



## A Comparative Effect of Soccer Training in Small Playfield and Regular Official Size Playfield in the Selected Physical Fitness Parameters

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**Abstract:** The purpose of the present study was to determine the effect of training in small size playfield and regular official size playfield in the selected physical fitness parameters. Sixty six districts level male soccer players (age 17-25) of Assam were divided into three unequated group in equal number. Two experimental groups, Group-A and Group-B had gone through the 12 weeks training programme consist of general conditioning, techno-tactical (special conditioning) training and game practice progressively for two and half hour par day, five days per week in Small Playfield (SP) and Regular Official Size Playfield (ROSP) respectively and Control Group-C did not participate to any special training programme. The selected physical fitness parameters were measured before and immediately after completion of the training programme. To find out the pre and post training performance and significance differences among the groups the collected data were analyzed statistically through T-test, Analysis of Variance (ANOVA) and Analysis of Co-variance (ANCOVA). The level of significance was observed at 0.05 level of confidence. The finding shows that the selected physical fitness parameters (Speed,  $t = 8.10 > 2.08$ ; Explosive Leg Strength,  $t = 3.49 > 2.08$ ; Agility,  $t = 3.22 > 2.08$ ; Eye-leg Coordination,  $t = 3.60 > 2.08$ ; Cardiovascular Endurance,  $t = 5.76 > 2.08$ ) of Group-A (SP) were improved significantly. In case of Group- B (ROSP) there were significant improvement of Speed ( $t = 6.49 > 2.08$ ), Explosive Leg Strength ( $t = 2.87 > 2.08$ ), and Cardiovascular Endurance ( $t = 7.94 > 2.08$ ). There also significant differences were found between pre test and post test means of composite scores of selected physical fitness parameters in both the experimental group A and B ( $t = 6.81$  and  $6.53 > 2.08$ ). Insignificant difference was found in the pre-test means of three selected groups as the obtained F-value of 0.072 is less than that of tabulated F-value of 3.144 for the d.f. of 2/63 at 0.05 level and significant difference was found in the post-test means and adjusted means of three selected groups as the F-Value 32.10 and 181.256 are quite higher than the tabulated F-value of 3.144 and 3.146 respectively at 0.05 level of confidence.

**Key Words:** Soccer, Small Playfield, Regular Official Size Playfield, Physical Fitness Parameters



## INTRODUCTION

Now-a-days sports become a part and parcel of life. Millions of fans follow different sports event all over the world with an enthusiasm bordering on devotion [1-2-3]. Many people participate in sports and games for happiness, pleasure health and fitness [4]. Increased participation in sports has resulted in competition, which has become an important element of modern life [5].

Soccer is one of the most widely played and complex sports in the world, where players need technical, tactical, and physical skills to succeed [6-7]. Soccer performance depends upon a myriad of factors such as technical, biomechanical, tactical, mental and physiological areas [8]. One of the reasons that soccer is so popular worldwide is that players may not need to have an extraordinary capacity within any of these performance areas, but possess a reasonable level within all areas [9]. However, there are trends towards more systematic training and selection influencing the anthropometric profiles of players who compete at the highest level. As with other activities, soccer is not a science, but science may help improve performance. Efforts to improve soccer performance often focus on technique and tactics at the expense of physical fitness. The game football is a very vigorous and strenuous one [10]. Modern soccer is a very fast by its nature and it is skilled game for the well conditioned sportsman, who most possesses strength, speed, agility, balance, flexibility, endurance, co-ordination and many other in defined qualities such as dribbling, kicking, for passing and shooting at the goal [11]. Performance in soccer is a consequence of physical, physiological, psychological factors along with technical and tactical skills of an individual [12]. As with other sports, soccer is not a science but science may help to improve performance [13-14].

Fitness from the stand point of the football players means that the player must have a high standard of physical and physiological condition, which makes possible through the perfect functioning of the organs of locomotion and circulation and of nervous system, the maximum possible use and application of his physical and mental capabilities and knowledge of football [15]. Research shows that in soccer endurance, speed, agility, maximum leg strength, upper body strength, leg power, muscular endurance, flexibility, coordination, maximum fitness of organism and reaction time are important pre-requisite for efficient soccer performance [16-17].

## METHODOLOGY

For the present study sixty six (66) district level male soccer players (age 17-25) from four district of Assam, India were selected randomly. The subjects were randomly divided into three unequated groups in equal number. The two experimental treatments were also assigned to the two groups randomly and the third group was served as control group. Each group was consisted of twenty two soccer players. The experimental groups were participated in two different training programs. Group A was given training in small playfield (SP) and Group B in Regular Official size playfield (ROSP). The training was administered for 12 weeks, 5 days a week in a progressive manner. The timing of the training was from 3 p.m. to 5.30 p.m. The pre test and post test data pertaining to this study were collected before and immediate after completion of training program. The tests were conducted only during the evening session.



