

Association between overweight and academic achievement among affluent school children in Allahabad

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■ **ABSTRACT** : Psychological and social health problems related to overweight may affect academic achievement of overweight children. The purpose of the present study was to assess the relationship between overweight and academic achievement in school children. A total of 330, school children studying between 6th and 10th standard aged between 11 to 16 years were studied from two affluent schools of Allahabad city- Maharshi Patanjali Vidya Mandir and Tagore Public School. Children with BMI between 85th and 95th percentile were considered as overweight. 165 identified overweight children as cases and 165 normal weight children as controls were selected. While selecting controls, it was kept in mind to maintain the similarity of age, gender and standard between case and control. Cumulative Grade Point Average (CGPA) along with Math and English grades were recorded from the school register to evaluate the academic achievement of children. Chi square test was used for statistical analysis. Findings of the study reveal that there is no significant difference ($p>0.05$) between cases and controls with respect to grades achieved in CGPA, Math and English in both boys and girls. Overall, overweight was not found significantly associated to children's academic achievement. More research studies are required to further explore the relationship between excess body weight and academic achievement

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Overweight children and adolescents are at risk for significant health problems, including insulin resistance, increase blood pressure, asthma, high cholesterol, obstructive sleep apnea syndrome and psychosocial problems (Flint *et al.*, 2007; Unger *et al.*, 1990; Steinberger, 1995; Bergstrom *et al.*, 1996 and Must and Strauss, 1996). Moreover, being overweight or obese is associated with low self esteem, negative body image,

depression and being teased or bullied (Friedlander *et al.*, 2003; Storch *et al.*, 2007 and Strauss, 2000). These psychological and social health problems related to overweight may affect academic achievement of overweight children. Good academic achievement is directly related to good scoring in various entrance examination and job opportunities therefore it has been always a matter of concern for both parents as well as

students (Kim *et al.*, 2003).

There is converging interest among public health scientist and school policy makers in the health status of adolescents and its impact on their academic achievement (Sigfusdottir *et al.*, 2007). Majority of the existing studies that examined the association between overweight and academic achievement have been conducted in western countries and a very few studies have been conducted in India.

Recently, a study conducted in Allahabad by Bansal *et al.* (2015) reported high prevalence of overweight (19.5%) among affluent school children. Thus, there is a need to conduct further study in order to understand the relation between overweight and academic achievement. To our knowledge, relevant study in this area, has not been done in Allahabad. Therefore, the present study is carried out to assess the association between overweight and academic achievement among school going children.

■ RESEARCH METHODS

A total numbers of 330 school children studying between 6th to 10th standard aged 11 to 16 years were selected from two affluent schools (Maharshi Patanjali Vidya Mandir and Tagore Public School) of Allahabad city.

Procedure:

The present study is continuation of our previous findings published as Bansal *et al.* (2015). In this study, 165 identified overweight children as cases and 165 normal weight children as controls were selected. While selecting controls, it was kept in mind to maintain the similarity of age, gender and standard between case and control. Children with BMI between 85th and 95th percentile were considered as overweight. To evaluate the academic achievement of children Cumulative Grade Point Average (CGPA) along with Math and English grades were collected from the school records. Grades were categorized as following: A1 = Excellent, A2 = Very Good, B1= Good, B2 = Average, C1 or below C1 =Poor.

Statistical analysis:

The collected data was analyzed by Chi-square test. $P < 0.05$ was considered as statistically significant.

■ RESEARCH FINDINGS AND DISCUSSION

Total numbers of 330 children aged between 11 to 16 years from 6th to 10th standard were studied. Out of them 58.2 per cent (192) were boys and 41.8 per cent (138) were girls.

Table 1 depicts a comparison between academic achievement of overweight boys and normal weight boys. It reveals that there is no significant difference ($p > 0.05$) between cases and controls with respect to grades achieved in CGPA, Math and English.

