



Correlates of Health Status and Intelligence of High Achievers of High School Students

K. Anand

Assistant Professor in Physical Science, Krishnasamy College of Education for Women, Manapattu, Bahour Commune, Pondicherry607 402.

ABSTRACT

Many accounts have been given on the relationship between health variables and intellectual development. Many studies have reported significant findings between health status indicators and cognitive test scores. The performance of mental ability of pupils with good health status were significantly higher than those of pupils with poor nutritional or health status as a whole. It is therefore essential in the Indian context to obtain as much information as possible to find out if there are any inter-relationships between Body Mass Index, Basal Metabolic Rate, Body fat percentage and intelligence.

KEYWORDS : Intelligence, achievement, Health status: Body Mass Index (BMI), Basal Metabolic Rate(BMR) and Body Fat

INTRODUCTION:

In an educational and intellectual process, the individual depends on various factors and more important to his or her health for their achievement. The several studies gave on the relationship between under nutrition, wasting, stunting and academic achievement (Cueto, 2005; Ivanovic et al., 2004; Mukudi, 2003; Themane et al., 2003; Ivanovic et al., 1996; Pollit, 1990). All these studies have reported significant findings between nutritional status indicators and cognitive test scores. This article correlates the relationship of health status (height, weight, age, Body Mass Index, Basal Metabolic Rate, and Body Fat percentage) of individual and their respective intelligence (verbal & non-verbal)

NEED OF THE STUDY:

The normal or good health makes critical contribution to student intelligence. If there is good health strategy then intelligence should be better. This study also emphasizes that "hungry children cannot study well". The nature of high achievement and intelligence is based on health status. The study is also identifying correlational evidence in support of a positive relationship between good health status and their intelligence of the student.

Tershakovec and associates found that the proportion of obese children requiring special or remedial education was twice that for children who were not obese. Similarly, Falkner et al examined and found that overweight children had significantly lower math and reading test scores compared to non-overweight children in kindergarten;

All of these findings raise further questions about the possibly interacting influences of psychological variables such as intelligence in the relationship between obesity and academic achievement.

IMPORTANCE OF THE STUDY:

This study is helpful to identifying how the high achiever's performance in their intelligence level. It investigates the health status of high academic achiever which helps to increasing the potential of academic performance by providing proper guidance to improve their Health status.

STATEMENT OF THE RESEARCH:

The present investigation was entitled as "Correlates of Health Status and intelligence of high achievers of high school students".

OBJECTIVES OF THE STUDY:

- To measure Intelligence of high academic achievers of high school students.
- To measure Height and weight of high academic achievers of each grade and calculate the BMI, BMR and BF% of high academic achievers of high school students using Height and weight.
- To find out relationship between Intelligence, and health status of high achievers of high school students.

HYPOTHESES OF THE STUDY:

- There will be significant relationship between Intelligence with respect to BMI of high school students.
- There will be significant relationship between Intelligence with respect to Body Fat percentage of high school students (male and female).
- There will be significant relationship between Intelligence with respect to Basal metabolic rate of high school students.
- There will be no significant difference between boys and girls in terms of Intelligence and BMI.
- There will be no significant difference in Intelligence with respect to different age group of the high school students

METHOD OF STUDY:

Descriptive survey method has been used for Correlates of Health Status, intelligence of high achievers at high school students.

VARIABLES USED IN THE STUDY:

The important variables used in this research study are BMI, BMR, BF% and the Intelligence.

SELECTION OF THE SAMPLE:

The investigator has selected purposive cluster sampling techniques for the selection of the sample. The researcher has collected 194 samples for this study, who has secured top 5 rankers from class of every standard (Grade 6th, 7th, 8th, 9th, 10th) among six different schools. [Central, state and private schools in Puducherry]

TOOLS USED FOR THE STUDY:

1. "Mixed type group test of intelligence verbal & non-verbal (age group 10 - 18)" constructed and standardized by Dr. P. N. Mehrotra.
2. Electronic weigh machine and Standard inch & meter scale for measuring the weight and height of the of the sample

INTELLIGENT QUOTIENT: (Table 1)

