STUDY OF TRAINING ON PHYSIOLOGICAL VARIABLES OF FOOTBALL PLAYERS

**Dr. Laishram Santosh Singh (NIS)[1] , Chandu G. Lamani[2] ,
Angeong Augustine Roel[3] and H. Surendra Sharma[4]**

[1]Assistant Professor, Department of Physical Education and Sports Science, Manipur University, Canchipur.

[2]Physical Education Instructor, In Charge SAC & Sports ,Research Scholar, Department of PG & Research Studies in Physical Education & Sports Science, Karnatak University, Dharwad, Karnataka, India .

[3]Research Scholar, PESS, Manipur University.

[4]Research Scholar, PESS, Manipur University.

ABSTRACT: -

The purpose of the study was to compare the impact of training loads on physical and physiological variables of soccer players. For this study, one hundred twenty (120) male football 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 physiological 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 physiological variables after ten weeks strength dominated and endurance dominated training programme and accepted the hypothesis stated earlier.

KEYWORDS: *Football, Physiological variable, strength, endurance, etc.*

INTRODUCTION :

Modern football is very fast by its nature, the spectators and the players enjoy the game of football 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. With the constant demand for "high sports performance" the concept of football, to date, has been changed. The concept of "Total football" 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 development, the sports scientists are also making efforts to develop the intellectual ability of the

football players. The existing literature in the field of soccer shows that endurance, speed, agility, maximum leg strength, upper body strength, leg power, muscular endurance, flexibility, coordination and reaction time are important pre requisites for efficient football performance.

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.

METHODOLOGY

Selection of Subjects: One hundred twenty (120) male football 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 football 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

Physiological Test Items: The following physiological test items were selected in relation to standard of football players.
1. Resting Heart Rate: Measure of Resting Heart Rate by Pulpatory Method
2. Vital Capacity: Measure of Vital Capacity by using Wet Spirometer.

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 physiological 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. Detailed procedure adopted in this regard is described under the heading "Administration of Training." The final tests were re – administered on selected physiological variables under similar conditions by the same testers after ten weeks.

ADMINISTRATION OF TRAINING

The training for both the experimental groups was administered at the Shubhaschandra Memorial English School Sports Complex. The experimental groups met 5 days per week for the period of ten weeks. Each experimental session was of 60 – minute's duration with additional 30 minutes was made available for all the groups for football soccer skill practice. The training commenced with first two weeks of General Physical Condition for both the experimental groups, so that; physiological systems of subjects were ready to undertake specific load administered to them for the purpose of the study. After the conditioning the training was administered separately for the two experimental groups and details of which are as follows:

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 football 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.
1. To find out the significance of difference between pre and post –test means't' test was employed.
2. 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 physiological variables, the analysis of co-variance (ANCOVA) was adopted and data pertaining to these have been presented in

Table- 1: Analysis of Co-Variance of the Means of Two Experimental Groups And The Control Groups in RHR

Experiment	Groups			Sum of Squares		df	Means sum of squares	F-ratio
	Strength dominated	Endurance dominated	Control Group					
Pre-test Means	64.225	66.225	65.375	A	80.600	2	40.300	1.735
				W	2717.325	117	23.225	
Post-test Means	62.025	64.075	65.050	A	190.717	2	95.358	4.164*
				W	2679.650	117	22.903	
Adjusted post test means	62.984	63.207	64.959	A	93.449	2	46.725	13.157*
				W	411.956	116	3.551	

* 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 RHR indicated that the resultant   F-ratio of 1.735 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 4.164, 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 13.157. 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 II.

Table – II: Paired Adjusted Final Means and Differences between Means for the Two Experimental Groups and Control Groups in RHR

Means			Difference between Means	Critical difference for adjusted means
Strength dominated group	Endurance dominated group	Control Group		
62.984	63.207		0.223	
	63.207	64.959	1.752*	0.842
62.984		64.959	1.975*	

* Significant at 0.05 level of confidence.

✦ It is evident from above Table that significant difference was found between adjusted final means of endurance dominated group and control group, Strength dominated group and control group.

✦ The difference between means was higher than critical difference for adjusted means. On the other hand, insignificant difference was found between the adjusted final means of endurance dominated group and control group, Strength dominated group and control group.