The data were collected on the selected Physical Fitness parameters- Speed, Explosive Leg Strength, Agility, Eye-Leg Coordination, Cardio-vascular Endurance were measured by using 50 Yard Dash test, Standing Broad Jump test, 12 min. Run-Walk Semo-Agility test, Eye-foot coordination test respectively.

The collected data i.e. the raw-scores of each test were converted into t-scores and then all the t-scores of all the selected physical fitness parameters of each group were converted into composite scores. Then the data were analyzed by employing the studentized t-test to determine the significant difference between the pre-test and post-test means of all the three groups viz. Experimental Group- A training in small playfield, Experimental Group B training in regular playfield and Control Group C separately. With these composite scores Analysis of Variance and Covariance Statistical methods also employed to find out the difference among the groups as the groups were selected randomly and not equated. While F-test was found to be significant to determine the paired mean difference LSD Post hoc test was employed. For testing hypothesis the level of significance was set at 0.05, which was considered to be adequate for the purpose of the study.

## RESULTS AND DISCUSSION:

**TABLE - 1**  
**SUMMARY OF MEAN, STANDARD DEVIATION AND T-RATIO OF PHYSICAL FITNESS PARAMETERS OF EXPERIMENTAL GROUP-A**

Parameter	Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Speed	Pre	6.53	0.39	0.94	0.116	8.10*
	Post	5.59	0.38			
Explosive Leg Strength	Pre	234.82	17.60	15.91	4.546	3.498*
	Post	250.73	12.04			
Agility	Pre	11.78	0.99	0.95	0.295	3.22*
	Post	10.83	0.97			
Eye-Leg Co-ordination	Pre	6.13	0.88	0.89	0.247	3.603*
	Post	5.24	0.76			
Cardiovascular Endurance	Pre	2605.68	84.14	146.59	25.42	5.766*
	Post	2752.27	84.48			

\* Significant at 0.05 level

Tabulated  $t_{0.05(21)}=2.080$

It is evident from the above table that among the selected physical fitness parameters Speed ( $t=8.10$ ), Explosive leg strength ( $t=3.498$ ), Agility ( $t=3.22$ ), Eye-leg coordination ( $t=3.603$ ) and Cardiovascular endurance ( $t=5.766$ ) show significant difference in between pre and post test means, as all the calculated t-values are greater than that tabulated t-value of 2.08 at 0.05 level of confidence.



**TABLE - 2**  
**SUMMARY OF MEAN, STANDARD DEVIATION AND T-RATIO OF PHYSICAL FITNESS PARAMETERS OF EXPERIMENTAL GROUP-B**

Parameter	Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Speed	Pre	6.49	0.37	1.02	0.157	6.496*
	Post	5.47	0.34			
Explosive Leg Strength	Pre	232.36	14.99	11.96	4.162	2.87*
	Post	244.32	12.51			
Agility	Pre	11.91	0.91	0.42	0.27	1.555
	Post	11.49	0.89			
Eye-Leg Co-ordination	Pre	5.96	0.94	0.30	.286	1.048
	Post	5.66	0.96			
Cardiovascular Endurance	Pre	2622.73	75.56	162.50	20.45	7.946*
	Post	2785.23	59.10			

\* Significant at 0.05 level

Tabulated  $t_{0.05(21)}=2.080$

Above table shows that there are significant difference between the pre and post test means in the selected physical fitness parameters i.e. Speed ( $t=6.496$ ), Explosive leg strength ( $t=2.87$ ) and Cardiovascular endurance ( $t=7.946$ ) as all the calculated t-values are greater than the tabulated t-value of 2.08 at 0.05 level of confidence. It is also evident from the same table that Agility ( $t=1.555$ ) and Eye-leg coordination ( $t=1.048$ ) do not show significant difference because obtained t-values are less than that of tabulated t-value of 2.08 at 0.05 level.

**TABLE - 3**  
**SUMMARY OF MEAN STANDARD DEVIATION AND T-RATIO OF PHYSICAL FITNESS PARAMETERS OF CONTROL GROUP-C**

Parameter	Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Speed	Pre	6.51	0.44	0.01	0.129	0.077 <sup>@</sup>
	Post	6.52	0.42			
Explosive Leg Strength	Pre	234.86	20.25	0.68	5.77	0.117 <sup>@</sup>
	Post	234.18	17.98			
Agility	Pre	11.79	0.84	0.01	0.256	0.039 <sup>@</sup>
	Post	11.78	0.86			
Eye-Leg Co-ordination	Pre	6.53	1.08	0.07	0.324	0.216 <sup>@</sup>
	Post	6.60	1.07			
Cardiovascular Endurance	Pre	2620.23	72.14	18.41	23.037	0.799 <sup>@</sup>
	Post	2638.64	80.45			

<sup>@</sup> Not significant at 0.05 level

Tabulated  $t_{0.05(21)}=2.080$



From the above table it is learnt that the selected physical fitness parameters Speed ( $t=0.077$ ), Explosive leg strength ( $t=0.117$ ), Agility ( $t=0.039$ ), Eye-leg coordination ( $t=0.216$ ) and Cardiovascular endurance ( $t=0.799$ ) do not show significant difference in between pre and post test means, as all the calculated t-values are less than the tabulated t-value of 2.08 at 0.05 level of confidence.

