



# “Relationship between Body Mass Index and Academic Achievement of Secondary Students”

Mousumi Mondal\*

Bijan Sarkar\*\*

*\*Student, Dept. of Education, University of Kalyani, West Bengal*

*\*\*Professor, Dept. of Education, University of Kalyani, West Bengal.*

## Abstract

Nowadays overweight and underweight are two major problems in national and international scenario. The degree to which a person is overweight or underweight is generally described by his/her Body Mass Index (BMI). The researcher was intended herself to find out whether BMI influences academic achievement of the secondary school students. If there exist any relation between BMI and academic achievement, then students will remain conscious about their performance. Guardian and teachers can also make themselves aware about students' body weight. BMI and academic achievement were considered as the variables of the study. The researcher selected 226 students of class IX and X from the district of North 24 Parganas of West Bengal as sample of the study. To measure academic achievement the researcher has considered the marks obtained by the student in their last examination passed. BMI was calculated from height and weight ratio of the students by Stadiometer and Weighing machine respectively. On the basis of statistical analysis and interpretation it was found that academic achievement is not influenced by BMI of the learners. Yet there was no correlation between BMI and academic achievement, students are recommended to maintain their BMI within normal value to prevent various health problems.

*Key words: Body Mass Index, Academic Achievement, Stadiometer*

## INTRODUCTION:

World is expeditiously blooming now. As a result in social, cultural, economical, political arena human are acclimatize themselves to different lifestyle. In modern life schedule people are very busy with different types of work and they do not care about their health. Due to changing globe pattern underweight, overweight, obesity has come into view as most blazing problem in the world. Body Mass Index (BMI) is a numerical value that indicates the health pattern and status of a person. It is defined as the body mass divided by the square of the body height, and is universally expressed in units of  $\text{kg/m}^2$ , resulting from mass in kilograms and height in metres. BMI classification according to WHO is presented below.

### The International Classification of adult underweight, overweight and obesity according to BMI

Classification	BMI( $\text{kg/m}^2$ )	
	Principal cut-off points	Additional cut-off points
<b>Underweight</b>	<b>&lt;18.50</b>	<b>&lt;18.50</b>
Severe thinness	<16.00	<16.00
Moderate thinness	16.00 - 16.99	16.00 - 16.99
Mild thinness	17.00 - 18.49	17.00 - 18.49
<b>Normal range</b>	<b>18.50 - 24.99</b>	<b>18.50 - 22.99</b>
		<b>23.00 - 24.99</b>
<b>Overweight</b>	<b><math>\geq 25.00</math></b>	<b><math>\geq 25.00</math></b>
Pre-obese	25.00 - 29.99	25.00 - 27.49
		27.50 - 29.99
<b>Obese</b>	<b><math>\geq 30.00</math></b>	<b><math>\geq 30.00</math></b>
		<b><math>\geq 30.00</math></b>
Obese class I	30.00 - 34.99	30.00 - 32.49
		32.50 - 34.99
Obese class II	35.00 - 39.99	35.00 - 37.49
		37.50 - 39.99
Obese class III	$\geq 40.00$	$\geq 40.00$

Source: Adapted from WHO, 1995, WHO, 2000 and WHO 2004.

Several study in India and abroad showed that BMI has an influence or no influence on academic achievement among school students. There was no correlation between the BMI and school performance, except in physics results where obese students perform worse than normal-weight students (Khaled A. Alswat, 2017)

## 2. OBJECTIVE OF THE STUDY:

The objective of the study that the researcher considered:

- i) To find out the relationship between overweight with the academic achievement of secondary school learners.
- ii) To find out the relationship between normal weight with the academic achievement of secondary school learners.
- iii) To find out the relationship between underweight with the academic achievement of secondary school learners.
- iv) To measure the Body Mass Index and academic achievement of secondary school learners.

