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Children's Body Mass Index: A Comparative Study of Out-city and Inner-city Youngsters in Khyber Pakhtunkhwa, Pakistan, at the Elementary Educational Institution Level

* Abdur Rashid, Deputy Director Sports

** Bahar Hussain, Lecturer

*** Dr. Farooq Hussain, Assistant Professor (Corresponding Author)

Abstract

This investigational work aims to analyze the body mass index (BMI) of elementary educational institution youngsters aged 7-12 years and to assess inner-city and pastoral youngsters in Khyber Pakhtunkhwa (Pakistan). The target population was elementary educational institution youngsters, of whom 500 were sampled by simple random sampling from educational institutions in both out-city and inner-city locations. Data were collected by height and weight measurements and analyzed with SPSS version 20. Quantitative analysis instruments were employed. A comparative evaluation of the data reflected that the body mass index of inner-city youngsters was substantially better than that of their pastoral counterparts.

Keywords: BMI, Inner-City Elementary Educational Institution Youngsters, Out-City Elementary Educational Institution Youngsters

Introduction

Corpulence and flabbiness among youngsters worldwide have improved note worthily in current times; the World Health Organization (WHO) has recognized that obesity is a "global epidemic disease" (WHO, 2016) and addresses all countries (Chen et al., 2018).

Body mass index (BMI) can be used to differentiate the categories of underweight, normal body weight, corpulent, and obesity. Moreover, obese and overweight youth grow faster in lower-income and intermediate-income nations than in high-level-income nations (World Health Organization, 2016). Assessment of body composition and calm body mass index is obtained by comparing the amount of fatty acids to a thin dipped weight (light) that in turn consists of ligaments, muscles, bones, tendons, etc. consists of. (Meters) divided by weight (kg) is called body mass index. Therefore, based on this assessment, analysis of the flab and other ingredients/parts that make fit the frame of man strong.

The initial information on the aspects connected to health is essential so that one can evaluate the corporeal grass and assess it with the lean corporeal weight (Tomiyama, Hunger, Nguyen-Cuu and Wells, 2016). It is well known that young people with fat bodies and other obese people have reduced capacities and other functions. The IMC always prejudices the return. Romero-Corral et al. (2008) argue that the IMC is a medium of the comparative aptitude of the body of a child. An optimal IMC is very unavoidable because the IMC is as good as its risks. Becker and col. (2011) discover that the IMC serves as the principal disposition to stand for the normal exam of the body. de Barros, Fragoso, Oliveira, Cabral Filho y Castro (2003) examined the positive relationship between the year of creation and the levels of IMC. Hussain (2018) states that in combination with the social and ambient conditions, the socio-cultural elements are also interconnected, visualizing the relationship between the normative lifestyle and the non-normative lifestyle style with chronological factors. In his study of physical aptitude, Rosvold (2019) found that out-city youth have a better level of appetite than inner-city youngsters. In Pakistan, young people constitute the largest cohort of the population. The investigational work intends to assess the IMC of the youngsters of the primary educational institution

* Directorate of Higher Education, Khyber Pakhtunkhwa Email: abdurrasheed564@gmail.com
** Government Degree College, Shewa Swabi Email: baharscope@gmail.com
*** Department of Physical Education & Sports, Abdul Wali Khan University Mardan
Email: farooqhussain@awkum.edu.pk

in the province of Khyber Pakhtunkhwa, Pakistan, and explore the variations between inner city and out city residents.

Method

The measurement of the height and weight of educational institution-going youngsters is considered comparatively very economical and appears more suitable for educational institution youngsters. Height square in meters divided by weight in kilograms is a feasible and valid formula for measuring Body mass index (BMI) devised by (Bagherian & Sadeghi, 2013). Anthropometrical Considerations comprise stature, load, and Body mass index (BMI). The selection of the test has been made based on its reliability as well as applicability and amicable implementation by sports teachers and physical education instructors. Measuring the height and weight of youngsters attending educational institutions is considered relatively economical and seems more appropriate for educational institution youngsters. Height per square meter, divided into kilograms, is a feasible and valid formula for measuring body mass index (BMI) (Bagherian & Sadeghi, 2013). Anthropometrical strictures depend on elevation, heft, and body mass index. The test was selected based on reliability and the applicability and friendly implementation of sports teachers and physical education instructors.

