

IMPACT OF TRAINING ON PHYSICAL VARIABLES OF SOCCER PLAYERS



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Abstract:

The purpose of the study was to compare the impact of training loads on physical variables of soccer players. For this study, one hundred twenty (120) male soccer players are selected as subject. The average age of the subjects was 18-24 years as obtained for this study. Random group experimental design was employed in this study. The subjects were classified into three groups viz. endurance dominated (ED) group, strength dominated (SD) group and control (C) group; each group consisting 40 subjects. The groups were administered initial tests on physical variables. After the initial tests, the training loads were administered to the two experimental groups, where no special training was administered to the control group. The training was administered for the period of ten weeks, five days a week in progressive manner. To find out the significance of difference between pre and post –test means ‘t’ test was employed. The level of significant was set at 0.05 levels. To find out the significance of mean difference among pre – test, post- test and adjusted means, analysis of variance and co –variance techniques were employed. The result showed that there were found the significant effects of training loads on physical variables after ten weeks strength dominated and endurance dominated training programme and accepted the hypothesis stated earlier.

Keywords: Soccer, Physical variable, strength & endurance etc.

Introduction:

Soccer has become a very popular game in the world. Almost all the nations play the game both for enjoyment and competition. Modern soccer is very fast by its nature, the spectators and the players enjoy the game of soccer with a great amount of merriment. It is a game of constant action and requires continuous adaptation to changing situations by the team as a whole as well as by the individual players. The word of training methodology has crossed many milestones as a result of different types of researchers in general and their application to the sports development in particular. In the modern scientific age, athletes are being trained by highly sophisticated means for better achievement in their concerned sports. They are being exposed to the exercises and training methods which have proved beneficial for achieving higher standards. Much progress has been made in the recent years in the acquisition of knowledge about training means and techniques of sports skills. With the constant demand for “high sports performance” the concept of soccer, to date, has been changed. The concept of “Total Soccer” applies skill development, tactical development, development of all important motor components and physiological parameters which are closely associated and contributes to performance in soccer. Not only the technical, physiological and physical development, the sports scientists are also making efforts to develop the intellectual ability of the soccer players.

Methodology:

Selection of Subjects:

One hundred twenty (120) male soccer players belonging to the Public school, St. Anthony English school, Shubhaschandra Memorial English school, Thoibi quality English school in Manipur and who had participated in the inter district soccer school games, were selected as subjects for this study. The average age of the subjects was ranging between from 18 - 24 years as obtained from school records.

Selection of Test Items:

Physical Test Items: The specific motor ability test items were selected on the basis of their relevance to the game of soccer. These test items are presented below:

Muscular Strength

Leg- lift Dynamometer

Standing Broad Jump

Muscular Endurance

- i. Bent Knee Sit-up
- ii. 20 meter Shuttle Run

Design of the Study:

Random group experimental design was employed in this study. The subjects were classified into three groups viz. endurance dominated (ED) group, strength dominated (SD) group and control (C) group; each group consisting 40 subjects. The groups were administered initial tests on physical variables. After the initial tests, the training was administered to the two experimental groups, where no special training was administered to the control group. The training was administered for the period of ten weeks, five days a week in progressive manner. Detailed procedure adopted in this regard is described under the heading "Administration of Training." The final tests were re-administered on selected physical variables under similar conditions by the same testers after ten weeks.

Endurance Dominated Group (ED): For endurance dominated group the training schedules included three days of endurance training and two days were spent for the development of other components. A week's schedule was repeated for the proceeding week and there after the loads were adjusted progressive for the next proceeding block of two weeks.

Strength Dominated Group (SD): The strength dominated group also met 5 days per week. The training schedule includes three days of strength training whereas other two days were utilized for the development of other motor components. A weeks schedule was repeated for the proceeding week and thereafter the loads were adjusted progressively for the next proceeding block of two weeks.

Control Group (C): The control group was not allowed to take part in the specific experimental training programme except they had a daily 30 minute of soccer skill practices for 5-days a week for the period of 10 weeks.

Statistical Analysis:

To find out the effect of training, following statistical techniques were employed:-

- To find out the significance of difference between pre and post-test means 't' test was employed.
- To find out the significance of mean difference among pre-test, post-test and adjusted means, analysis of variance and co-variance techniques were employed.

