training on strength endurance and coordination of football players

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### Abstract

The purpose of the study was to find out the effect of small sided football training (SSFT) on strength endurance and coordination of football players. To realize the purpose of the study twenty collegiate football players were selected from Soka Ikeda college of Arts & Science for Women, Chennai, Tamil Nadu. The selected subject age ranged between 17 to 23 years. Further they were classified at random in two equal groups of 10 (n=10) subjects each. Group - I (Experimental Group) underwent SSFT for thrice a week for six weeks of training programme, in the morning from 6.30 onwards and each section lasted 45 minutes to 60 minutes and the Group – II - acted as a control group (CG) they did not participate in any kind of training programme part from the daily activities. The selected criterion variables of strength endurance and coordination were measured by wall sit test and alternative hand wall toss test was used. The collected data were analysed statistically throughout analyze of covariance (ANCOVA) to find the significance difference. The results of the study showed that chosen variables such as strength endurance and coordination were significantly improved due to SSFT of football players.

**Keywords:** Small sided football training, strength endurance, coordination

### Introduction

Small-sided games (SSGs) are played on reduced pitch areas, often using modified rules and involving a smaller number of players than traditional football. These games are less structured than traditional fitness training methods but are very popular training drills for players of all ages and levels. At present, there is relatively little information regarding how Small-sided games (SSGs) can best be used to improve physical capacities and technical or tactical skills in footballers. However, many prescriptive variables controlled by the coach can influence the exercise intensity during Small-sided games (SSGs). Coaches usually attempt to change the training stimulus in Small-sided games (SSGs) through altering the pitch area, player number, coach encouragement, training regimen (continuous vs interval training), rules and the use of goalkeepers. In general, it appears that Small-sided games (SSGs) exercise intensity is increased with the concurrent reduction in player number and increase in relative pitch area per player. However, the inverse relationship between the number of players in each Small-sided games (SSGs) and exercise intensity does not apply to the time-motion characteristics. Consistent coach encouragement can also increase training intensity, but most rule changes do not appear to strongly affect exercise intensity. The variation of exercise intensity measures are lower in smaller game formats (e.g. three vs three) and have acceptable reproducibility when the same game is repeated between different training sessions or within the same session. The variation in exercise intensity during Small-sided games (SSGs) can also be improved with consistent coach encouragement but it is still more variable than traditional generic training methods. Other studies have also shown that Small-sided games (SSGs) containing fewer players can exceed match intensity and elicit similar intensities to both long- and short-duration high intensity interval running. It also appears that fitness and football-specific performance can be improved equally with Small-sided games (SSGs) and generic training drills.

Small sided football games have been comprehensively utilized in training footballers worldwide and have indicated awesome adequacy in improving player execution (Hill-Haas, Dawson, Impellizzeri, & Coutts, 2011) [4, 7]. For instance, it has been exposed that the specialized performance (Owen, Wong del, McKenna, & Dellal, 2011) [5, 2] and physical performance (Chaouachi *et al.*, 2014; Dellal, Varliette, Owen, Chirico, & Pialoux, 2012) [1, 2, 5]

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of footballers can be enhanced using small sided games based football training programmes. In the last two decades, extensive research has been published on physical and physiological response during Small sided games in football (Halouani, Chtourou, Gabbett, Chaouachi & Chamari, 2014) [1, 3].

### Methodology

To realize the purpose of the study twenty collegiate football players were selected from Soka Ikeda College of Arts & Science for Women, Chennai, Tamil Nadu. The selected subject age ranged between 17 to 23 years. Further they were classified at random in two equal groups of ten (n=10) subjects each. Group - I (Experimental Group) underwent SSFT for thrice a week for six weeks of training programme, in the morning from 6.30 onwards and each session lasted 45 minutes to 60 minutes and the Group – II - acted as a control group (CG) they did not participate in any kind of training programme part from the daily activities. The selected criterion variables of strength endurance and coordination were measured by wall sit test and alternative hand wall toss test was used.

### Training programme

During the training period the experimental group underwent

their training programmes for thrice a week for 6 weeks. In addition to their daily routine activities as per the schedule. The duration of training was planned 45 min to 60 min, that is from 6.30 am onwards on Mondays, Wednesdays and Fridays. All the subjects involved in this study were carefully monitored throughout the training programme intensity of the experimental training was based on difficulty of the exercise, sets, repetitions and recovery time. The training session consist of 15 min warm up in the beginning, recreation 10min, 20 min drill and games and last 15 min cool down include stretching exercise and discussion.

### Statistical technique

The collected data were analysed statistically throughout analyze of covariance (ANCOVA) to find the significance difference.