## 3. HYPOTHESIS OF THE STUDY:

The researcher had formulated the following hypothesis for the study-

- H<sub>0.1</sub> : There is no significant relationship between BMI & Academic Achievement of secondary school learners.
- H<sub>0.2</sub> : There is no significant relationship between BMI & Academic Achievement of secondary boys.
- H<sub>0.3</sub> : There is no significant relationship between BMI & Academic Achievement of secondary girls.
- H<sub>0.4</sub> : There is no significant relationship between BMI & Academic Achievement of overweight secondary boys.
- H<sub>0.5</sub> : There is no significant relationship between BMI & Academic Achievement of overweight secondary girls.
- H<sub>0.6</sub> : There is no significant relationship between BMI & Academic Achievement of normal weight secondary boys.
- H<sub>0.7</sub> : There is no significant relationship between BMI & Academic Achievement of normal weight secondary girls.
- H<sub>0.8</sub> : There is no significant relationship between BMI & Academic Achievement of underweight secondary boys.
- H<sub>0.9</sub> : There is no significant relationship between BMI & Academic Achievement of underweight secondary girls.

## 4. METHOD AND MATERIALS:

This study was quantitative and survey type in nature.

**4.1 Variables:** BMI and Academic achievement are considered as the variables of the study.

**4.2 Sample:** 226 students of Class IX and X from the district of North 24 Parganas, West Bengal were selected as the sample of the study.

**4.3 Tools used:** to measure academic achievement the researcher had considered the marks obtained by the student in last examination passed. BMI was calculated from the ration of height and weight of the students by stadiometer and weighing machine respectively.

## ANALYSIS AND INTERPRETATION-

Table 1- Mean and SD of the subject according to their height, weight, BMI and Academic achievement

		Over weight		Normal weight		Under weight	
		Mean	SD	Mean	SD	Mean	SD
Height	boys	150.30	6.42	156.60	9.69	150.20	9.44
	girls	152.52	6.52	152.36	5.82	148.41	4.91
Weight	boys	61.58	5.90	49.41	7.29	37.58	7.14
	girls	61.58	7.92	47.63	5.01	36.65	4.03
BMI	boys	24.11	0.48	20.08	1.24	15.91	1.65
	girls	26.60	1.84	20.53	1.46	16.30	1.30
Academic achievement	boys	52.51	9.27	51.28	14.10	49.35	13.64
	girls	54.11	11.40	57.14	15.36	55.58	13.77

Table 2: correlation value of BMI and Academic Achievement (AA) of secondary learners

	Correlation (r) value
BMI & AA	0.070

The calculated value is less than the table value (0.138). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of secondary school learners.

Table 3 correlation value of BMI and Academic Achievement (AA) of secondary boys

	Correlation (r) value
BMI & AA	0.108

The calculated value is less than the table value (0.195). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of secondary boys.

Table 4: correlation value of BMI and Academic Achievement (AA) of secondary girls

	Correlation (r) value
BMI & AA	0.037

The calculated value is less than the table value (0.174). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of secondary girls.

Table 5: correlation value of BMI and Academic Achievement (AA) of Overweight secondary boys

	Correlation (r) value
BMI & AA	0.238

The calculated value is less than the table value (0.497). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of overweight secondary boys.

Table 6: correlation value of BMI and Academic Achievement (AA) of Overweight secondary girls

	Correlation (r) value
BMI & AA	0.184

The calculated value is less than the table value (0.482). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and social adjustment score of overweight secondary girls.

Table 7: correlation value of BMI and Academic Achievement (AA) of Normal weight secondary boys

	Correlation (r) value
BMI & AA	-0.078

The calculated value is less than the table value (0.325). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of normal weight secondary boys.

Table 8: correlation value of BMI and Academic Achievement (AA) of Normal weight secondary girls

	Correlation (r) value
BMI & AA	0.287

The calculated value is less than the table value (0.325). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of normal weight secondary girls.