Analysis and finding:

Its deals with the comparison of Strength dominated group, endurance dominated group and control group respectively. To observe the difference among different workload before and after the treatments on specific test items of physical variables, the analysis of co-variance (ANCOVA) was adopted and data pertaining to these have been presented in Table No- I

Table No -I
Analysis of Co-Variance of the Means of Two Experimental Groups and the Control Group in LLD

Experiment	Groups			Sum of Squares	df	Means sum of squares	F-ratio
	Strength dominated	Endurance dominated	Control Group				
Pre-test Means	87.475	88.000	87.575	A	6.217	2	3.108
				W	1593.750	117	13.622
Post-test Means	99.350	96.675	93.775	A	621.95	2	310.975
				W	1398.850	117	11.956
Adjusted post test means	99.354	96.669	93.777	A	622.277	2	311.138
				W	1398.226	116	12.054

* Significant at 0.05 level of confidence.

N=120, A=Among Means variance, W=Within Group variance,

F= Ratio needed for significance at 0.05 level of confidence: (2,117) = 3.09, (2,116) =3.09

The analysis of co-variance for LLD indicated that the resultant F-ratio of .228 was insignificant in case of pre-test means from which it is clear that the pre-test mean does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded an F-ratio of 26.010, which was significant at 0.05 level of confidence. The difference between the adjusted posts means was found significant, as obtained F-ratio was 25.813. The F-ratio needed for significance at 0.05 level of confidence was 3.09. As the difference between the adjusted means for three groups were found significant, the

critical difference for adjusted means was applied to find out which of the differences between the paired adjusted final means. The differences between the paired adjusted final means are shown in Table No II.

Table No-II

Paired Adjusted Final Means and Differences between Means for the Two Experimental Groups and Control Group in LLD

Means			Difference between Means	Critical difference for adjusted means
Strength dominated group	Endurance dominated group	Control Group		
99.354	96.669		2.685*	1.55
	96.669	93.777	2.892*	
99.354		93.777	5.577*	

* Significant at 0.05 level of confidence.

It is evident from the above Table that the significant difference was found between adjusted final mean of Strength dominated group and Endurance dominated group, Strength dominated group and Control group, Endurance dominated group and control group. The difference between means was higher than critical difference for adjusted means.

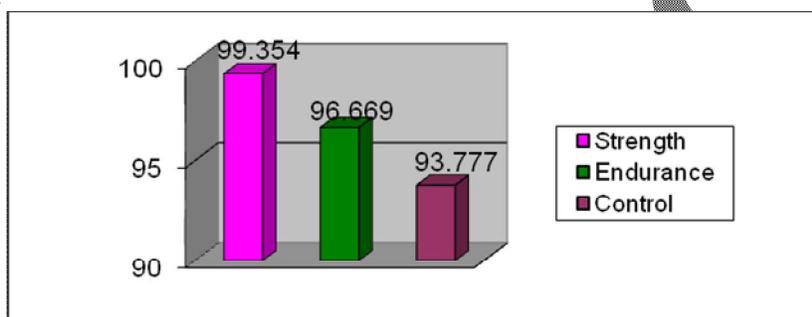


Fig. No.I. Graphical representation of LLD of adjusted means

Table No-III

Analysis of Co-Variance of the Means of Two Experimental Groups and the Control Group in SBJ

Experiment	Groups			Sum of Squares	df	Means sum of squares	F-ratio
	Strength dominated	Endurance dominated	Control Group				
Pre-test Means	2.1730	2.1777	2.1848	A	.003	2	.001
				W	2.265	117	.019
Post-test Means	2.6430	2.3260	2.2230	A	3.833	2	1.917
				W	3.598	117	.031
Adjusted post test means	2.645	2.326	2.220	A	3.916	2	1.958
				W	3.137	116	.027

* Significant at 0.05 level of confidence.

N=120, A= Among Means variance, W= Within Group variance,

F= Ratio needed for significance at 0.05 level of confidence: (2,117) = 3.09, (2,116) = 3.09

The analysis of co-variance for SBJ indicated that the resultant F-ratio of .072 was insignificant in case of pre-test means from which it is clear that the pre-test mean does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded an F-ratio of 62.332, which was significant at 0.05 level of confidence. The difference between the adjusted posts means was found significant, as obtained F-ratio was 72.407. The F-ratio needed for significance at 0.05 level of confidence was 3.09. As the difference between the adjusted means for three groups were found significant, the critical difference for adjusted means was applied to find out which of the differences between the paired adjusted final means. Differences between the paired adjusted final means are shown in Table No-IV.