### Analysis of data

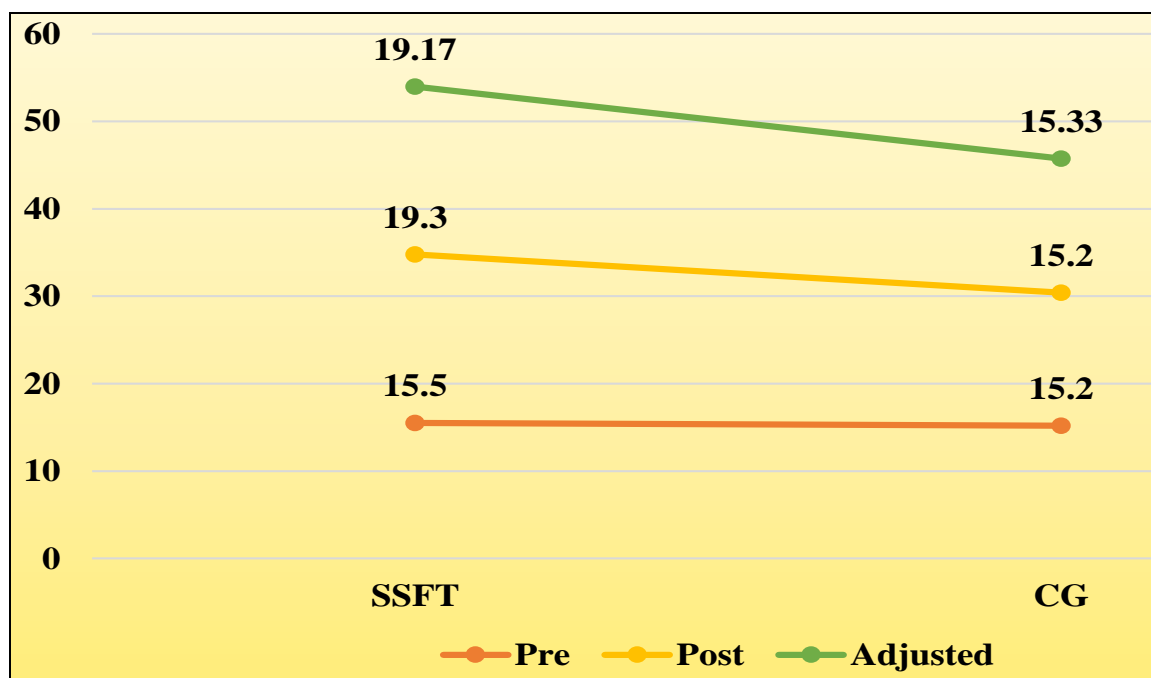
The data collected prior and after the experimental periods on strength endurance and coordination of Experimental Group (Group-I) and Control Group (Group – II) were analysed and presented in table – I & II. The level of significance was fixed at 0.05 level of confidence to test the 'F' ratio obtained by analysis of covariance.

**Table 1:** Analysis of covariance for pre and post data on strength endurance

Test	Experimental Group (SSFT)	Control Group (CG)	Source of Variance	Sum of Squares	DF	Mean square	F
Pre-test mean	15.50	15.20	Between	0.45	1	0.45	0.37
			Within	22.1	18	1.23	
Post-test mean	19.30	15.20	Between	84.05	1	84.05	50.94*
			Within	29.70	18	1.65	
Adjusted mean	19.17	15.33	Between	72.28	1	72.28	93.14*
			Within	13.19	17	0.78	

\*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level of confidence with df 1 and 18 and 1 and 17 were 4.41 and 4.45 respectively).

The pre, post and adjusted means on strength endurance were presented through line diagram for better understanding of the results of this study in Figure-1.



**Fig 1:** Pre, post and adjusted post-test differences of the small sided football training and control groups on strength endurance

**Discussion on findings of strength endurance**

The study investigates the impact of Small Sided Football Training (SSFT) on strength endurance, utilizing pre-test and post-test scores with statistical analysis to demonstrate significant improvements. Initial randomization confirmed no significant differences between groups ( $F = 0.37$ , critical  $F = 4.41$ ), validating effective random assignment. Post-intervention, SSFT significantly enhanced strength endurance as indicated by a substantial  $F$  value of 50.94 (critical  $F = 4.41$ ), consistent with findings in literature supporting the efficacy of small-sided games in improving aerobic capacity and muscular endurance (Hill-Haas *et al.*, 2011) [4]. Adjusted mean scores analysis further underscored the