Sl. No	Classification of Intelligence	Deviation I.Q. Limit
1	Very superior	130 and above
2	Superior	120-130
3	Bright Average	110-120
4	Average	90-110
5	Dull Average	80-90
6	Inferior	70-80
7	Very Inferior	70 and below

BMI CATEGORIES (Table 2)

Sl. No	BMI	Rating
1	18.5 or less	Underweight
2	18.5 to 24.9	Normal Weight
3	25.0 to 25.9	Overweight
4	30.0 to 39.9	Obese
5	40 or greater	Extremely Obese

BODY FAT% CATEGORIES (Table 3)

Sl. No	Body Fat Percentage Categories		
	Classification	Female (% fat)	Male (% fat)
1	Essential Fat	10-12%	2-4%
2	Athletes	14-20%	6-13%
3	Fitness	21-24%	14-17%
4	Acceptable	25-31%	18-25%
5	Obese	32%+	25%+

STATISTICAL TECHNIQUES USED IN THE STUDY:

Descriptive statistics like Mean, Median, Mode, Standard deviation of intelligence, academic achievement and Health status (BMI, BMR and BF%) are worked out for the total sample.

Calculating the Correlation by the Pearson product-moment correlation coefficient.

Analysis of Variance (ANOVA).

Test of significance of difference between Means of intelligence, Health status in terms of Gender variation.

DESCRIPTIVE ANALYSIS (Table 4)

Variables	Range	Min	Max	Mean	median	Mode	Std. Deviation
Intelligence	69	84	153	123.78	124.95	126	12.87
BMI	15.98	12.27	28.25	17.9316	17.3586	16.67	3.027
BMR	881.43	975.48	1856.91	1278.4559	1265.95	1357.20	142.64
BF% (female)	22	12	34	19.39	19.4	23	4.422
BF% (male)	18	9	27	15.63	14.10	9	4.56

The mean, median, mode and ($M \pm 1\sigma$) of Intelligence scores show that most of the sample falls (110 to 137) in the category of Bright average to very Superior. The mean, median, mode and ($M \pm 1\sigma$) of Body Mass Index (BMI) scores show that most of the sample falls (15 to 21) in Underweight (18.5 or less) and Normal weight (18.5 to 24.9) category. The Basal Metabolic Rate (BMR) shows that approximately 1300 calories are needed for an individual to be active. The mean, mode and Median of female Body fat percentage shows that most of them fall between 15 to 24 % and male Body fat percentage shows that most of them fall between 11 to 20%. Therefore, Body fat percentage of male and female distributed evenly in different categories.

MAJOR FINDINGS OF THE STUDY:

1. There is no significant relationship between intelligence with respect to BMI of high school students.

The calculated ($r = 0.0513$) value of BMI and Intelligence is less than the table value (.138) at .05 level, it concludes that there is no correlation between BMI and Intelligence at 0.05 level. Therefore, the given parameter of the test accepts the null hypothesis.

2. There is no significant relationship between Intelligence with respect to Body Fat percentage of the students (female).

The calculated ($r = 0.0636$) value of female BF% and Intelligence is less than the table value (.159) at .05 level, it concludes that there is no correlation between female BF% and Intelligence at 0.05 level.

Therefore, the given parameter of the test accepts the null hypothesis.

3. There is no significant relationship between Intelligence with respect to Body Fat percentage of the students (male).

The calculated ($r = -0.0373$) value of male BF% and Intelligence is less than the table value (.159) at .05 level, it concludes that there is no correlation between male BF% and Intelligence at 0.05 level. Therefore, the given parameter of the test accepts the null hypothesis.

4. There is no significant relationship between Intelligence with respect to Basal metabolic rate of the students.

The calculated ($r = 0.114$) value of BMR and Academic achievement is less than the table value (.138) at .05 level, it concludes that there is no correlation between BMR and Intelligence at 0.05 level. Therefore, the given parameter of the test accepts the null hypothesis.

5. There is no significant difference between girls and boys with respect to their intelligence.

The calculated 't' value is 0.6544. It is lesser than the table value 1.97 at 0.05 level. Hence the framed null hypothesis is accepted and there is no significance difference between male and female student with respect to their Intelligence.