Table No-IV
Paired Adjusted Final Means and Differences between Means for the Two Experimental Groups and Control Group in SBJ

Means			Difference between Means	Critical difference for adjusted means
Strength dominated group	Endurance dominated group	Control Group		
2.645	2.326		0.319*	0.073
	2.326	2.220	0.106*	
2.645		2.220	0.425*	

* Significant at 0.05 level of confidence.

It is evident from above the Table that the significant difference was found between adjusted final mean of Strength dominated group and Endurance dominated group, Strength dominated group and Control group, Endurance dominated group and Control group. The difference between means was higher than critical difference for adjusted means.

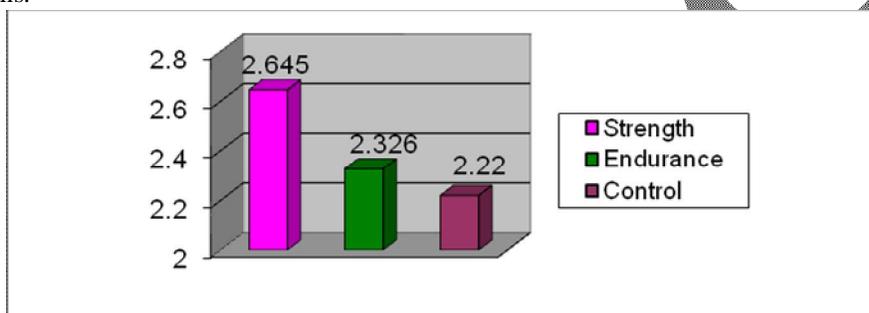


Fig.No.II Graphical representation of SBJ of adjusted means

Table No -V
Analysis of Co-Variance of the Means of Two Experimental Groups And The Control Group in BKSU

Experiment	Groups			Sum of Squares	df	Means sum of squares	F-ratio	
	Strength dominated	Endurance dominated	Control Group					
Pre-test Means	64.250	64.775	63.850	A	17.217	2	8.608	.231
				W	4357.575	117	37.244	
Post-test Means	72.675	69.875	63.850	A	1626.950	2	813.475	24.353*
				W	3908.250	117	33.404	
Adjusted post test means	72.689	69.707	64.003	A	1556.287	2	778.143	26.678*
				W	3383.457	116	29.168	

* Significant at 0.05 level of confidence.

N=120, A= Among Means variance, W= Within Group variance,

F=Ratio needed for significance at 0.05 level of confidence: (2,117) = 3.09, (2,116) = 3.09

The analysis of co-variance for BKSU indicated that the resultant F-ratio of .231 was insignificant in case of pre-test means from which it is clear that the pre-test mean does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded an F-ratio of 24.353 which was also significant at 0.05 level of confidence. The difference between the adjusted posts means was found significant as the obtained F-ratio was 26.678 The F-ratio needed for significance at 0.05 level of confidence was 3.09. As the difference between the adjusted means for three groups were found significant, the critical difference for adjusted means was applied to find out which of the differences between the paired adjusted final means. Differences between the paired adjusted final means are shown in Table No-VI.

Table No-VI
Paired Adjusted Final Means and Differences between Means for the Two Experimental Groups and Control Groups in BKSU

Means			Difference between Means	Critical difference for adjusted means
Strength dominated group	Endurance dominated group	Control Group		
72.689	69.707		2.982*	2.415
	69.707	64.003	5.704*	
72.689		64.003	8.686*	

* Significant at 0.05 level of confidence.

It is evident from above Table that significant difference was found between adjusted final mean of Strength dominated group and Endurance dominated group, Strength dominated group and control group, endurance dominated group and control group. The difference between means was higher than critical difference for adjusted means.

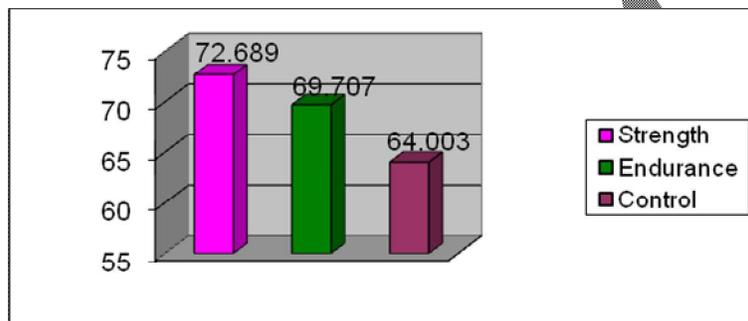


Fig.No.III. Graphical representation of BKSU of adjusted means

Table No-VII
Analysis of Co-Variance of the Means of Two Experimental Groups and the Control Groups in TMSR