Population

The population of this study was Khyber Pakhtunkhwa - Pakistan Province - elementary educational institution Participants. Participants in this specific study were youngsters aged 7-12 attending elementary educational institutions. 900 participants constituted the population.

Sampling Technique and Sample

Simple random techniques were employed for the selection of the youngsters from elementary educational institutions, having age 7-12, keeping both strata in mind. The researcher employed Krejcie and Morgan's (1970) standard sample size determination table for sample, and accordingly, five hundred youngsters from the preferred age group were chosen as samples. The sample was taken from ten government elementary educational institutions in the inner city and out city locations of Khyber Pakhtunkhwa, as defined by EMIS District Education Office. Five educational institutions from both strata were chosen to perform the General Motor Test (GMT). Fifty youngsters from each educational institution participated in the study: 10 from the specified age group, i.e., 7, 8, 9 and 12 years. These 500 youngsters were randomly chosen for the study from grades 3, 4, 5, and 6 from the educational institution attendance registers.

Data were analyzed using version 20 of the Social Sciences Statistical Package (SPSS), where both descriptive and inferential statistical methods were employed. An independent sample test was employed to assess the body mass index of out-city with inner-city youngsters.

Results

Height:

The table shows that the average height of elementary educational institution youngsters (7-12 years old) from both inner city and out city locations is 1.36 meters, and the STD is 0.11. There is a marginal variation in height between out-city (mean = 1.36 m and SD = 0.12) and inner-city (mean = 1.38 m and SD = 0.11) youngsters. Predictable variation -0.02 (SE = 0.01). Moreover, a 95% confidence level is found that the factual mean remains between -0.3623and 0.000439 (Table 1.2).

An independent sample test was done to assess the length of inner-city and out city youth from 7 to 12 years. The calculated p-value is displayed as 0.051 (Table 1.2) that is > 0.05. Therefore, the variations in the averages of the two groups were not analytically substantial at the 5% confidence level. The figure also assesses the averages in terms of the height of the subjects in the inner city and out city locations.

Based on the data provided, the normal stature of out-city youngsters is marginally better than the inner-city group average, but this variation is not analytically substantial. Besides, inner-city youngsters are relatively more consistent in terms of their height than out-city youngsters.