Table 9: correlation value of BMI and Academic Achievement (AA) of Underweight secondary boys

	Correlation (r) value
BMI & AA	-0.029

The calculated value is less than the table value (0.273). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of underweight secondary boys.

Table 10: correlation value of BMI and Academic Achievement (AA) of Underweight secondary girls

	Correlation (r) value
BMI & AA	0.099

The calculated value is less than the table value (0.232). Therefore the value is not significant and the null hypothesis is accepted. Therefore the researcher concluded that, there is no significant relationship between body mass index and academic achievement of underweight secondary girls.

## Conclusion:

**Naticchioni,K.(2013)** in his study “The Relationship between Obesity and Academic Achievement of School – Age Children” found that, the relationship between obesity and academic achievement was statistically significant.

**Abede,F., Geleto,A., et.al (2017)** in their survey based study “Predictors of academic performances with due focus on under nutrition among students attending primary schools of Hawa Gelan district, South-West Ethiopia: a school based cross sectional study”, concluded that stunting and underweight were found to be correlated with academic performance of students attending primary schools.

**Rashmi,M.R., Shweta,B.M. et.al (2015)** in their survey based study “Prevalence of malnutrition and relationship with scholastic performance among primary and secondary school children in two selected private schools

in Bangalore rural district (India)” concluded that, the malnutrition status of the children is strongly associated with their academic performance.

But on the basis of the present statistical analysis and interpretation it was found that there is no significant relationship between BMI and Academic Achievement. So parents and teachers are requested not be worried about student’s BMI for better academic performance. Yet cognitive development is not influenced by BMI but, for the all round development of the students it is necessary to maintain their BMI into normal range.

## REFERENCES:

Alswat,K.A, Al-shehri.A.A., Aljuaid,T.A., Alzaidi,B.A., Hassan,D.& Alasmari,H.D. (2017). The association between body mass index and academic performance, Saudi Med J, 38 (2).

Atare,U.F., T,N.A.(2014). Body Mass Index and Academic Performance of Undergraduate University Students, 3.

Chauhan,S.S. (1983). *Advanced Educational Psychology*. Vikas Publishing House.

Crosnoe,R. & Muller,C.(2004). Body Mass Index, Academic Achievement, and School Context: Examining the Educational Experiences of Adolescents at Risk of Obesity, Austin Journal of Health and Social Behavior, 45, 393-407.

Garrett,H.E. (2007). *Statistics in Psychology and Education*. New Delhi: Paragon International Publishers.

Heshmat,R., Larijani,F.A., Pourabbasi,A. et al.(2014). Do overweight students have lower academic performance than their classmates? A pilot cross sectional study in a middle school in Tehran, J Diabetes Metab Disord, 13: 87. doi:10.1186/s40200-014-0087-0.

Kaul,L.(1997). *Advanced Educational Psychology* (2<sup>nd</sup> ed.). New Delhi: Prentice Hall of India Pvt. Ltd.

Khaled,A.Alswat et.al (2017), The Association between Body Mass Index and Academic Performance, Soudi Medical Journal, 38(2), 186-191.

Kim,J.H., Young.W.S. (2013). Association between Overweight/Obesity and Academic Performance In South Korean Adolescents, Cent Eur J Public Health, 21(4), 179–183.



Mangal,S.K.(2002)*Statistics in Psychology and Education* (2<sup>nd</sup> ed.). New Delhi: Prentice Hall of India Pvt. Ltd.

Naticchioni, K.(2013). The Relationship between Obesity and Academic Achievement of School-Age Children, Senior Honors Projects. Paper 9.

Thompson,J.K.F.(2013). The Relationship between Middle Childhood Body Mass Index, Stress, Physical Activity, and Academic Achievement, Education Theses, Dissertations and Projects. Paper 47.

Young,P.V. (1968) *Scientific Social Survey and Research* (4<sup>th</sup> ed.) New Delhi: Prentice Hall of India Pvt. Ltd.

