



## INFLUENCE OF DIFFERENT ALTITUDES ON SPEED PERFORMANCE AMONG HIGH SCHOOL PLAYERS IN TAMIL NADU

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### Abstract

The investigator made an attempt to determine the influence of different altitudes on speed performance among high school players in Tamil Nadu. Forty five ( $n = 45$ ) high school girl players of different sports was selected as subjects from different regions such as coastal, plain and high altitude at random. The age group of the subjects ranged between 14 and 18 years. Speed was selected as the criterion variable and that was measured by using 50 mts. run. The collected data was statistically analysed by using analysis of variance (ANOVA) and Scheffe's test was applied as a post hoc test to determine the significant differences between the mean. The result of the study showed that there was a significant difference ( $p \leq 0.05$ ) in speed performance between the coast and high altitude and plain and high altitude. Results also showed that, the coastal and plain altitude players are better in speed than high altitude players.

**Key Words:** Coastal area, high altitude, female players, speed.

### Introduction

The term altitude is commonly used to mean the height above sea level of a location in geography. The people live in the hills may change when compare the people live in coastal and plain (Fleishman, 1963). Tamil Nadu is one of the Southern State of India; having different geographical region such as coastal, plain and altitude. In that different area people are survived and their lifestyle also changes according to their environment. People who live in coastal regions may suffer the cumulative burden of environmental stress from the activities on and overcrowding of the coast and from upstream and inland development (Baracco *et al.*, 2007). As altitude increases, air temperature and pressure decrease and there is less oxygen available for aerobic activities. This lack of oxygen can severely limit the physical performance of endurance athletes and climbers, particularly those accustomed to living at lower altitudes (Pidwirny. 2006). The thin air, however, offers less resistance to sprinters and jumpers, so it is generally easier to perform these activities at high altitude than at sea level.

Muscles are made up of a combination of fast-switch and slow-switch fibers. Fast-switch fibers contract rapidly and slow-switch fibers contract more slowly and with lower level of force. If all other things are equal, athletes with longest muscle fibers and greater percentage of fast switch fiber should have the ability to run faster (Jarver, 1978) than an athlete with shorter slow -switch fibers. Speed is the product of two factors, stride length and stride frequency. Increasing either factor automatically increases a runners sprinting speed (Clarke & Clarke, 1987). Stride frequency is an inborn quality; it might be possible to improve it slightly through training. But the stride length can be increased by increasing the leg strength

and power (Eicher, 1975). Hence the investigator made an attempt to determine the physical fitness component such as speed of female students at different altitudes.

**Methodology**

Forty five ( $n = 45$ ) female high school players of different sports such as hockey ( $n = 12$ ), handball ( $n = 11$ ), volleyball ( $n = 10$ ) and cricket ( $n = 12$ ) were selected as subjects for this study from different regions such as coastal, plain and high altitude at random. Fifteen players ( $n = 15$ ) were selected from each region and their age ranged between 14 and 18 years. Speed was selected as the criterion variable and that was measured by using 50 mts. run. The obtained data from the variable were statistically analysed with one-way analysis of variance (ANOVA). Whenever the  $F$  ratio was found to be significant, Scheffe’s test was applied as a post hoc test to determine the mean differences. The level of confidence was fixed at 0.05 levels of all the cases to find out the significance.

**Results and Discussion**

Table – I

**Analysis of Variance of the Coastal, Plain and High Altitude of Speed**

Mean			SOV	Sum of Squares	df	Mean Squares	F Ratio
Coastal	Plain	High Altitude					
8.93	9.03	9.76	Between	6.13	2	3.06	15.04*
			Within	8.56	42	0.20	

\* Significant  $F = (2, 42) (0.05) = 3.22, p \leq 0.05$

From the table-I, the mean values of the speed of coastal, plain and high altitude are 8.93, 9.03 and 9.76 respectively. The obtained  $F$  ratio of 15.04 is greater than the table value of 3.22 required for significant at 0.05 level of confidence.

