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Analysis of physiological parameter among low and moderate altitude school children

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Abstract
Study was conducted on the physiological parameter of school children of two altitude levels from Jammu And Kashmir State. Total numbers of subjects selected for the study were two hundred and fifty two (252). The subjects were taken from the class 8th and 9th between the age group of 10 to 13 years. The selected subjects for the study were male school children from different high schools. All the related information regarding the tests and collection of data was discussed with the subjects, so that they will cooperate and give good results for the study. The selected variable for the study was body mass index (BMI), for which subject's weight and stature was measured. At the result of the test the researcher did not find any significant difference between the three sources (altitude, district and age). The data was collected and analyzed by using Statistical Package for Social Sciences (SPSS) version 21.0 by applying 2 x 3 x 3 factorial ANOVA. The level of significance was fixed at 0.05.

Keywords: Physiological parameter, BMI, school children, SPSS, ANOVA

Introduction
Physical fitness can be defined as "a set of attributes that community have or achieve that relates to the ability to perform physical activity" or exercise training (Blair, 1992) [1]. In the field of public health, the most frequently cited components of physical fitness fall into two groups: one related to health and the other related to motor skills (Pate, 1983) [6].
In the definition of (Caspersen, 1985) [3] that was later used by other authors (Bouchard, 1994) [2] body composition (sometimes also called morphological fitness) is a component of physical fitness. However, in the current research it is often necessary to make a difference between the morphological component and the cardio-respiratory and motor components, as these concepts are analyzed in detail. In the present work the researcher therefore use the terms physical fitness (aerobic fitness, agility, balance) and body composition (BMI) separately, as has been done in other studies. (Macera, 1989) [5] In response to our publications, some reviewers stated that the term "physical fitness" should be defined in terms of four components: aerobic fitness, muscular strength, muscular endurance and flexibility and that agility and balance were not part of physical fitness. As we did not find any references to back up this position, we based our methodology on the above mentioned definition of (Pate) in our opinion the most appropriate concept in our scientific field.

Methods
Subjects
For the purpose of the study two hundred and fifty two (252) subjects were selected for the study. The subjects were selected from different high school of Jammu and Kashmir state. From there six districts were selected and from each district three schools were selected for the accomplishment of the data collection. The data was collected in a proper way for that the researcher received proper consent from the higher authorities especially from Zonal education officer and head of the institutions after that further process was done. The importance of the study was discussed with the subjects and with the head of the institutions, in the presence of physical education teacher. The subjects were selected on by using the stratified sampling technique. The cooperation of the subjects was very good while taking the tests.

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Variables and tests

For the accomplishment of the study body mass index was measured of the pre-adolescent school children. The test for the study was done to measure the weight and statue of the subjects. The study provide us information about the physiological fitness of the school children.

Statistically Technique

The present investigation was statistically analyzed by using the 2 x 3 x 3 factorial ANOVA. By applying these tests the researcher would found significant difference on physiological parameters between the low and moderate altitude of school children.

Results

The mean and standard deviation in body mass index between low and Moderate altitude regions male students (Table -1).

Table 1: Mean and Standard Deviation on Body Mass Index

Classification on Age	Low Altitude regions			Moderate Altitude regions		
	Jammu	Udhumpur	Ramban	Anantnag	Kulgam	Budgam
10 to 11 year	17.46 ± 1.79	16.46±2.39	17.20± 1.48	17.94± 1.64	18.51±1.83	19.36± 1.76
11 to 12 year	18.27 ± 2.90	19.33± 1.77	17.83± 2.75	17.52± 2.96	17.63 ±2.52	16.51± 4.77
12 to 13 year	16.06 ± 2.27	15.15± 2.74	17.19± 2.38	18.01± 1.95	17.92±2.28	18.63± 1.04

