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## Body mass index and physical performance of Jammu and Kashmir State school boys. A cross sectional study

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### Abstract

The purpose of current study was to ascertain variations of BMI (Body Mass Index) and physical fitness parameters between urban and rural school going students. Total 300 boys' students (n=300) had been selected for current study from different urban and rural government schools of Jammu district, their age ranged between 12-15yrs. All the subjects were intimated about the procedure and methodology of the study and they were agreed to participate in this study. The subjects were gone through different physical fitness test. The subjects were assessed on speed by 50yd dash, muscular endurance of upper extremities by pushups, muscular endurance of abdomen muscles by sit ups, shoulder strength by medicine ball throw, explosive strength by standing broad jump and cardiovascular endurance by six minute run and walk T-test was used to find the difference between both groups. To test the hypothesis, the level of significance was set at 0.05. The results of the study revealed that the rural school going students found better than urban students in the component of Muscular endurance of Upper Extremities, explosive strength and Cardiovascular Endurance. Whereas, urban schools students found better than rural students in BMI.

**Keywords:** Body mass physical performance ascertain variations of BMI

### Introduction

Human performance depends on physical wellness which is a positive and dynamic quality on a continuum from inexhaustible life to death. It is identified with the ability to fulfil the requirements of the nature, clearly to groups the differences for an healthy life. Physical wellness is negligible in the truly sick and is higher in the exceptionally moulded people. While energy demanded for every day work fluctuates in people. Some population between these minimal and maximal poles is satisfactory for many peoples. Since individuals from the populations, not divisible into discrete parts, physical fitness effects all phases of human life. It is imperative for entire individual to keep up neuromuscular, cardiovascular and other natural systems by enhancement of physical wellness through exercise. Activities with moderate in amount and intensity, which are performed ideally thrice in seven days for around 30 minutes on most, if not all days of the week, carry minimal health risk. These exercises incorporate the traditional physical activities which are an important part of numerous societies, similar to dances and traditional games. Engaging in adequately managed relevant physical activities of longer duration or of more vigorous intensity may also provide added health gain. Physical teachers are tested to team up with general wellbeing, experts in creating and assessing school physical training programs that would enhance the strength of the country's youth. (Sallis and Mckenzie 1991) <sup>[1]</sup>. Very much planned physical training programs have delivered criticalmedical advantages (Dwyer *et al.* 1983) <sup>[2]</sup>. Durant *et al.* (1994) <sup>[3]</sup> found a relationship between television watching, physical activity and body composition. Children who watched more television and were less likely to participate in vigorous activity tended to have lower BMIs. Serl (1963) <sup>[4]</sup> concluded that the group (experimental group) who gone through physical fitness programme perform better in physical fitness test that controlled group students. Drowatzky & Madary (1966) <sup>[5]</sup> found that the boys who were involved in additional physical activity outside the routine physical education classes were more fit than the boys and the girls who were exempted from physical education programs. Dahl (1971) <sup>[6]</sup> conducted an investigation to assess physical fitness differences between black and white boys.

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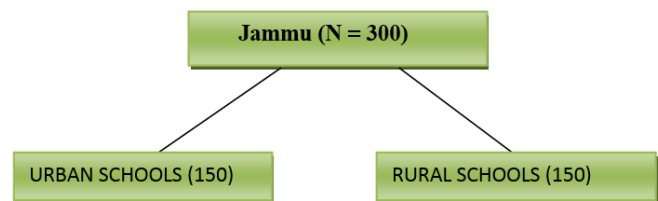
200 school boys were chosen for the study as subjects. Physical wellness of the subjects was surveyed with standing broad jump, sit-ups, and softball throw tests. The outcomes of the survey showed that the physical wellness of black boys were significantly better than the white boys. Andrews (1976) [7] analyzed the physical wellness of South African and Canadian young men. AAHPER's physical fitness test comprised of standing broad jump, flexed arm hang, one-minute sit-ups, shuttle run, 20meter dash and 600 yards run/walk test were utilized to gauge the physical wellness of the subjects. It was clear from the outcomes that physical wellness of the South African young men was altogether superior the Canadian young men. Maity (1983) [8] conducted a study on "Comparison of Physiological and Physical Fitness Variables between Tribal and Non-tribal High School Students of Murekatha Nehru Bidya Bhawan in Midnapur District of West Bengal". Age of subjects was ranged between 14-17 years. It was seen that the peak respiratory flow rate, and speed endurance and anaerobic capacity of tribal students were significantly higher as compared to non-tribal students. There is paucity of studies which show the difference in physical fitness between urban and rural school going students as there is difference in the social economic and other differences in the uplifting of students in both groups. The present study was design to find out the differences between urban and rural school boys in body mass index and selected physical parameters.

### Methods

The subjects were assessed on the body mass index (BMI) and Physical fitness components. 300 male students, aged 12 to 15 yrs (mean 13±2 yrs) were recruited randomized from of urban (10) & rural (10) High Schools of Jammu district of

Jammu and Kashmir. 15 boys were selected randomly from each school.