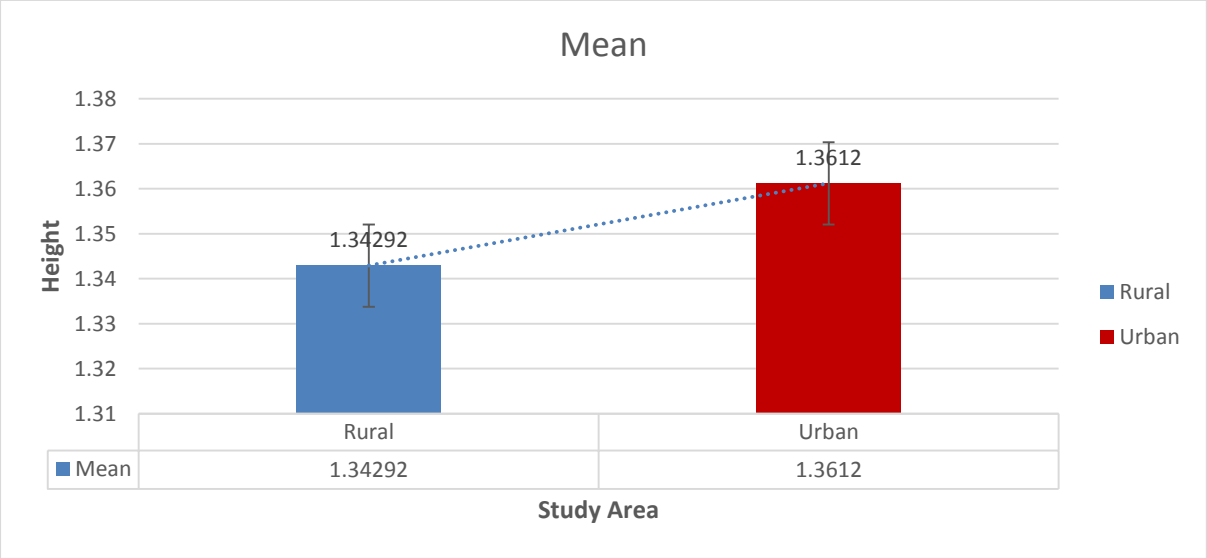
Table 1.1 Group Statistics by height

Total / Group	N	Mean	Std. Deviation	c.v
Height Total	500	1.3621	.10686	7.90%
Out-city	250	1.3629	.12096	8.26%
Inner-city	250	1.3812	.11199	7.49%

Table 1.2 statistical comparisons of means of inner-city and out city youngsters by height

T	df	Sig. (2-tailed)	Mean Variation	Std. Error Variation	95% Confidence Interval of the Variation	
					Lower	Upper
-1.918	498	.051	-.01828	.00953	-.03623	.000439

Graph 1.1: Graphic description of means between inner city and out-city youngsters by height



Weight:

The table shows that the average weight of all youngsters (7-12 years old) living in both inner city and out city locations is 31.93 kg, and the STD is 6.69. The normal body mass of out-city youngsters (mean = 30.83 kg and SD = 6.90) appears to be lower than that of inner-city youngsters (mean = 33.02 kg and SD = 8.33). Predictable variation -2.18 (SE = 0.68). Besides, we have 95% confidence that the factual mean remains between -3.5288 and -0.8392 (Table 1.4).

An independent sample test is performed to assess the weights of the inner city and out city youngsters. The p-value calculated was 0.002 (Table 1.4), which is <0.05. Therefore, the variation between the average weights of out-city and inner-city youngsters is analytically substantial at 5% confidence. The figure also highlights the variation in weight between out-city and inner-city individuals.

Based on the data provided, the average weight of inner-city youngsters is relatively better than the average weight of out-city youngsters. However, out-city youngsters are more severe compared to inner-city youngsters (Table 1.3).

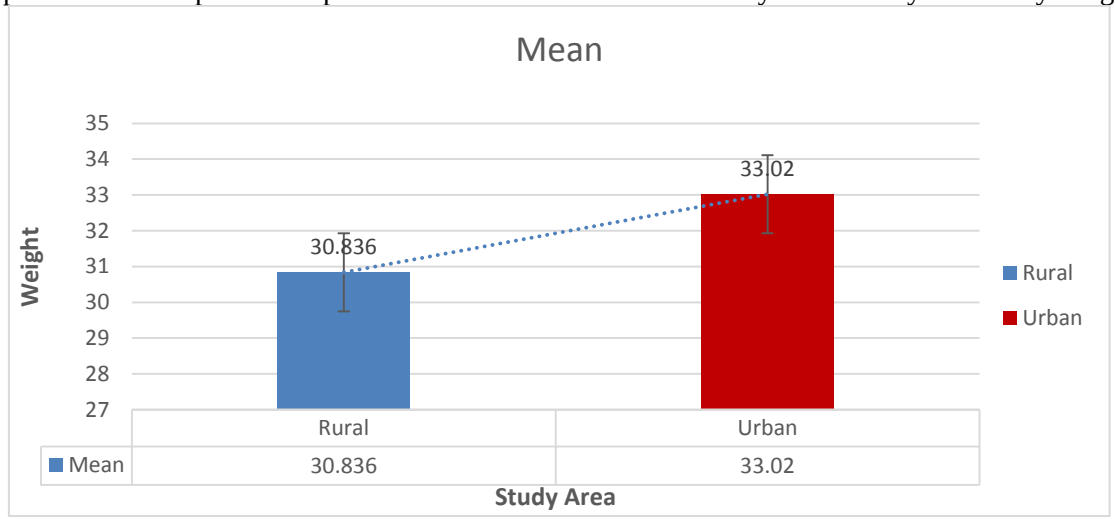
Table 1.3 Group Statistics by weight

Total / Group	N	Mean	Std. Deviation	c.v
Weight Total	500	31.928	6.692	24.19%
Out-city	250	30.836	6.9010	22.38%
Inner-city	250	33.020	8.3365	25.25%