Experiment	Groups			Sum of Squares		df	Means sum of squares	F-ratio
	Strength dominated	Endurance dominated	Control Group	A	W			
Pre-test Means	1.241	1.238	1.230	A	.003	2	.001	.138
				W	1.109			
Post-test Means	1.286	1.254	1.239	A	.046	2	.023	12.878*
				W	.210			
Adjusted post test means	1.286	1.254	1.240	A	.045	2	.023	12.643*
				W	.207			

* Significant at 0.05 level of confidence.

N=120, A= Among Means variance, W= Within Group variance,

F=Ratio needed for significance at 0.05 level of confidence: (2,117) = 3.09, (2,116) = 3.09

The analysis of co-variance for TMSR indicated that the resultant F-ratio of .138 was insignificant in case of pre-test means from which it is clear that the pre-test mean does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded an F-ratio of 12.878, which was also significant at 0.05 level of confidence. The difference between the adjusted post means was found significant as the obtained F-ratio was 12.643. The F-ratio needed for significance at 0.05 level of confidence was 3.09. As the difference between the adjusted means for three groups were found significant, the critical difference for adjusted means was applied to find out which of the differences between the paired adjusted final means. Differences between the paired adjusted final means are shown in Table No-VIII.

Table No-VIII
Paired Adjusted Final Means and Differences between Means for the Two Experimental Groups and Control Groups in TMSR

Means			Difference between Means	Critical difference for adjusted means
Strength dominated group	Endurance dominated group	Control Group		
1.286	1.254		0.032*	0.02
	1.254	1.240	0.014	
1.286		1.240	0.046*	

* Significant at 0.05 level of confidence.

It is evident from above Table that significant difference was found between adjusted final mean of Strength dominated group and Endurance dominated group, Strength dominated group and control group. The difference between means was higher than critical difference for adjusted means. However, the Table further reveals that there was no significant difference between the final adjusted mean of Endurance dominated Group and Control Group. The difference between means was lower than critical difference for adjusted means.

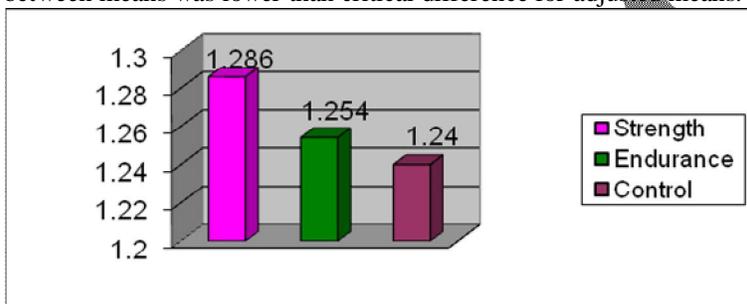


Fig.No.IV. Graphical representation of TMSR of adjusted means

Discussion on Findings:

with the comparison of pre-test and post-test of Strength dominated (SD) group, Endurance dominated (ED) group, and control (C) group by the analysis of covariance (ANCOVA) for selected items of different physical variables are discussed. Physical Test Items: In case of Leg-lift Dynamometer (LLD), it was evident from the result that there were found significant difference as the yielded F-ratio of post-test means and the adjusted post means were 26.010 and 25.813 respectively at 0.05 level of confidence (3.09). It was also evident that in the Standing Broad Jump (SBJ), there were found significant difference as the yielded F-ratio of post-test means and the adjusted post means were 62.332 and 72.407 respectively at 0.05 level of confidence (3.09). However, in both Leg-lift Dynamometer (LLD) and Standing Broad Jump (SBJ), there were found insignificant differences in case of pre-test means of the groups. In case of Bent Knee Sit-up (BKSU), it was evident from the result that there were found significant difference as the yielded F-ratio of post-test means and the adjusted post means were 24.353 and 26.678 respectively at 0.05 level of confidence (3.09). It was also evident that in the Twenty meter Shuttle Run (TMSR), there were found significant difference as the yielded F-ratio of post-test means and the adjusted post means were 12.878 and 12.643 respectively at 0.05 level of confidence (3.09). However, in both Bent Knee Sit-up (BKSU) and Twenty-meter Shuttle Run (TMSR), there were found insignificant differences in case of pre-test means of the groups.

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