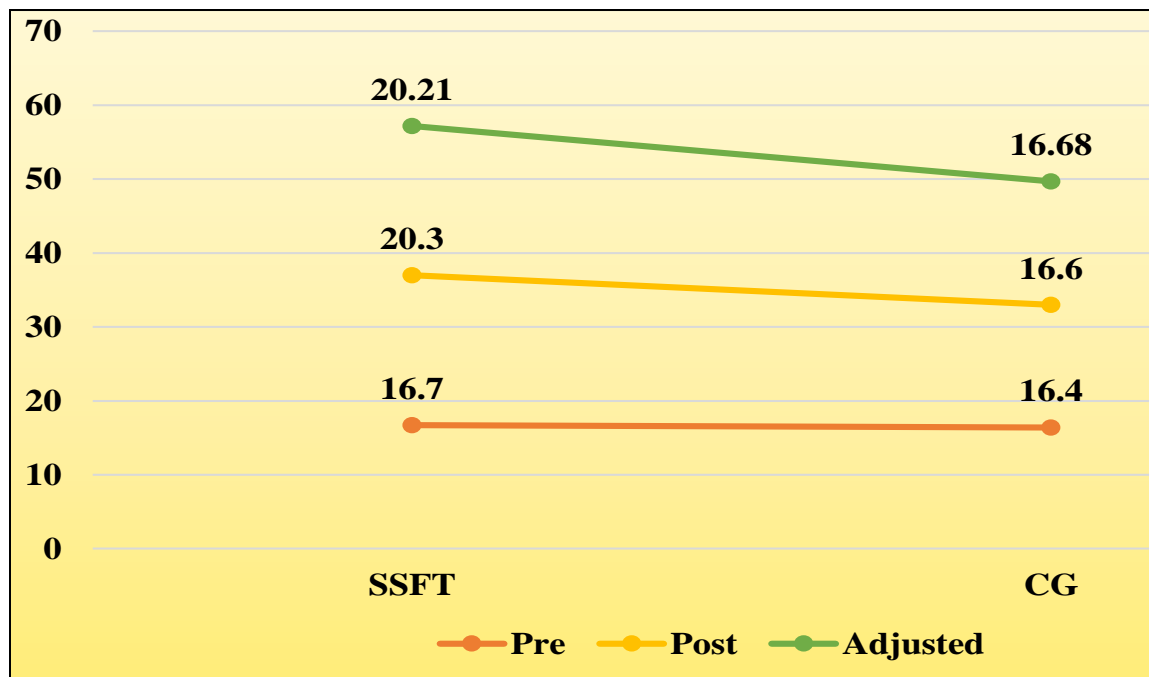
effectiveness of SSFT ( $F = 93.14$ , critical  $F = 4.45$ ), emphasizing its role in developing strength endurance through dynamic, high-intensity activities akin to real-game scenarios (Impellizzeri *et al.*, 2006) [7]. This study's outcomes align with previous research, suggesting SSFT's superiority over traditional training methods in enhancing physical fitness components such as strength endurance (Dellal *et al.*, 2012) [2]. Practical implications include SSFT's integration into training regimens to optimize athletic performance across diverse contexts, warranting further exploration of long-term effects and protocol variations for comprehensive training strategies.

**Table 2:** Analysis of covariance for pre and post data on coordination

Test	Experimental Group (SSFT)	Control Group (CG)	Source of variance	Sum of Squares	DF	Mean square	F
Pre-test Mean	16.7	16.4	Between	0.45	1	0.45	0.36
			Within	22.5	18	1.25	
Post-test Mean	20.3	16.6	Between	68.45	1	68.450	84.97*
			Within	14.5	18	0.81	
Adjusted Mean	20.21	16.68	Between	61.18	1	61.19	137.7*
			Within	7.5	17	0.44	

\*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level of confidence with df 1 and 18 and 1 and 17 were 4.41 and 4.45 respectively).

The pre, post and adjusted means on coordination were presented through bar diagram for better understanding of the results of this study in Figure-2.



**Fig 2:** Pre, post and adjusted post-test differences of the small sided football training and control groups on strength endurance

**Discussion on findings of coordination**

The study investigated the impact of Small Sided Football Training (SSFT) on coordination through pre-test and post-test score analyses. Initially, the obtained  $F$  value of 0.36 did not reach the critical value of 4.41 at the 0.05 significance level, indicating no significant differences between groups initially and affirming equal randomization. However, following SSFT, post-test analysis revealed a substantial  $F$  value of 84.97, surpassing the critical value of 4.41, demonstrating significant differences in post-test mean scores among subjects. Further analysis of adjusted mean scores, which accounted for pre and post-test variations, yielded an  $F$

value of 137.7, exceeding the critical value of 4.45. This underscores significant differences in coordination due to SSFT, aligning with existing literature on the efficacy of small-sided games in enhancing motor skills and coordination abilities. For instance, research by Hill-Haas *et al.* (2011) [4] has shown that small-sided games improve not only physical fitness but also technical skills and coordination in football players. Similarly, a study by Sáez de Villarreal *et al.* (2015) [6] demonstrated significant improvements in agility and coordination following small-sided games training interventions. Parasuraman, (2020) [8] revealed that significant improvement due to circuit training with Kettlebell on

performance related variables among volleyball players. These findings emphasize the practical application of SSFT in enhancing coordination skills, thereby contributing to the overall athletic development of participants.

### Conclusion

The results of the study concluded that six weeks of small sided football games training significantly improved Strength endurance and coordination of collegiate football players.

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