✦ The difference between means was lower than critical difference for adjusted mean.
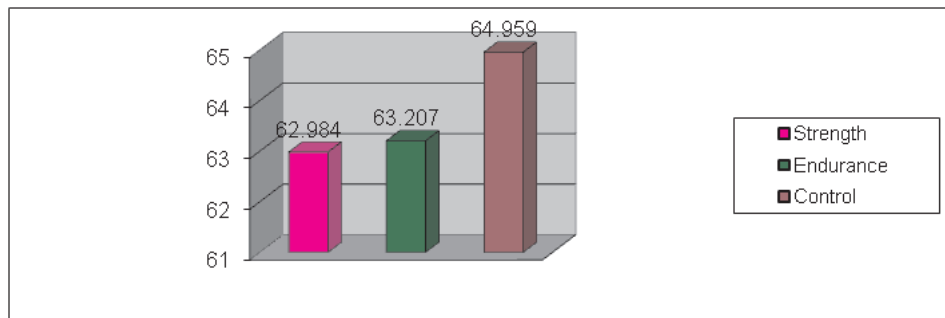
Fig.No.1. Graphical representation of RHR   of adjusted means

Table-III:Analysis of Co-Variance of the Means of Two Experimental Groups and the Control Groups in VC

Experiment	Groups			Sum of Squares		df	Means sum of squares	F-ratio
	Strength dominated	Endurance dominated	Control Group					
Pre-test Means	3.629	3.555	3.565	A	.129	2	.064	.971
				W	7.766	117	.066	
Post-test Means	3.790	3.780	3.5450	A	1.538	2	.769	12.498*
				W	7.199	117	.062	
Adjusted post test means	3.757	3.800	3.558	A	1.335	2	.667	23.91*
				W	3.238	116	.028	

* 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 VC indicated that the resultant ratio of .971 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 12.498, 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 23.910. 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 4.

Table – IV: Paired Adjusted Final Means and Differences between Means for the Two Experimental Groups and Control Groups in VC

Means			Difference between Means	Critical difference for adjusted means
Strength dominated group	Endurance dominated group	Control Group		
3.757	3.800		0.043	
	3.800	3.558	0.242*	0.236
3.757		3.558	0.199	

* Significant at 0.05 level of confidence.

✦ It is evident from above Table that significant difference was found between adjusted final mean of endurance dominated group and control group.
✦ The difference between means was higher than critical difference for adjusted mean. On the other hand, insignificant difference was found between the adjusted final means of Strength dominated group and Endurance dominated group, Strength dominated group and control group.
✦ The difference between means was lower than critical difference for adjusted mean.
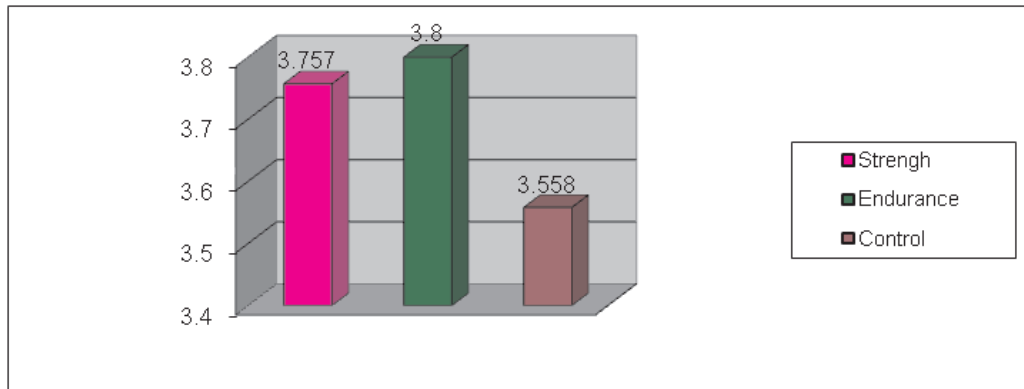
Fig.No.2.Graphical representation of VC   of adjusted means

DISCUSSION OF FINDINGS

In this Section, 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 test items of different physiological variables are discussed.

Physiological Test Items: In case of Resting Heart Rate (RH), 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 4.164 and 13.157 respectively. It was also evident that in the Vital Capacity (VC), there were found significant difference as the yielded F-ratio of post-test means and the adjusted post means were 12.498 and 23.910 respectively.