The results of the study indicate that there is a significant difference between the mean of coastal, plain and high altitude atmosphere on speed. To determine which of the mean had a significant difference, Scheffe’s test was applied as a post-hoc test and the results are presented in table-II.

Table – II

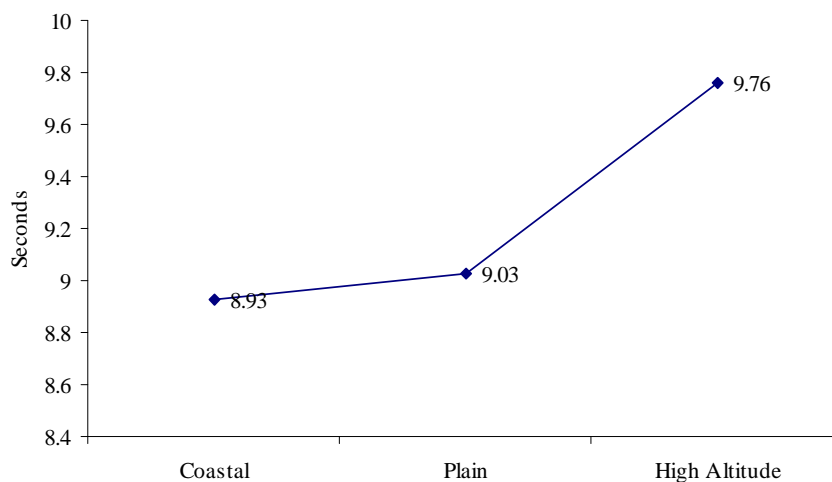
**Scheffe’s Test for the Difference between the Mean of Coastal, Plain and High Altitude of Speed**

Mean			Mean Difference	Confidence Interval (C.I)
Coastal	Plain	High Altitude		
8.93	9.03		0.1	0.41
8.93		9.76	0.83*	
	9.03	9.76	0.73*	

\* Significant,  $p \leq 0.05$

Table-II shows the mean difference in speed between the coastal and high altitude and plain and high altitude are 0.83 and 0.73 respectively. These values are higher than the required confidence interval value 0.41, which shows significant difference at the 0.05 level of confidence. However the mean difference in speed between coastal and plain atmosphere is 0.1. This value is lesser than the confidence interval value of 0.41, which shows there was no significant difference at 0.05 levels.

The changing global socioeconomic environment over the last two decades had significant ramification for the health and development of youth in lower and middle income countries (Phongsavan, 2005). Different altitude life style and characters play a role to maintain motor fitness especially the speed of teenage girl students. Teenage is a prime phase of growth and development. Lifestyle and behaviors are established during these years, which may influence adult behavior and health status (Ortega *et al.*, 2008). The physical development motor performance and health related fitness are the most important aspect to be understood thoroughly by every physical education and sports professionals. The outcome of physical literacy is as important to children’s education development as numeric and literacy. Positive features distinguishing physical education, and the role of initial training and professional development in preparing a life (Alfred *et al.*, 2003). The result of the study indicated that the coastal and plain area girl players were better in speed performance than high altitude area girl players. The mean values of speed of different altitudes such as coastal, plain and high altitude are graphically presented in figure 1.



**Figure 1: The mean values of speed at altitudes such as coastal, plain and high altitude**

**Conclusion**

High altitude acclimatization consists of a number of reversible physical adaptations. These enable the body to cope with low oxygen level. This study we can see the variable; speed at different altitude such as a coastal area, plain area and high altitude area. The result of the

study concluded that there was a significant difference between the speed of coastal and high altitude atmosphere and plain and high altitude atmosphere. However there was no significant difference between coastal and plain areas on speed performance. So that from the result we can say the coastal and plain area is the best atmospheres to improve speed performances for high school girl students.

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