6. There is no significant difference between girls and boys in their Body Mass Index.

The calculated 't' value is 0.3105. It is lesser than the table value 1.97 at 0.05 level. Hence the framed null hypothesis is accepted and there is no significance difference between male and female student with respect to their Body Mass Index

7. There is no significant difference in intelligence with respect to different age group of the students

The calculated 'F' value is 1.624. It is lesser than the table value 2.26 at 0.05 level. Hence the framed null hypothesis is accepted and there is no significant difference in intelligence with respect to different age group of the students.

CONCLUSION:

Intelligence scores show that most of the high school students fall in the category of Bright average to very Superior. Body Mass Index scores show that most of the sample falls in Underweight and Normal weight category. The Basal Metabolic Rate shows that approximately 1300 calories are needed for an individual to be active. Female Body fat percentage scores shows that most of them fall between 15 to 24 % and male Body fat percentage scores shows that most of them fall between 11 to 20%. Therefore, Body fat percentage scores of male and female are distributed evenly in different categories.

BMI, BMR and BF% of high school students does not have any relation with Intelligence. Therefore, Intelligence is not influenced by Body Fat percentage, Basal Metabolic Rate and Body Mass index with respect to high school students. Intelligence and Body Mass Index are not influenced by gender. Age is not influenced on Intelligence of high school students. But, Bright average to very Superior Intelligence category of the high school students got 74 to 95% marks in their academic examination.

EDUCATIONAL IMPLICATION:

More attention should be given to health status of school students by providing nutritional food tips by organizing health based workshops to the school children to make them healthy and prevent from obese. Because obese children do not perform well in intelligence test and they are below average in academic performance.

Playing outdoor games and daily exercises make them fit and strong. So curriculum should emphasis physical education in all primary, high school and higher secondary school level.

Provide importance to physical and mental reasoning exercise of school students to avoid stress in learning and concept formation in any subject of that matter.

SUGGESTIONS FOR FURTHER STUDY:

A study can be conducted at different regional areas
A study may be under taken at different levels such as primary, higher secondary and college level.
A study may be conducted to find out the relation of intelligence and health status among rural and urban students

REFERENCES

- [1]Kapil, Umesh, et al. (2002). Prevalence of obesity amongst affluent adolescent school children in Delhi. *Indian Pediatrics*, 39(5): 449-52. | [2]Jhingan, A. K. (2005). Increase in incidence of childhood obesity in school children: A study of schools in Delhi. New Delhi: Delhi Diabetes Research Centre. 5 p | [3]G. Srihari, and S. Seshadri (2007). Nutritional Status of Affluent Indian School Children: What and How Much Do We Know? *INDIAN PEDIATRICS VOLUME 44 MARCH 17, 2007* | [4]Subramanyam and Vedavati (2003). Prevalence of overweight and obesity in affluent adolescent girls in Chennai in 1981 & 1998. *Indian Pediatrics*, 40(4): 332-36. | [5]Hedwig Acham, Joyce K. Kikafunda, Silas Oluka (2007). Height, weight, body mass index and learning achievement in Kumi district, East of Uganda; *Scientific Research and Essay Vol. 3 (1)*, pp. 001-008, January 2008. | [6]G. Rampersaud (2005); Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *Journal of the American Dietetic Association*, 105(5): 743-760. 2005. | [7]Gottfredson, L.S. (1997). "Foreword to Intelligence and social policy" | [10]Howard E. Gardner (1993) "Frames of mind: The theory of multiple intelligences. New York: Basic Books. ISBN 0465025102 | [8]Wechsler, D (1944). "The measurement of adult intelligence, Baltimore": Williams & Wilkins. ISBN 0195022963 | [9]Henry E. Garrett and R. S. Woodworth(2008), "Statistics in Psychology and Education" Jurjeet Publication, delhi. | [10]Dr. P. N. Mehrotra "Manual for Mixed Type group test of Intelligence(verbal and Non-verbal)" | [11]Kumar, Ranjit, (2005), *Research Methodology-A Step-by-Step Guide for beginners*,(2nd.ed.), Singapore, Pearson Education | [12]David H. Alpers, William F Stenson, Beth Taylor, Dennis M Bier "Manual of nutritional therapeutics" ISBN-13: 978-0-7817-6841-2. |