Discussion of Hypothesis: There were found the significant effects of training loads on the selected physiological variables after ten weeks strength dominated and endurance dominated training programme and accepted the

hypothesis stated earlier.

CONCLUSION & PRACTICAL APPLICATION

It was found that the significant effects of training loads on the selected physical and physiological variables after ten weeks speed dominated and strength dominated training programme and accepted the hypothesis stated earlier.

RECOMMENDATION FOR FUTURE RESEARCH WORK

Extensive research have been undertaken in several sports disciplines to identify Physiological and Motor fitness characteristics of young sports children which enables coaches to identify promising talent in their respective sports disciplines. However, no research is traceable which identify physiological and other characteristics of young football players.

• Therefore it is recommended to undertake research which might identify the, physiological, Motor Fitness profiles of young football from normal population or other sporting population.

• In the present study sample size of young football was very small. Therefore, it is recommended to replicate such an investigation with larger sample size.

• Within each sports disciplines the demands placed on various specialists differs. Therefore Investigation of physiological and motor fitness profiles of football specializing in striker, defender, and goal keeper is recommended.

• The present investigation involved football players at state level. The physiological and motor fitness profile at national and international level may be accentuated for various reasons. Therefore an investigation involving football of national and international repute may be undertaken.

RECOMMENDATION FOR COACHES AND ADMINISTRATORS

• It is recommended that either training regime be made demanding or select candidates with suitable physiological and motor fitness.

• Based on the research findings involving young children in sports, identify talented cricketers at early age and coach them right.

• It is recommended that coaches based on their knowledge of physiological and motor fitness profile required for various departments of the game of football.

REFERENCE:

1. Arpad Csanadi, Soccer, (Hungary: Athenacum Printing House, 1978), p.446.

2. Ming Kai Chin et.al. "Cardio respiratory Fitness and Isokinetic Muscle Strength of Elite Asian Junior Soccer players." Journal of Sports Medicine Physical Fitness, Vol.34, No3,(September 1994):pp.250-257.

3. J.L. Bhanot, "Maximal Anaerobic Power of Indian Soccer Players According to Playing Position." Research Center in Physical Education and Sports, (Dept. of Human Biology, Punjab Unversity, Patiala, India), (Cited by T. Reilly et.al. Science and Football, (London: E. & F., N. Spon 1988), p.172.

4. Jasem Mohammed Eramadan, "Selected Physiological, Psychological and Anthropometric characteristics of the Kuwaiti World Cup Soccer Team," Dissertation Abstracts International, Vol.46, No.4, (October 1985): 924-A

5. Jasem Ramadam and Ronald Byrd, "Physical Characteristics of EliteSoccer Players," Journal of Sport Medicine and Physical Fitness," Vol. 27, No.4(December1987):pp.424-427.

6.Bill Jack Talton, "An Investigation of Selected Physical and Physiological Assessment as predictors of successful High School Football performance," DissertationAbstracts International, vol.33 (August 1973): 609-A.

7.William H. Freeman, Physical Education and Sports in Changing Society, and Ed., (Delhi: Surjeet Publication.1982).

8.Tommy Docherty, Better Football, (Delhi: Vision Book Private Ltd., 1980),

9.Beim, George, Principles of Modern Soccer. London: Houghton Mifflin Company, 1977.

10.Emily Haynes, et.al., "Aerobic capacity, Strength and Power differences between Male and Female Athletes,"

Abstracts of Research Paper AAHPER Convention (1981): 130.

11.Sergej M. Ostojic, "Physical and Physiological Characteristics of Elite Serbian Soccer Players," Physical Education and Sport, Vol.1, No.7, (2000): pp.23-29.

12.Ulrik Wisloff, Jan Helgerud and Jan Hoff, "Strength and Endurance of Elite Soccer Players," Medicine and Science in sports and Exercise, Vol.30, No.3 (March 1998): 462-467.

13.Christine, et.al., "Body Composition and Aerobic Requirements of male and female Marathon Runners," Abstract of Research Paper AAHPER Convention (1980):22

Dr. Laishram Santosh Singh

Assistant Professor, Department of Physical Education and Sports Science, Manipur University , Canchipur.