### Flow Chart of Sampling



### Selection of Variables

The following variables were selected for this study:-

#### Body Mass Index

Body Mass Index of the subjects was determined by using the following formula:

#### Weight (Kg)

**BMI =**

**Height (meter) 2**

The standard instruments were used for collection of data namely vertical scale for height and Miller's weighing machine for body weight.

#### Physical Performance

International Physical Performance Test (ICSSPE, 1985) consisting the following six items was used to measure the physical performance of the subjects:

S. No.	Component	Test	Procedure
1.	Speed	Twenty Meters Dash	On the signal "Take your marks", the subjects were asked to stand with his front foot behind the starting line. When ready, the starting signal was given and the subjects sprinted as fast as possible to across the finish line and the stopwatches were stopped as and when the concerned subject covered the distance. The test was performed twice. The best time was recorded as a score. In the event of a false start, the race was re-run.
2.	Muscular Endurance of Upper Extremities	Push Ups	The subject was instructed to lies down on the floor with the body straight, arms bent and hands flat on the floor beneath the shoulders, uses the toes as the pivot point and pushes upward to a straight-arm position, lowers the body until the chest touches the floor and repeated exercise as many times as possible, without rest. The body must be stayed rigid throughout the test. A sponge that is 2 inches high was placed on the floor for the performer to touch with the chest. The score was the number of correct push-ups completed in 30 seconds.
3.	Muscular Endurance of Abdomen Muscles	Sit Ups	The subject was instructed to perform as many sit ups as possible over 30 seconds period. The subject was asked to lie on a flat surface holding a basketball behind his neck, keeping legs flexed at 90 degree with the help of a partner holding legs at ankle joint. At the signal, "Ready-go", the subject started pulling himself up so that both elbows make contact with the arms of the partner. The subject had to move back until the ball touched the ground again. This procedure was repeated continuously as many times as possible until the 30 seconds period elapsed. The score was the number of times the elbows touch the arms over 30 seconds for those sit ups which was correctly performed. The test was performed once.
4.	Shoulder Strength	Medicine Ball Throw	The subject was advised to perform an overhead throw as far as possible using a 2-kg medicine ball with both hands from standing position. The subject was asked to stand at the base line (in a step position) with the forward leg bearing the main weight of the body. While throwing the medicine ball, subject was not permitted to move beyond the base line. By going back with the trunk, the subject could obtain the energy necessary for throwing the medicine ball with both hands. The score was the distance of the throw in meters and decimeters. The test was performed twice and the best throw recorded was as a score.
5.	Explosive Strength	Standing Broad Jump	The subject was required to jump as long as possible from the take offline. The subject was asked to stand at the take offline with feet comfortably apart. Then, by bending his knees and taking his arms backward he jumps by extending his knees and swinging his arms forward. No restriction was placed on his arm or leg movements. The score was the distance of the jump in centimeters from the takeoff line to the back of the heel nearest the line at impact. The test was performed twice, and the best jump was recorded.
6.	Cardiovascular Endurance	Six minute Run and Walk	The subjects were instructed to run as far as possible in 6 minutes. The 6 minute run was performed in groups of ten subjects. The starting line was set at the marked field. The running direction was counterclockwise. The subjects started running on the signal "Ready-go". Walking was permitted, but it was made clear that the objective of the test is to cover as much distance as possible by running/walking. The laps for each subject were counted on a record sheet. The minutes remaining were announced, and the final ten seconds was counted aloud. After 6 minutes, a whistle was blown and the subjects had to stop immediately on the running track/ field. The score was the distance in meters covered in 6 minutes. The distance was calculated by: "Total laps completed x distance of one lap + The distance of the covered in last lap".

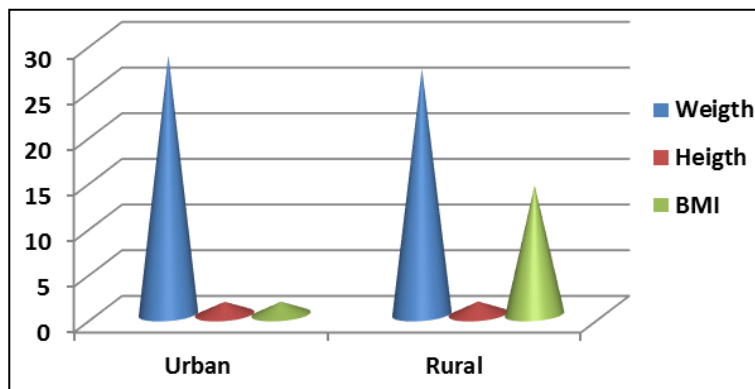
The standardized instruments such as measuring tape, medicine balls, cones and stopwatches were used for collecting the data.