Table 1.4 comparative variations between out-city and inner-city youngsters by weight

T	df	Sig. (2-tailed)	Mean Variation	Std. Error Variation	95% Confidence Interval of the Variation	
					Lower	Upper
-3.191	498	.002	-2.1840	.6845	-3.5288	-.8392

Graph 1.2: Graphic description of two means between inner city and out-city student by weight



Body mass index (BMI)

The analysis of the group statistics (Table 1.5) shows that the average BMI of elementary educational institution youngsters (7-12 years old) from the inner city and out city locations is 17.24 Kg / m2 and the STD is 2.10. In comparison, the body mass index of inner-city youngsters (mean = 17.57 Kg / m2 and SD = 2.32) appears to be better than the body mass index of out-city youngsters (mean = 16.89 Kg / m2 and SD = 1.79). Predictable variation -0.68 (SE = 0.19) (Table 1.6). Here again, we have 95% confidence that the true mean variation will remain between -1.04312 and -0.31336 (Table 1.6).

An independent sample test was performed to assess body mass index (body mass index) of inner-city and out city youngsters. The p-value calculated is 0.00 (Table 1.6), which is <0.05. Therefore, the variation between the mean body mass index values of both groups is analytically substantial. The figure shows the variation in the average body mass index subjects in the inner city and out city locations.

Based on the data provided, the average body mass index of inner-city youngsters is noteworthily better than that of out-city youngsters, and out-city youngsters find the body mass index more consistent assessment to the low cumulative value (CV) of inner-city youngsters.

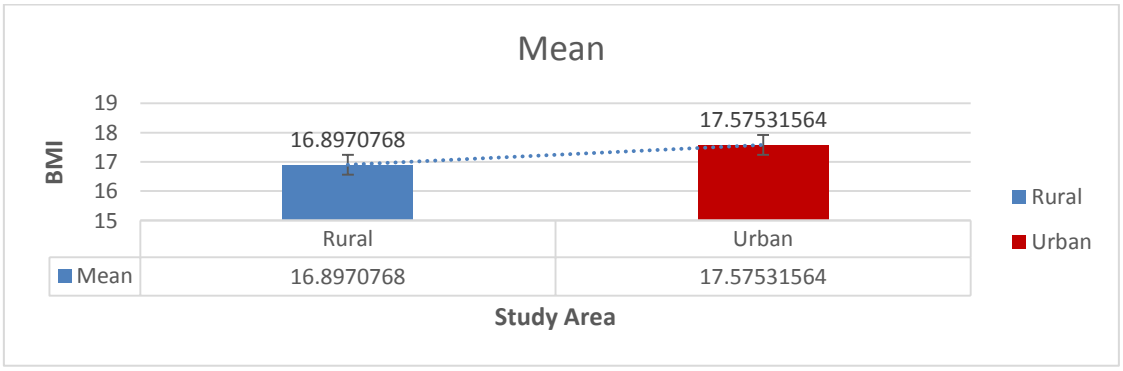
Table 1.5 Group Statistics by body mass index

	Total / Group	N	Mean	Std. Deviation	c.v
BMI	Total	500	17.2362	2.10185	12.19%
	Out-city	250	16.8971	1.79697	10.63%
	Inner-city	250	17.5753	2.32234	13.21%

Table: No 1.6: Comparative analysis of BMI between Out-city and Inner-city youngsters

T	df	Sig. (2-tailed)	Mean Variation	Std. Error Variation	95% Confidence Interval of the Variation	
					Lower	Upper
-3.652	498	.000	-.67824	.18571	-1.04312	-.31336

Graph 1.3: Graphic description of two means of inner-city and out city youngsters concerning BODY MASS INDEX



Norm wise Analysis of inner-city and out city youngsters:

The table shows the normative distribution of youngsters living in both out-city and inner-city locations of the CP. Of the 500 youngsters aged six to ten, 329 (65.8%) appear to have a normal body mass index. Of the remaining 171 youngsters, 115 (23%) were in the overweight category, while only 49 (9.8%) were obese, while 7 youngsters (1.4%) appear to be underweight. Based on the data analysis, it can be concluded that the body shape of most youngsters is normal and 32.8% of cases in the overweight and obese categories must perform physical activities such as sports and exercise.