Table 2 depicts a comparison between academic achievement of overweight girls and normal weight girls. It reveals that there is no significant difference ($p > 0.05$) between cases and controls with respect to grades achieved in CGPA, Math and English.

Overall, overweight was not found significantly associated to children's academic achievement. Kaestner and Grossman (2008) in the US investigated the association between weight and educational achievement in children between the ages of 5 and 12 and suggested that children who are overweight or obese have achievement test scores that are about the same as children with average weight. Similar findings were found in adolescents between the ages of 14 and 18 by Kaestner *et al.* (2009). Another study by Baxter *et al.* (2013) reported that there is no relationship between academic achievement and body mass index among fourth grade, African American children.

However, there are several studies that found a negative relationship between overweight and academic achievement in children. Mo-Suwan *et al.* (1999) found that there is association between overweight status and poor school performance among 587 Thai children from grades 7 to 9. Similarly, Stuart (2008) reported that overweight students achieved lower grades than their non-overweight peers among 566 6th and 7th grades of Americans. In South Korean adolescents from grades 7 to 12 overweight was found negatively associated with academic performance by Kim and So (2013). In the U.S Datar *et al.* (2004) found that overweight children had significantly lower math and reading scores compared with non overweight children in Kindergarten that persisted through end of first grade.

There are various methods used to assess children's school performance such as standardized test scores, IQ tests, grade rank, grade point average and absenteeism rate. Average grade point in core academic subjects

Table 1 : Distribution of different grades achieved by cases and controls in CGPA, Math and English among boys

Category	Excellent (%)	Very good (%)	Good (%)	Average (%)	Poor (%)	X ²	P value
CGPA							
Cases (96)	12 (12.5)	18 (18.8)	15 (15.6)	30 (31.3)	21 (21.8)	4.20	0.38
Controls (96)	12 (12.5)	23 (23.9)	23 (23.9)	22 (22.9)	16 (16.8)		
Math							
Cases (96)	17 (17.7)	16 (16.7)	17 (17.7)	12 (12.5)	34 (35.4)	2.02	0.73
Controls (96)	15 (15.6)	22 (22.9)	19 (19.8)	13 (13.5)	27 (28.2)		
English							
Cases (96)	10 (10.4)	21 (21.8)	18 (18.8)	31 (32.2)	16 (16.7)	2.68	0.61
Controls (96)	7 (7.3)	20 (20.9)	21 (21.8)	25 (26.0)	23 (24.0)		

Table 2 : Distribution of different grades achieved by cases and controls in CGPA, Math and English among girls

Category	Excellent (%)	Very good (%)	Good (%)	Average (%)	Poor (%)	X ²	P value
CGPA							
Cases (69)	06 (8.7)	20 (30.0)	15 (21.7)	10 (14.5)	18 (26.1)	6.13	0.19
Controls (69)	12 (17.4)	15 (21.7)	17 (24.6)	15 (21.7)	10 (14.5)		
Math							
Cases (69)	08 (11.6)	11 (15.9)	14 (20.3)	12 (17.4)	24 (34.8)	0.73	0.94
Controls (69)	10 (14.5)	09 (13.0)	16 (23.2)	10 (14.5)	24 (34.8)		
English							
Cases (69)	06 (8.7)	21 (30.4)	19 (27.5)	14 (20.3)	09 (13.0)	2.57	0.63
Controls (69)	11 (15.9)	18 (26.2)	19 (27.5)	10 (14.5)	11 (15.9)		

including mathematics and English (foreign language) was used as a true proxy for school performance in the earlier studies by Sigfusdottir *et al.* (2007) and Huang *et al.* (2012). In the present study CGPA, Math and English grades were used to assess academic achievement of children.

Conclusion :

In the present study overweight was not found significantly associated to academic achievement in both boys and girls. More research studies are required to further explore the relationship between excess weight and academic achievement in children and adolescents.

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