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# Analysis of adjustment and vital-capacity among different levels of participation of endurance runners

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**Purpose:** The study is trying to find out the difference among the National, Inter-University and State Level endurance runners in order to provide information about the potential effects of psychological and physiological variables.

**Design/Methodology/Approach:** The one fifty (n= 150) endurance runners participating at state/ inter-university and national level competitions of their age range 18 to 25 years were randomly selected as subjects from national, State and Inter-University camps of mostly North East States of India. The adjustment of the endurance runners measured by Prof. A.K.P. Sinha & Dr. R.P. Singh (1980) test and Vital Capacity by Dry Spirometer test of National, Inter-University and State Level endurance runners. To calculate the mean difference among different level of endurance runners mean, SD, ANOVA and Post-hoc test were conducted by using SPSS 11.5 computer software.

**Findings:** A statistical finding of the Inter-University level runners have been found to possess more level of adjustment than those of the National and State level runners, but state level runners has the least adjustment and in case of physiological variables Inter-University level runners possess similar vital capacity but the state level runners possess the least capacity among the groups.

**Conclusion:** Inter-University level endurance runners have more adjustment whereas state level runners show least adjustment level but National and Inter-University level runners have similar but higher vital capacity and state level runners have lower vital capacity.

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*Keyword:* Adjustment, vital capacity, endurance runners and different levels

### Introduction

In the 21<sup>st</sup> century sports world, new records are being established day by day & sports persons are bringing laurels for their countries in various competitions at international level. This is so because the continued development of science and technology and their application to the field of sports & physical education has enabled modern youth to develop physical capabilities

beyond anything earlier imagined. Sports is now no more a hobby, it has become a full time profession. Modern sports, in fact compel athletes to take up sports competition as a full time vocation besides making name and fame. So, the sports scientists and coaches demand full time involvement and round the year dedicated practice of sportsmen to reach the pinnacle of their performance. The international community

of sports lovers is also curiously looking for better and superb performance of sportsmen and sportswomen in their respective fields. Aspiration & expectations of the people pertaining to the performance of sportsmen all over the world are going higher & higher. The high level of performance by sportsmen & sportswomen require a highly scientific approach and it should be done right from the level of identifying talents.

### **Adjustment**

Adjustment is a process by which an individual adjusts in external surroundings. A person is said to be adjusted when he is mentally sound and who seems to be happy in every activity of his daily life. One tries one's best in life for his mental satisfaction. How much success he gets out of it depends on the norms decided by society with a comparison of the achievement of others. Due to individual differences, some persons are able to adjust themselves at a fast changing pace of life and some find great difficulty to accept the surrounding things and become mal adjusted. This process of adjustment starts right from one's birth. Man, among living beings, has the highest capacity to adapt to new situations. Man is a social animal not only adapted to social demands but also to the social pressures.

A well-adjusted person possesses an adequate level of aspirations. He respects himself and also the self of others. He is aware of his own strength and limits. There is more or less flexibility in his behavior so that he can easily adjust himself in changed circumstances by making necessary amends in his behavior.

### **Physiological Variables**

The physiology of exercise, in particular, sports physiology, is not a very old subject. It is, however, growing very rapidly now, and one of the probable reasons for its rapid growth is the patronage it receives from the state and society. The state and society hope that development of sports physiology in the country can help in enhancing its reputation not only in the field of sports but in other fields also. Modern sports have, indeed, become very demanding because of the fierce competitions involved.

### **Vital Capacity**

While breathing we alternately take into and expel a certain quantity of air from the lungs. With each quiet inspiration about 30 cubic inches of air enters the lungs, and 30 cubic inches come out along with each expiration. The air, thus, going into and coming out of the lungs is called tidal air. After an ordinary inspiration, the lungs contain about 230 cubic inches of air. By taking a deep inspiration, about 100 cubic inches more can be taken in. This extra amount is called complemental air.

After an ordinary expiration, about 200 cubic inches are left in the lungs, but by forced expiration about one-half of this may be driven out. This is known as supplemental air. The lungs can never be entirely emptied of air and about 75 to 100 cubic inches of air always remains inside. This is known as the residual air.

The investigator being an Inter-University/State/National long distance runner has undertaken the study to investigate the psychological, and physiological variables of endurance runners to know the effects of these variables on the running performance of female students.

### **Selection of Subjects**

For the purpose of the present study, one fifty (n=150) endurance runners participated at state (50)/inter-university(50) and national(50) level competitions of their age range 18 to 25 years were randomly selected as subjects from national and Inter-University camps of mostly North East States of India.

### **Selection of Variables**

#### **Psychological Variables**

Adjustment

#### **Physiological Variable**

Vital Capacity

To assess the Adjustment, Adjustment Inventory developed by Prof. A.K.P. Sinha & Dr. R.P. Singh (1980) <sup>[19]</sup> was used. Dry Spirometer was used to measure vital capacity.

**Statistical Technique Employed:** The data were analyzed by applying mean differences among different levels of endurance runners. SD, ANOVA and Post-hoc tests were conducted with the help of Statistical Package for the Social Science (11.5) computer software.