Table: 1.7: Distribution of total sample as per norms

Total	UW	N	OW	OB
500	7	329	115	49
%age	1.4%	65.8%	23%	9.8%

To assess both inner city and out city youngsters, it was 74% in out-city locations, while 57.6% in inner-city locations appeared normal. 2.4% of underweight youngsters were in out-city locations and 0.4% in inner-city locations. 29.6% of overweight youngsters were found in inner-city locations and 16.4% in out-city locations. Besides, 12.4% of obese youngsters were found in inner-city locations, assessed to only 7.2% in out-city locations (Table 1.8).

Table 1.8: Comparison of out-city and inner-city youngsters n= 500 (%)

Total	Inner-city/Out-city	UW	N	OW	OB
Inner-city	250	6	185	41	18
Out-city	250	1	144	74	31
Inner-city%	%age	2.4%	74%	16.4%	7.2%
Out-city%	%age	0.4%	57.6%	29.6%	12.4%

Discussion

It is reflected by this investigational work that the variation in stature/tallness between inner city and out-city youngsters was not noteworthy while the bodyweight seemed substantially dissimilar in the subjects of both locations. A noteworthy figure of youngsters in the inner-city was found bulky and plump as compared to their counterparts in the out-city location. The consistency in the body mass index of out-city youngsters also favors the health of out-city youngsters. It was found that the number of skinny youngsters in both the inner city and our city locations was nearly trivial.

The analysis discovered a relatively better body mass index in inner-city youngsters. The striking characteristics of the inner city and out city environment, as well as lifestyle, appear to have a decisive influence on the composition of physical education where youngsters are raised (de Barros et al., 2003; Hussain, 2018). It was noted that the anthropometric data put effects on youngsters' growth due to ecological influences. Tomiyama et al. (2016) suggest that body mass index indicates body fitness for most individuals, as the fitness of out-city youngsters in fitness and the lower order of fitness of inner-city youngsters in terms of body composition are noteworthy. The increased fat content in the body becomes bulkiness and flabbiness harms the child's total presentation as well as the child's wellbeing and bodily form. (Romero-Corral et al., 2008) show that obese and overweight youngsters have poorer fitness levels than healthy and normal body mass index levels. This study is consistent with Rosvold (2019), who found that out-city youngsters have better physical fitness than inner-city youngsters. So, the superiority of body mass index and fitness in out-city youngsters is noteworthy

The findings of the investigational endeavor were also discussed in a focus group who felt: These considerations can be eliminated as a standard of living as well as a lifestyle for people living in inner-city locations. The standard of living consists of nutrition and routines activities used in the special atmosphere of the areas. It is well proven that the standard of living in cities is typically extravagant and luxurious, with a flavor of fast food, rice, meat, and roasts. In addition to these, inner-city youngsters do not find many opportunities to spend their excess strength, which can damage their bodies, growing their body load and size. The dearth of leisure places in Khyber Pakhtunkhwa tends to hamper their movement, which can act as a disadvantage. Huge locations and a pleasant environment also promote healthy body mass index in out-city youngsters. Therefore, all these aspects together support the foundation of flabbiness and crapulence on the part of inner-city youngsters. Nevertheless, an increase in body mass index in youngsters can also cause several health deficiencies.

Conclusion

The average body mass index of elementary educational institution youngsters in both inner city and out city locations is 17.24 Kg / m2 and the STD is 2.10. The body mass index of youngsters aged 6–10 in inner-city locations is better than in out-city locations. It is a matter of concern that the proportion of overweight and obese youngsters is better in inner-city locations than in out-city locations. Such variations in body mass index may be due to the lifestyle and environment in which these youngsters live and grow. Another factor that can cause such a change is the variation in nutrients between inner city and out city locations.

Declaration of Conflicting Interests

The author did not report any potential conflicts of interest concerning research, authorship, and publication.

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