



## COMPARATIVE ANALYSIS OF SELECTED PHYSICAL AND PHYSIOLOGICAL VARIABLES AMONG SPRINTERS MIDDLE AND LONG DISTANCE RUNNERS

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### Abstract

The purpose of the study was to analyse the selected physical and physiological variables namely leg strength and breath holding time among sprinters, middle distance runners and long distance runners. To achieve this purpose of the study, sixty men athletes were selected from the Department of Physical education Annamalai University Annamalai nagar Chidambaram India. Among them, twenty sprinters, twenty middle distance runners and twenty long distance runners were selected as subjects. The age of subjects were ranged between 19 to 22 years. The following physical and physiological variables namely leg strength and breath holding time were selected as variables. The data were collected for all the three groups such as among sprinters, middle distance runners and long distance runners. The data were collected for all subjects by using standardized test items. The one way analysis of variance was used to find out the significant difference among sprinters, middle distance runners and long distance runners on selected criterion variables. The Scheffe's test was used as a post hoc test to find out the paired mean differences, if any. In all cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. The results of the study showed that there was a significant difference among sprinters, middle distance runners and long distance runners on leg strength and breath holding time.

**Keywords:** Leg strength and breath holding time.

### INTRODUCTION

The word physical refers to the body. It is often used in reference to various bodily characteristics such as physical strength, physical development, physical powers, physical health, and physical appearance. It refers to the body as contrasted to the mind. Therefore, when you add the word education to the word physical and use the words physical education, you are referring to the process of education that concerns activities that develop and maintain the human body.

### METHODOLOGY

The purpose of the study was to analyse the selected physical and physiological variables namely leg strength and breath holding time among sprinters, middle distance runners and long distance runners. To achieve this purpose of the study, sixty men athletes were selected from Annamalai University. Among them, twenty sprinters, twenty middle distance runners and twenty long distance runners were selected as subjects. The age of subjects were ranged between 19 to 22 years.

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### ANALYSIS OF THE DATA

#### LEG STRENGTH

The mean, standard deviation and 'F' ratio values on leg strength among sprinters, middle distance runners and long distance runners have been presented in Table I.

**TABLE I**  
**THE MEAN, STANDARD DEVIATION AND 'F' RATIO VALUES ON LEG STRENGTH AMONG SPRINTERS, MIDDLE DISTANCE RUNNERS AND LONG DISTANCE RUNNERS**

Groups	Mean	Standard Deviation	Obtained 'F' Ratio
Sprinters	91.33	1.18	5.21*
Middle Distance Runners	90.83	1.20	
Long Distance Runners	92.69	1.02	

\* Significant at .05 level of confidence.

(The table value required for significance with df 2 and 57 was 3.162 )

Table I shows that the mean values on leg strength of sprinters, middle distance runners and long distance runners were 91.33, 90.83 and 92.69 respectively. The obtained 'F' ratio 5.21 was greater than the table value 3.162 required for significance with df 57. The results of the study showed that there was a

significant difference on leg strength among sprinters, middle distance runners and long distance runners. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table II.

**TABLE II**  
**THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN PAIRED MEANS ON LEG STRENGTH**

Sprinters	Middle Distance Runners	Long Distance Runners	Mean Differences	Confidence Interval Value
91.33	90.83	-	0.50*	0.233
91.33	-	92.69	1.36*	0.233
-	90.83	92.69	1.80*	0.233

\* Significant at .05 level of confidence.

The table II shows that the mean difference values between sprinters and middle distance runners, sprinters and long distance runners and middle distance runners and long distance runners 0.50, 1.36 and 1.80 which were greater than the required confidence interval value 0.233 on leg strength. The results of this study showed that there was a significant difference exists between sprinters and middle distance runners, sprinters

and long distance runners and middle distance runners and long distance runners on leg strength.

#### **BREATH HOLDING TIME**

The mean, standard deviation and 'F' ratio values on breath holding time among sprinters, middle distance runners and long distance runners have been presented in Table III.

**TABLE III**  
**THE MEAN, STANDARD DEVIATION AND 'F' RATIO VALUES ON BREATH HOLDING TIME AMONG SPRINTERS, MIDDLE DISTANCE RUNNERS AND LONG DISTANCE RUNNERS**

Groups	Mean	Standard Deviation	Obtained 'F' Ratio
Sprinters	28.34	1.17	4.39*
Middle Distance Runners	32.03	1.68	
Long Distance Runners	29.34	1.78	

\* Significant at .05 level of confidence.

(The table value required for significance with df 2 and 57 was 3.162)

Table III shows that the mean values on breath holding time of sprinters, middle distance runners and long distance runners were 28.34, 32.03 and 29.34 respectively. The obtained 'F' ratio 4.39 was greater than the table value 3.162 required for significance with df 57. The results of the study showed that there was a

significant difference on breath holding time among sprinters, middle distance runners and long distance runners. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table IV.

**TABLE IV**  
**THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN PAIRED MEANS ON BREATH HOLDING TIME**

Sprinters	Middle Distance Runners	Long Distance Runners	Mean Differences	Confidence Interval Value
28.34	32.03	-	3.69*	0.871
28.34	-	29.34	1.00*	0.871
-	32.03	29.34	2.69*	0.871

\* Significant at .05 level of confidence.

The table IV shows that the mean difference values between sprinters and middle distance runners, sprinters and long distance runners and middle distance runners and long distance runners 3.69, 1.00 and 2.69 which were greater than the required confidence interval value 0.871 on breath holding time. The results of this study showed that there was a significant difference exists between sprinters and middle distance runners, sprinters and long distance runners and middle distance runners and long distance runners on breath holding time.

#### CONCLUSIONS

1. There was a significant difference on leg strength among sprinters, middle distance runners and long distance runners.
2. There was a significant difference on breath holding time among sprinters, middle distance runners and long distance runners.

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