Body mass index measured between low and moderate altitude region reveals significant difference, irrespective of districts and age as the obtained F ratio of 6.634 which is greater than the required table value of 3.882 at α = 0.05 for the df of 1 and 234. However, the findings also disclose there is no significant difference on body mass index between districts irrespective of altitude and age, since the obtained F ratio of 0.338 is less than the required table value of 3.882 at α = 0.05 for the df of 1 and 234. Further, the findings disclose that there is no significant difference on body mass index among different age group irrespective of altitude and districts as the obtained F ratio of 2.174 is less than the required table value of 3.882 at α = 0.05 for the df of 1 and 234.
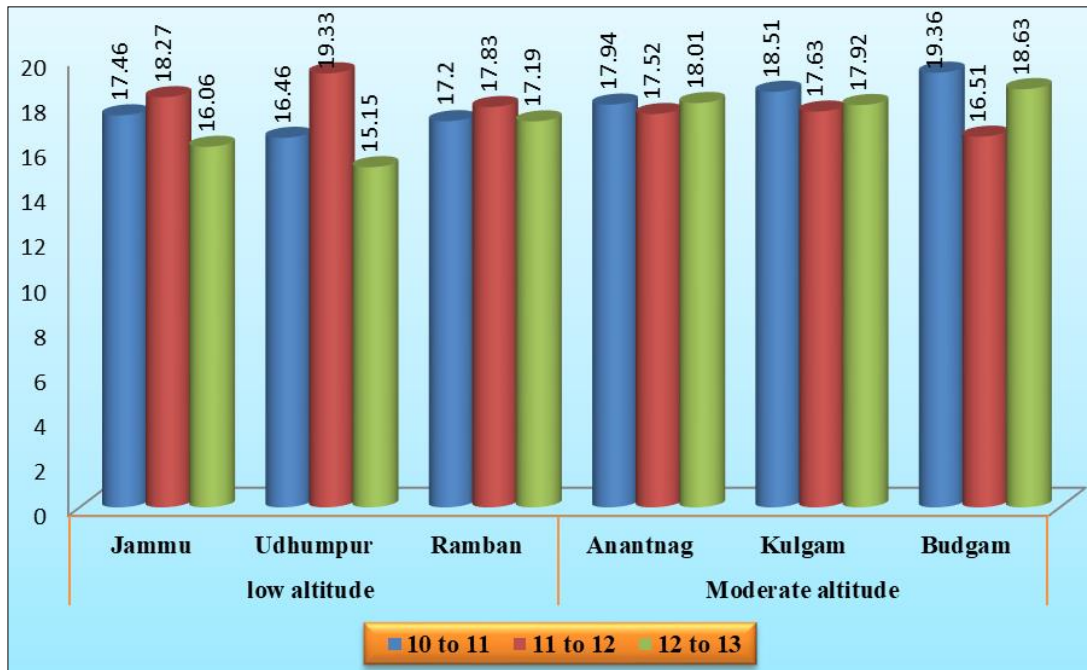

Fig 1: Mean values of Body Mass Index are graphically represented of Low and Moderate altitudes

Table 2: Summary of ANOVA for $2 \times 3 \times 3$ factorial experiments on Body Mass Index

Source of Variation	SS	Df	MS	F	Sig
Between Ss					
A (Altitude: Low and Moderate)	39.060	1	39.060	6.638	0.011
B (Districts)	3.975	2	1.988	0.338	0.714
C (Age: 10 to 11; 11 to 12 & 12 to 13)	25.582	2	12.791	2.174	0.116
AB	2.467	2	1.234	0.210	0.811
AC	134.37	2	67.189	11.419	0.000
BC	56.784	4	14.196	2.413	0.050
ABC	19.575	4	4.894	0.832	0.506
Error	1376.87	234	5.884		

The study also reveals that there is no significant difference exists on body mass index among the interaction of altitude and district, irrespective of age as the obtained F ratio of 0.210 is less than the required table value of 3.034 at α = 0.05 for the df of 2 and 234. Moreover, the interaction of altitude and age, significant difference was found irrespective of district as the obtained F ratio of 11.419 which is greater than the required table value of 3.034 at α = 0.05 for the df of 1 and 234. Further, the findings disclose that there is no significant difference on body mass index among the interaction of district and age, irrespective of altitude since the obtained F ratio of 2.413 is less than the required table value of 3.034 at α = 0.05 for the df of 1 and 234. Similarly, the findings disclose that there is no significant difference on body mass index among the interaction of altitude, District and age as the obtained F ratio of 0.832 is less than the required table value of 3.034 at α = 0.05 for the df of 1 and 234.

Discussion

In our study it was reported that among the three sources (altitude, district and age) shows no significant difference on body mass index among the interaction of Altitude, District and Age as the 'F' ratio of 0.832 is less than the required table value of 3.034 at level of 0.05 significance. As studied by (Ramash, 2011) [7] found that there was no significant reduction in the performance of selected Body mass index (BMI). The number of circulating progenitor cells can be increased, and there positive trend in body mass index, also it was declared that no significant difference was found for body mass index (Walther, 2009) [8]. Similar, study was done by the (Lewis, 2005) [4], stated that there was no significant difference on body mass index after the 30 to 60 minutes of moderate and high intensity exercises.

Conclusion

It was concluded that the physiological parameter body mass index of pre-adolescent school children might be appropriate to generalize the fitness and development of the school children. On the basis of practical world school children should be given such an important way of physiological fitness techniques for the development of physical well being of our coming generation.

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