**TABLE - 4**  
**SUMMARY OF MEAN, STANDARD DEVIATION AND T-RATIO OF COMPOSITE SCORES OF PHYSICAL FITNESS PARAMETERS OF EXPERIMENTAL GROUP-A, EXPERIMENTAL GROUP-B AND CONTROL GROUP-C**

Group	Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Experimental Group-A	Pre	232.96	28.35	57.41	8.42	6.818*
	Post	290.37	27.51			
Experimental Group-B	Pre	234.18	25.72	46.72	7.152	6.53*
	Post	280.90	21.54			
Control Group-C	Pre	230.88	32.84	1.61	9.726	0.165
	Post	229.27	31.67			

\* Significant at 0.05 level

Tabulated  $t_{0.05(21)}=2.080$

It is evident from the above table that the mean of composite score of selected physical fitness parameters Experimental Group A ( $t=6.818$ ) and Experimental Group B ( $t=6.53$ ) show significant difference in between pre and post test means as all these calculated t-values are greater than the tabulated t-value of 2.08 at 0.05 level of confidence. From the same table it is also observed that the Control Group-C ( $t=0.165$ ) does not show significant difference because obtained t-value is less than that of tabulated t-value of 2.08 at 0.05 level of confidence.



**TABLE - 5**  
**ANALYSIS OF VARIANCE AND COVARIANCE OF SELECTED PHYSICAL FITNESS**  
**PARAMETER OF TWO EXPERIMENTAL GROUPS AND CONTROL GROUP**

	Group			Source of Variance	Mean Sum of Square	df	Mean Sum of Square	F-ratio
	Ex.Group-A	Ex.Group-B	Control Group C					
Pre-Test Mean	232.96	234.18	230.88	A	122.565	2	61.2825	0.072
				W	53414.453	63	847.848	
Post Test Mean	290.37	280.90	229.27	A	47583.802	2	23791.901	32.10*
				W	46694.227	63	741.178	
Adjusted Mean	290.12	279.61	230.80	A	44011.703	2	22005.851	181.256*
				W	7527.268	62	121.407	

\* Significant at 0.05 level

N=66; A=among group variance;

W=within group variance

tabulated  $F_{.05 (2,63)}=3.144$

tabulated  $F_{.05 (2,62)}=3.146$

Table-5 reveals that the pre-test means of three selected groups do not differ significantly as the obtained F-value of 0.072 is less than that of tabulated F-value of 3.144 for the d.f. of 2/63 at 0.05 level. It is also observed from the above table that the post-test means and adjusted means of three selected groups show significant difference because the calculated F-value of 32.10 and 181.256 are quite higher than the tabulated F-value of 3.144 and 3.146 respectively at 0.05 level of confidence. Since the adjusted mean has been found to be significant therefore Least Significant Difference Post hoc test was applied to determine the paired mean difference among the groups. It has been shown in table 14.

**TABLE - 6**  
**PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS FOR**  
**THE TWO EXPERIMENTAL GROUPS AND CONTROL GROUP IN SELECTED**  
**PHYSICAL FITNESS PARAMETERS**

Means of Group			Mean Difference	Critical Difference
Experimental Group-A	Experimental Group-B	Control Group-C		
290.12	279.61	--	10.51*	6.44
290.12	--	230.80	59.32*	6.44
--	279.61	230.80	48.81*	6.44

\* Significant at 0.05 level



It is evident from the above table that there is significantly greater improvement occurred in the Experimental Group A training in Small Playfield and Experimental Group B training in Regular Official Size Playfield while compared against the Control Group C as the adjusted final mean difference value of 59.32 and 48.81 respectively are greater than the critical difference value of 6.44 at .05 level of confidence. It is also evident that Experimental Group A has shown significant improvement than Experimental Group B as the adjusted final mean difference value of 10.51 is greater than the critical value of 6.44.

### Conclusions:

Within the limitations of the study and on the basis of statistical findings the following conclusions are drawn.

There was significant improvement in all the selected physical fitness parameters viz. Speed, Explosive leg Strength, Agility, Eye-leg Co-ordination and Cardiovascular Endurance due to the training in small playfield.

There was significant improvement in the selected physical fitness parameters viz. Speed, Explosive leg Strength and Cardiovascular Endurance due to the training in regular official size playfield but no significant improvement occurred in Agility and Eye-leg Co-ordination.

There was significantly greater improvement in physical fitness parameters as a whole to the subjects undergone training in small playfield than that of subjects belonged to training in regular official size playfield.

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