



# Comparative Study of some Selected Physiological Variables among Intercollegiate Level Athletes

Dr Suneeta Devi Associate Professor Enlightened College of Physical Education Jhunir Mansa  
Punjab

## Abstract:

Objective of the study was to compare physiological variables of athletes participated in different track events viz. short, middle and long distance at Punjab University Intercollegiate competition held at Panjab University Campus at 2018-19. 120 athletes i.e. 40 short, 40 middle and 40 long distance were selected by using simple random sampling method. AAPER youth physical fitness test was used for collection of data. Mean Median, SD, SEM, t test and one way analysis of variance AANOVA was used for analysis of collected data. Results of study show valuable facts which can help athletes and coaches for their further training.

**Key Words:** Physiological Variables, intercollegiate, athlete

## Introduction:

Now-a-days physical activities have become part and parcel of human life. Many people participate in sports and games for fun and enjoyment. Enjoyment and maintaining health and fitness have increased participation in sports and games, and give rise to various forms of competitions. Competition provides the means by which one can show one's worth by competing regularly. All sportsman and team try to show their supremacy over each other in sports competitions. Each and every country develops its own innovations in techniques, tactics and strategies for exhibiting top level performance, so as to emerge winners and champions of the world.

In competitive sports, for the selection of a particular sports, one has to consider measures of human body and the physical fitness which play a dominant role at higher level of sports competitions. Scientists and physiologists have been of the view that anthropometry and physical components of an athlete have a lot to do with the performance, more than the techniques and tactics of a player of a team. The research findings show that a high level of technical perfection alone has nothing to do with the success in competitive sports. Most of the game demand a greater amount of speed, strength, endurance, flexibility, co-ordination and maximum fitness of the organism Training of an athlete must start from young age, it means selection must be made at the school level. The potential athlete should be selected on the basis of physiological and morphological characteristics and for different

**Chantal et al.** conducted the present investigation was to proceed to a multi dimensional analysis of sport motivation in relation with elite performance and gender. The sample was made up of 98 Bulgarian top athletes (35 females and 63 males). Participation athletic performances in national and international events over the last two years was documented. Participants also completed the Bulgarian version of the sport motivation scale, The SMS, which is based on the tenets of self determination theory (Deci and Ryan, 1985, 1991) assess; intrinsic motivation, self determined extrinsic motivation, non self determined extrinsic motivation and a motivation. Results indicated that, in comparison with less success athletes, title and medal holders displayed higher levels of non self determined extrinsic motivation and higher levels of motivation with respect to gender, the motivation of female athletes was more strongly characterized by

intrinsic motivation, Results are discussed in light of self determination theory and the cultural context which prevailed in Bulgaria at the time of the investigations. It is concluded that these highlight the role of motivation in elite sport performance. Sports event should be given proper extensive training by the experienced coaches over prolonged periods.

The efficient coach provides his or her athlete with a grasp of strategy, a physiological environment conducive to model level of performance, a means of learning skill and proper course of training. Modern scientific methods of training players or team place greater responsibility on the coaches and physical educators. They are also responsible for the selection of team taking into consideration the physical and physiological qualities essential for the game.

### **Statement of the Problem**

The purpose of the study was to compare the Physiological Variables among the Athletes of Different Event

### **Delimitations**

- I. The study was delimited to the female athletes of Track events of Collegiate level.
- II. The study was delimited to physiological variables.

### **Limitations**

1. Personal habits of subjects and their state of mind as well as emotional stresses and strains and other factors which may have effected on the result of this study could not be controlled was to be considered as the limitation of the study.
2. Certain factors like diet, daily routine habits, facilities, training, geographic conditions etc. that may effect on the results of the study was considered as the limitation of the study.

### **Hypothesis**

It was hypothesized that there will be no significant differences between Physiological variables among different track events.

### **Selection of Subjects**

The present study was conducted on one hundred and twenty athletes from All India Inter varsity Athletic championship (40 sprinters, 40 middle distance runners and 40 long distance runners of various Universities of Maharashtra. The age of the subjects ranged from 18 to 25 years.

Following variables were selected for the purpose of this study:

#### **Physiological Variables**

1. Anaerobic Power/Capacity
2. Resting heart rate
3. Resting respiratory rate
4. Body composition
5. Total body fat percentageLean body weight
6. Breath Holding Capacity Negative breath holding capacityPositive breath holding capacity

#### **Collection of Data:**

- 1) Anaerobic Power/Capacity is measure by using Wingate Anaerobic Test (WG)
- 2) Resting Heart Rate: is measured with stethoscope
- 3) Resting Respiratory Rate: Stop Watch
- 4) Body Composition: Weighing machine and stadiometer.
- 5) Total Body Fat: Skin-fold caliper
- 6) Lean Body Weight Calculating Body fat percentage

- 7) Breath Holding Capacity Stop watch  
(Positive and Negative)

### Statistical Techniques

**Table - 1**

**Analysis of Variance of anaerobic power among Sprinters, Middledistance and Long distance runners**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	28.297	2	14.148	0.212	0.809
Within Groups	7792.558	117	66.603		
Total	7820.855	119			

Tabulated 'F'= 3.07 (2,117) at 0.05 level of significance

The above table reveals that no significant difference was found in case anaerobic power among **Sprinters, Middle distance and Long distance runners** as the obtained F=0.212 was less than the tabulated F=3.07 with 2, 117 degree of freedom at 0.05 level of significance

**Table-2**

**Analysis of Variance of resting heart rate among Sprinters, Middledistance and Long distance runners**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	61.55	2	30.775	1.897	0.155
Within Groups	1897.75	117	16.22		
<b>Total</b>	<b>1959.3</b>	<b>119</b>			

Tabulated 'F'= 3.07 (2,117) at 0.05 level of significance

The above table reveals that no significant difference was found in case resting heart rate among **Sprinters, Middle distance and Long distance runners** as the obtained F=1.897 was less than the tabulated F=3.07 with 2, 117 degree of freedom at 0.05 level of significance.