**Results and Discussion**

It is revealed from table-1 that the calculated value of F- (610.189) was found more than the table value of F-(4.75) at .01 level and hence was significant. It shows that the three different groups of endurance runners at different levels of participation had different level of adjustment.

Further to know the pairwise mean difference, the Least Significant Difference method was applied as presented in the following table.

Table-1 shows that there were significant differences in means of vital capacity among elite endurance runners at national, interuniversity and state levels as the calculated value of F-(6.92) was found more than the table value of F-(4.75) and hence was significant at .01 level of confidence. It shows that the three groups of endurance runners have different vital capacities. The Least Significant Difference method was applied to know the pairwise difference among the groups.

**Table 1:** Analysis of adjustment and vital-capacity among endurance runners at different levels of participation

Name of the Variables	Source of variance	Df	TSS	MSS	F-ratio
Adjustment	Between groups	2	8681.29	4340.647	610.189
	Within groups	147	1045.70	7.11	
	Total	149	9726.99		
Vital-Capacity	Between groups	2	773049.65	386524.82	6.92**
	Within groups	147	8211407.52	55859.91	
	Total	149	8984457.173		

Significant at .05 level of confidence .01= 3.06  
Significance at .01 level of confidence .01 = 4.75

**Table 2:** Significant difference in means among adjustment and vital-capacity of endurance runners at different levels of participation

Name of the Variables	National	Inter Uni.	State	Mean Diff.	CD
Adjustment	35.40	36.68	-----	01.28**	1.038
	35.40	-----	19.94	15.46**	
	-----	36.68	19.94	16.74**	
Vital-Capacity	2740.36	2664.00	-----	76.30	92.62
	2740.36	-----	2565.00	175.36*	
	-----	2664.00	2565.00	99.00*	

Table-2 shows that the difference in mean adjustment scores between inter university vs national (1.280), inter varsity vs state (16.74) and national vs state (15.46) were found more than the critical difference (1.038) at .01 level. It suggests that inter varsity level endurance runners had more adjustment level than those of the national and state level runners at different levels of participation but the state level runners had least adjustment among the groups of endurance runners.

From the table-2, it is observed that the differences in means of vital capacity between

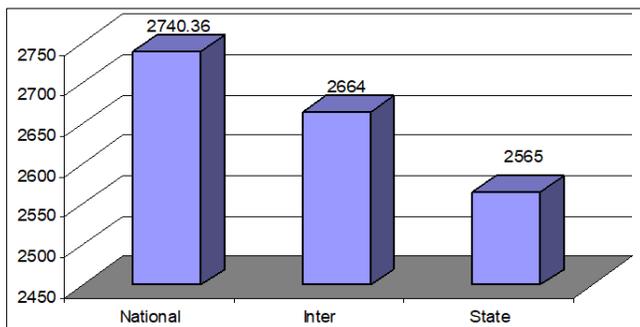
national vs state (175.36cc) and interuniversity vs state and (99.00cc) level runners were found more than the critical difference (92,62cc) and the difference in means of vital capacity between national and inter varsity (76.30cc) was found less than the critical difference (92,62cc) as shown in the figure-26. It suggests that national and inter varsity level runners have statistically similar vital capacity but the state level runners have the minimum vital capacity among the groups of runners.

**Result Discussion:** In the light of the interpretations of the results of the present study already discussed in the previous chapter, the following findings are Stated as:-

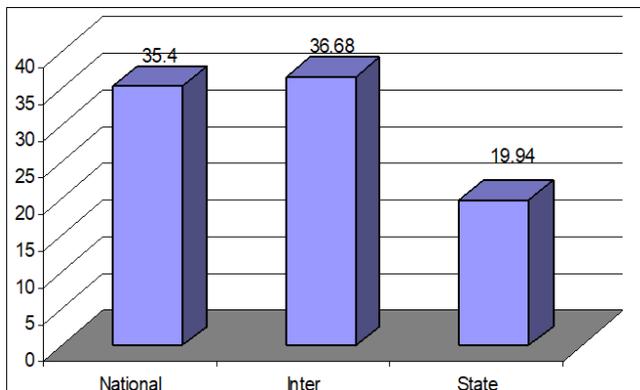
Further it is found that Inter-University level runners have been found to possess more level of adjustment than those of the National and State level runners, but state level runners have the least adjustment.

Further National and Inter-University level runners possess similar vital capacity but the state level runners possess the least capacity among the groups.

The results of the study are inconsistent with the studies conducted by other scientist i.e. Usha Rani (2004)<sup>[17]</sup>, Ramchander (2009)<sup>[18]</sup>



**Fig 1:** Significant difference in means among vital-capacity of endurance runners at different levels of participation



**Fig 2:** Significant difference in means among adjustment of endurance runners at different levels of participation

**Conclusion**

1. Inter-University level endurance runners have more adjustment whereas state level runners show least adjustment level.

2. National and Inter-University level runners have similar but higher vital capacity and state level runners have lower vital capacity.

**Suggestion**

1. The results of the study may be helpful for the self-evaluation of the players of various games and sports.
2. Congenial and suitable atmosphere may be created in schools and colleges for mass participation of female students in sports activities.
3. The study may be helpful for coaches and teachers to solve physiological and psychological problems of female players.

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