

Comparison of the Selected Physiological Variables among the Students of the Indo- Gangetic Plain, Coastal and the Himalayan Regions

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Abstract

The purpose of the study was to compare the selected physiological variables among the students of the Indo- Gangetic plain, coastal and the Himalayan regions. The study was delimited to 1500 male school students, aged between 14 to 15 years. 500 each were selected from Indo –Gangetic plain, coastal and the Himalayan regions. Confirmation of their health was made prior to testing, whether they were fit for the testing program. The selected physiological variables were respiratory rate and blood pressure. The respiratory rate was measured through stop watch in numbers; blood pressure was measured through Sphygmomanometer in millimeters Hg. The analysis of variance technique was employed, to compare the means of the obtained data of Indo-Gangetic plains, Coastal and the Himalayan regions on the selected physiological variables. Further Scheffe's post –hoc test was used to determine the cell mean differences. There was significant difference among the means of Indo-Gangetic plain, Himalayan and Coastal regions on respiratory rate and blood pressure.

Keywords: Physiological Variables, Indo- Gangetic Plain, Coastal & Himalayan Region.

INTRODUCTION

Technology covers every aspects of life and sports are no exception to it. Sports science has enabled modern youth to develop physical capacities beyond our imagination. Sports have become highly competitive and records are being broken rapidly.

Sports persons have prominent place in the society in modern life. Millions of people participating in sports activities watch and read about them and spend hundreds of millions of rupees annually on sports related activities and equipment's. This has lead to a tremendous competitive elements in sports, as now sportsmen participate to win and achieve laurels for their country, contrary to earlier philosophy of the important thing is not winning but taking part.

According to Clarke (1975) man in action exposed to environment condition that might be classified as a typical, if not abnormal. The physiological concepts discussed until now have dealt with the body's response to normal exercise and training. But optimal condition do not always prevail the day may be excessively hot and humid and cold, the clothing or uniform may be inadequate or the individual may journey into unusual environment circumstances such as high altitude or under water.

In all such situation the organism must adjust to self-condition that tends to alter normal physiology in significant ways. The performer finds without acclimatization a period of adjustment to the rigors of the environment-his performance may be impaired. The body has a remarkable ability to compensate either wholly or partially environmental condition if given the opportunity. This does not mean that complete success will always be experienced. While it might be argued scientifically that slight impairment may not be particularly significant , to the athlete in competition it might well be the difference between winning and losing a contest .Moreover there may be an addictive effect when the performer competes in extend running , swimming , cycling or the like a compared with important with shorter events. The potential

length of the exposure is an important factor when considering the effect of adverse environment conditions.

Purpose of the study

The purpose of the study was to compare the selected physiological variables among the students of the Indo- Gangetic plain, coastal and the Himalayan regions.

Significance of the study

The study may contribute towards promotion of athletic performance in following ways:-

1. The findings of the study may provide criteria for selecting potential beginners in athletics according to their physiological limits in order to achieve competitive success.
2. It is likely that the result of the study may be used as a screening tool in success and classifying athletes especially a vast country like India.
3. It may help physical education teachers and coaches to develop sound training program besides devising remedial training programme.
4. The study may help physical education teachers and coaches by way of informing them about the physiological variables which the athlete requires especially in high altitude, moderate and sea level areas.
5. The study may motivate other athletic lovers and scholars to take-up similar studies so that this sport may become more scientific in India too.

METHOD

Selection of Subjects

1500 male students aged between 14-15 years were selected for the purpose of this study. Out of these 1500 subjects, 500 each were selected from Indo –Gangetic plain, coastal and the Himalayan regions. Confirmation of their health was made prior to testing, whether they were fit for the testing program. All subjects voluntarily agreed to extend full cooperation and the physical education teachers ensured that the subjects would make available for the collection of data as and when required.

Selection of Variables

A feasibility analysis as to which of the variables could be taken up for the investigation, keeping in view the availability of equipment, acceptability to the subjects and the legitimate time that could be devoted for tests and to keep the entire study unitary and integrated was made in consultation with experts. With the above criteria's in mind, the following physiological variables were selected since they directly related to the performance of an individual.

Physiological Variables (Measurements)

1. Respiratory rate
2. Blood pressure (Systolic pressure)

The following standardized tests were used to collect the relevant data on the selected variables and given in table-1.

Table-1: Test selection

Variables	Test Items	Unit of Measurement
Respiratory rate	Stop watch	Seconds
Blood pressure	Sphygmomanometer	Hg mm

Orientation to the subjects

Before the collection of the data, through administering the tests the subjects were given orientation about the purpose of the study. The investigator had explained about the test

procedures to be adopted by them for measuring the selected variables such as Respiratory rate and blood pressure.

Tester competency

Reliability of the investigator measuring anthropometrical measurements variables was established by test-retest method by computing coefficient of correlation between the scores obtained twice on ten subjects. The coefficients of correlation obtained were given in table: II

Table –II: Reliability coefficient of test –retest scores

Tests	Coefficient of Correlation
Respiratory rate	0.94
Blood pressure	0.93

Administration of the tests

Respiratory rate: -

Equipment: Stop watch

Method:- Subjects were asked to sit on the easy chair comfortably. The stopwatch was started coinciding with testers observation. Then the upward and downward movements of abdominal region were recorded for the duration of one minute and two multiply the total counts, which denoted the respiratory rate. The respiratory rate was taken immediately after exercise for a period of one minute and the two multiply the total counts.

Systolic blood pressure

Equipment's:- Sphygmomanometer, Stethoscope, stopwatch.