**Results**

**Table 1:** Significance of difference of means of weight, height and body mass index of sixth class urban and rural school boys of Jammu and Kashmir

Variable	Urban (250)		Rural (250)		‘T’ value	Sig.
	Mean	SD	Mean	SD		
Weight (KG)	28.35	5.01	26.92	5.36	6.15	.000
Height (CM)	1.37	.09	1.40	0.08	8.14	.000
Body Mass Index (Kg/m <sup>2</sup> )	15.37	3.35	14.12	2.48	11.90	.000

\*Significant at 0.05 level.



**Graph-1**

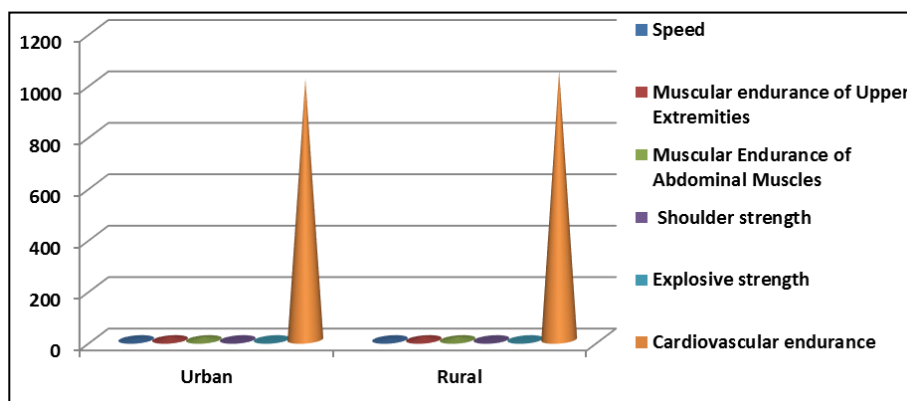
Table-1 show the descriptive statistics and t- value of weight, height and BMI of urban and rural school boys. The mean of the weight of urban and rural school going boys are 28.35 and 26.92 respectively. The ‘t’ value revealed that urban boys were significantly heavier ( $t=6.15, p<.000$ ) than the rural school boys. The mean of the height of urban and rural school going boys are 1.37 and 1.40 respectively. The value of ‘t’ height

( $t=8.14, p<.000$ ) revealed that rural boys were significantly differ than the urban school boys in height. The mean of the BMI of urban and rural school going boys are 15.49 and 14.12 respectively. The BMI ( $t= 11.90, p<.000$ ) of urban school were also significantly higher than their rural counterparts.

**Table 2:** Significance of difference of means of physical performance and its components of sixth class between urban and rural school boys of punjab

Variable	Urban (250)		Rural (250)		T value	Sig.
	Mean	SD	Mean	SD		
Speed (sec.)	4.98	.58	4.95	.52	.76	.468
Muscular endurance of Upper Extremities (in numbers)	13.26	3.71	13.92	3.81	3.78	.000
Muscular Endurance of Abdominal Muscles (in numbers)	11.62	3.19	11.52	.89	.98	.352
Shoulder strength (meters)	2.45	.64	2.49	.66	1.18	.230
Explosive strength (meters)	1.40	.16	1.46	.16	3.80	.000
Cardiovascular endurance (in meters)	1015.04	180.34	1046.01	176.32	3.78	.000

\*Significant at 0.05 level.



**Graph-2**

Table-2 indicates the descriptive statistics and ‘t’-value of physical fitness components of the urban and rural school boys. The mean of the speed of urban and rural school going boys are 4.98 and 4.95 respectively. The value of ‘t’ ( $t=.76, p>.000$ ) revealed that urban and rural school boys did not

significantly different. The mean of the muscular endurance of Upper Extremities of urban and rural school going boys are 13.26 and 13.92 respectively. The ‘t’ value shows that rural school boys were significantly better than urban boys in muscular strength of upper extremities ( $t=3.78, p<.05$ ). The

average value of muscular endurance of are abdominal muscles of urban and rural school going boys are 11.62 and 11.52 and 't' value ( $t=3.52$ ,  $P>.000$ ) show that no significant difference found between urban and rural school going students in muscular endurance of are abdominal muscles. The mean value of explosive strength of urban and rural boys are 2.45 and 2.49 respectively and 't' value ( $t=3.66$ ,  $p<.000$ ) show that rural school going students were better than urban students in explosive strength. The sixth class rural boys were also better than the urban boys in cardiovascular endurance ( $t=3.62$ ,  $p<.000$ ). Whereas, the average value of cardiovascular endurance are 1015.04 and 1046.01 respectively. The 't' value ( $t=3.78$ ,  $p<.000$ ) revealed that rural school going students were better than urban student in cardiovascular endurance.

### Discussion

The investigator analyzed the collected data as per the aim of study. The statistical analysis of data. The results of the study revealed that the rural school going students found better than urban students in the component of Muscular endurance of Upper Extremities, explosive strength and Cardiovascular Endurance. Whereas, urban schools students found better than rural students in BMI. These differences may be due to better facilities of transportation in urban area and the students of rural area used to walk to reach the schools.

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