Table-3

**Analysis of Variance of resting respiratory rate among Sprinters, Middle distance and Long distance runners**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	205.717	2	102.858	22.363	0.00
Within Groups	538.15	117	4.6		
<b>Total</b>	<b>743.867</b>	<b>119</b>			

Tabulated 'F'= 3.07 (2,117) at 0.05 level of significance

The above table reveals that significant difference was found in case **resting respiratory rate** among **Sprinters, Middle distance and Long distance runners** as the obtained  $F=22.363$  was greater than the tabulated  $F=3.07$  with 2, 117 degree of freedom at 0.05 level of significance.

Table 4

**Mean Comparison among Sprinter, Middle Distance and Long Distance Runner in resting respiratory rate**

Sprinter	Middle Distance	Long Distance	Mean Diff	Critical Difference
17.775	17.325		0.45	
17.775		14.8	2.975	0.949575
	17.325	14.8	2.525	

\*Significant at 0.05 level of significance.

The above table reveals that no significant difference was found in case of sprinter and middle distance runner as the mean difference was less than the critical difference. Whereas significant difference was found in case of (sprinter and long distance runner) & (middle distance runner and long distance runner) as the mean difference was greater than the critical difference at 0.05 level of significance.

Table-5

**Analysis of Variance of fat % among Sprinters, Middle distance and Long distance runners**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.302	2	0.151	0.59	0.556
Within Groups	29.906	117	0.256		
<b>Total</b>	<b>30.208</b>	<b>119</b>			

Tabulated 'F'= 3.07 (2,117) at 0.05 level of significance

The above table reveals that no significant difference was found in case fat percentage among **Sprinters, Middle distance and Long distance runners** as the obtained  $F=0.59$  was less than the tabulated  $F=3.07$  with 2, 117 degree of freedom at 0.05 level of significance.

**Table-6**

**Analysis of Variance of Lean body weight among Sprinters, Middledistance and Long distance runners**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.252	2	3.126	0.847	0.431
Within Groups	431.677	117	3.69		
<b>Total</b>	<b>437.929</b>	<b>119</b>			

Tabulated 'F' = 3.07 (2,117) at 0.05 level of significance

The above table reveals that no significant difference was found in case Lean body weight among **Sprinters, Middle distance and Long distance runners** as the obtained  $F=0.847$  was less than the tabulated  $F=3.07$  with 2, 117 degree of freedom at 0.05 level of significance.

**Table-7**

**Analysis of Variance of negative breath holding among Sprinters, Middledistance and Long distance runners**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.317	2	0.658	0.109	0.897
Within Groups	708.15	117	6.053		
<b>Total</b>	<b>709.467</b>	<b>119</b>			

Tabulated 'F' = 3.07 (2,117) at 0.05 level of significance

The above table reveals that no significant difference was found in case negative breath holding among **Sprinters, Middle distance and Long distance runners** as the obtained  $F=0.109$  was less than the tabulated  $F=3.07$  with 2, 117 degree of freedom at 0.05 level of significance.

Table - 8

**Analysis of Variance of positive rate holding among Sprinters, Middle distance and Long distance runners**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	103.517	2	51.758	0.329	0.72
Within Groups	18380.08	117	157.095		
<b>Total</b>	<b>18483.59</b>	<b>119</b>			

Tabulated 'F' = 3.07 (2,117) at 0.05 level of significance

The above table reveals that no significant difference was found in case positive breath holding among **Sprinters, Middle distance and Long distance runners** as the obtained  $F=0.329$  was less than the tabulated  $F=3.07$  with 2, 117 degree of freedom at 0.05 level of significance.

### **Discussion of Findings:**

- 1) It was found that no significant difference was found in anaerobic power among AND resting heart rate of short , middle and long distance athletes as calculated value of f was less than the table value of f at 0.05 level of significance.
- 2) It was found that athletes belong to different running events differ significantly in resting respiratory rate among them. As further analysis shown that significant difference was found in short and long distance runner and middle and long distance runner as calculated mean difference was greater than the critical difference at 0.05 level of significance.
- 3) It was also found that no significant difference was found in fat percentage, lean body mass, breath hold capacity among different athlete.

### **Conclusion**

Within the limitations of the present study, the following conclusions may be drawn.

1. No significant difference was found in case of Anaerobic Power/Capacity, Resting heart rate, Resting respiratory rate, Body composition and Breath Holding Capacity among of sprinter, middle distance and long distance runner.
2. Significant difference was found in case of speed among sprinter, middle distance and long distance runner

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