Method: - A dial type of Sphygmomanometer made in Japan and a Stethoscope supplied by biological concern, Calcutta, was used for measuring the systolic and diastolic pressure. While taking blood pressure the subject's left arm was completely bared to make sure that the clothing did not constrict the blood vessels. The blood pressure measurement was taken with subject in a sitting position; his forearm was supported on the handle of the chair. The cuff was wrapped around the arm, evenly with the lower edge approximately one inch above the anticubital space. The Stethoscope receiver was placed gently over the artery in anticubital space.

It was made sure that the stethoscope was free from contact with the cuff. The cuff was inflated until the artery was fully pressed to the extent that no pulse beat could be heard; pressure was then released as the investigator watched the dial. When the first sound of the pulse became audible the reading in millimeters of mercury (Hg mm.) instantly was recorded as the systolic blood pressure. The measurements were repeated twice for each subject and the better was recorded as his scores in this variables.

Statistical procedure

The analysis of variance technique was employed, to compare the means of the obtained data of Indo-Gangetic plains, Coastal and the Himalayan regions on the selected physiological variables. Further Scheffe's post-hoc test was used to determine the cell mean differences.

ANALYSIS OF DATA

Respiratory Rate

The analysis of variance on the data obtained on respiratory rate of Indo-Gangetic plain, Himalayan regions and Coastal regions have been analysed and presented in Table –III.

Table III: Analysis of Variance on Respiratory Rate of Indo-Gangetic Plain, Himalayan and Coastal Regions

Mean \pm Standard Deviation			Sources of Variance	Sum of Square	df	Mean Squares	F-ratio
Indo-Gangetic plain	Himalayan regions	Coastal regions					
19.98	24.77	20.29	Between	7188.50	2	3594.2	322.64*
± 1.97	± 4.78	± 2.58	Within	16681.18	1497	11.14	

* Significant at .05 level of confidence

The obtained F-ratio value is 322.64, which is higher than the table value 2.99 with df 2 and 1497 required for significance at .05 level. Since the value of F-ratio is higher than the table value, it indicates that there was significant difference among the means of Indo-gangetic plain, Himalayan and Coastal regions on respiratory rate. To find out which of the three paired means had a significant difference, the Scheffe's post-hoc test was applied and the results are presented in table Table-IV

TABLE-IV: Scheffe's Test for the Differences between the Paired Means of Respiratory Rate among Indo-Gangetic Plain, Himalayan and Coastal Regions

Mean values			Mean Differences	Confidence Interval Value
Indo-Gangetic plain	Himalayan regions	Coastal regions		
19.98	24.77		4.79*	0.52
19.98		20.29	0.31	0.52
	24.77	20.29	4.48*	0.52

* Significant at .05 level of confidence.

The table- IV shows that the mean difference in respiratory rate between Indo-Gangetic plain and Himalayan regions and Himalayan regions and coastal regions are 4.79 and 4.48 respectively which are higher than the confidence interval value of 0.52 at .05 level of confidence. The mean difference between Indo-Gangetic plain and coastal regions is 0.31, which is less than the confidence interval value of 0.52 at .05 level of confidence.

The result of the study indicates that there was significant difference between Indo-Gangetic plain & Himalayan regions and Himalayan regions & coastal regions, and there was no significant difference between Indo-Gangetic plain and coastal regions on respiratory rate.

Systolic blood pressure

The analysis of variance on the data obtained on Systolic blood pressure of Indo-Gangetic plain, Himalayan and Coastal regions have been analysed and presented in Table V.

TABLE-V: Analysis of Variance on Systolic Blood Pressure of Indo-Gangetic Plain, Himalayan and Coastal Regions

Mean \pm Standard Deviation			Sources of Variance	Sum of Square	df	Mean Squares	F-ratio
Indo-Gangetic plain	Himalayan regions	Coastal regions					
120.22	114.70	118.18	Between	7791.36	2	3895.68	102.92*
± 6.06	± 6.12	± 6.27	Within	56667.24	1497	37.85	

* Significant at .05 level of confidence

The obtained F-ratio value is 102.92, which is higher than the table value 2.99 with df 2 and 1497 required for significance at .05 level. Since the value of F-ratio is higher than the table value, it indicates that there was significant difference among the means of Indo-gangetic plain, Himalayan and Coastal regions on systolic blood pressure. To find out which of the three paired means had a significant difference, the Scheffe's post-hoc test was applied and the results are presented in table-VI.

TABLE-VI: Scheffe's Test for the Differences between the Paired Means of Systolic Blood Pressure among Indo-Gangetic Plain, Himalayan and Coastal Regions

Mean values			Mean Differences	Confidence Interval Value
Indo-Gangetic plain	Himalayan regions	Coastal regions		
120.22	114.70		5.52*	0.95
120.22		118.18	2.04*	0.95
	114.70	118.18	3.48*	0.95

* Significant at .05 level

The table-VI shows that the mean difference in systolic blood pressure between Indo Gangetic plain and Himalayan regions, Indo Gangetic plain and coastal regions and Himalayan regions and coastal regions are 5.52, 2.04 and 3.48 respectively which are higher than the confidence interval value of 1.46 at .05 level of confidence.

The result of the study indicates that there was significant difference between Indo-Gangetic plain and Himalayan regions, Indo-Gangetic plain and coastal regions and Himalayan regions and coastal regions on systolic blood pressure.

Conclusions

The result of the study reveals that a significant difference exists in selected physiological variables such as respiratory rate and systolic blood pressure among the students of Indo Gangetic plain, the Himalayan and the Coastal regions.

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