

# Study on Relationship of Psychopathology on Childhood Obesity Among School Children in South India

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**Abstract:** Study on relationship of psychopathology on childhood obesity among school children in South India.

**Aim:** To study the relationship of psychopathology on obesity among school children of Davangere district, South India.

**Settings and Design:** School children studying in V-VII standard of Davangere dist in Karnataka, south India. Stage-I cross sectional study for identification of obese children. Stage-II Case control study to find out the relationship of psychopathology and obesity among school children.

**Material and Methods:** Body mass index (BMI) was calculated using BMI charts based on NCHS standards. 421 obese children and 842 controls (1:2 ratios) were studied by using Childhood Psychopathology Measurement Schedule (CPMS) tool developed and standardized by Malhotra *et al*.

**Statistical Analysis:** Data analysis was conducted at SPSS/ PC programme (Version 13).

**Results and Conclusions:** The psychopathology was present in 44.2% of obese children by using CPMS tool as against only 13.8% of non obese children. The presence of psychopathology among obese boys was more (59.5%) than obese girls (49.4%). The obese children had the relationship of psychopathology 4.9 times more than nonobese children. The positive association of psychopathology with obesity was present in both sexes. The association was found to be stronger for boys in comparison to girls. Our study findings show that psychopathology has strong relationship on obesity among school children and psychopathology has a definite impact on childhood obesity.

**Keywords:** Childhood obesity, Psychopathology, Childhood Psychopathology Measurement Schedule(CPMS), School children, South India.

## INTRODUCTION

Today childhood obesity is a matter of concern to the whole world. WHO (World Health Organisation) emphasizes the urgent need of understanding the prevalence trend and influencing factors of childhood obesity [1]. Though obesity is a product of imbalance between energy intake and energy output several factors such as psychological factors and genetic predisposition may trigger this energy imbalance. Obesity has social, psychological and emotional consequences. Apart from morbid risk obese children are treated differently. Obese child may feel isolated and lonely which can lead to self-esteem and identity problems [2].

Even a children as young as six years of age described the obese child as 'lazy', 'dirty' and 'stupid'. They are often the target of abuse by peers, are left out

of games and social activities and are teased and ridiculed. Some psychopathology having relationship on eating habits have been reported. Many people eat more in depression, boredom or sadness [3]. Psychological disorders like depression occurs with increased frequency in obese children [4]. The evidence on the psychological etiology of obesity on teens are piling up [5]. Poor family functioning including difficulties with parenting skills, parental distress and psychopathology is also associated with paediatric obesity [6-8].

Although the prevalence and the degree of obesity in childhood have increased, reactions to obesity remain stereotypical. There is still substantial disagreement concerning the psychological consequences of childhood obesity. There is a remarkable lack of studies (recent or not) regarding the presence of behavioral disturbances in obese children. However, there are no definitive data at this time that demonstrate a strong relationship between the onset of psychiatric disorders and obesity. The article makes an effort to understand the association of psychopathology

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and childhood obesity in the population of school children in southern India.

The aim of this research study is to study the relationship of psychopathology on obesity of school children in southern India.

## METHODOLOGY

The study was approved by ethical board of J.J.M. Medical College, Davangere, India.

33 middle schools in Davanagere district situated in Karnataka state, south India were randomly selected from the overall 272 schools. All students studying in these selected schools were eligible to be included into the study.

A cross sectional survey was conducted to identify the obese children. Each Child's height in centimeters and weight in kilograms were measured by adopting standard procedure. Height was determined by the use of length board. Participants were asked to remove the shoes and step in front of the height board placed on a flat floor with heels, buttocks, shoulders and back of the head touching the wall. While the head was comfortably erect with the lower boarder of the orbit in the horizontal plane and external auditory meatus and the arms hanging at the sides in a natural manner, the height was then measured and recorded to the nearest 0.1 cm. Weight was determined by using a digital weighing scale. Participants were asked to remove shoes and step on a zeroed digital weighing scale. The weight was then measure and recorded to the nearest 0.1kg. Body mass index (BMI) was calculated using BMI charts based on NCHS (National Center for Health Statistics), USA(United States of America) standards [9]. Height was measured in meters and weight was recorded in kilograms.

Body mass index (BMI) was calculated by using the formula:  $\frac{\text{Weight in Kilograms}}{\text{Height in meter}^2}$

### Age and gender specific to BMI cutoff point

Age in years	BMI CUTOFF POINT	
	Boys	Girls
10	22	23
11	23	24
12	24	25

A child was considered obese if the BMI was > 95<sup>th</sup> percentile cutoff point specific to the age and sex of the

child [9]. The same scales and stadiometers were used throughout the study. Thus out of 6472 children, 421 children were considered as obese based on BMI.

All obese children were considered as cases. For each obese child identified in the cross sectional survey two children of same age, sex, class and section was selected as control. To overcome the bias, non obese children having immediate proceeding and succeeding register number of the case were selected as controls.

### Case Control Study

After identifying 421 obese children (cases) and selecting 842 matching controls (1:2 ratio), parents of both cases and controls were invited to schools through school authorities on a specified date and time to the school. The purpose of the study was explained to parents and consent for their participation of children was sought.

To study the relationship of psychopathology of child on obesity, parents were asked to answer the Childhood Psychopathology Measurement Schedule (CPMS) developed and standardized by Malhotra *et al.* [10] which is widely used to identify the psychopathology of the children .Few parents who failed to turn up to schools were contacted in their house and data was collected. CPMS contained 74 questions pertaining to 8 factors *viz.* low intelligence with behavior problems, conduct disorders, anxiety, depression, psychotic symptoms, special symptoms, physical illness emotional problems and somatization. Each question was directed to the mother regarding the child's behaviour during past one year. These answers were scored on two-point scale i.e. '0' if that particular behavior is not present and '1', if present. Those children who scored a total of 10 or more on this score were considered positive for psychopathology and those scoring less than 10 were considered normal [11].

### Statistical Analysis

Data analysis was conducted at SPSS/ PC programme (version 13 USA). The results for continuous variables are given as Mean  $\pm$  Standard deviation and proportions as percentages. Chi-Square test was used for categorical data and Odds ratio was calculated wherever required. The difference between the groups was assessed by Z test for proportions. For

**Table 1: Association between Psychopathology and Obesity in School Children**

Psychopathological factors	Obese(Cases)		Nonobese (Controls)		Odds ratio
	Number	Percentage	Number	Percentage	
Present	186	44.2%	116	13.8%	4.95
Absent	235	55.8%	726	86.2%	
Total	421	100.0	842	100.0	

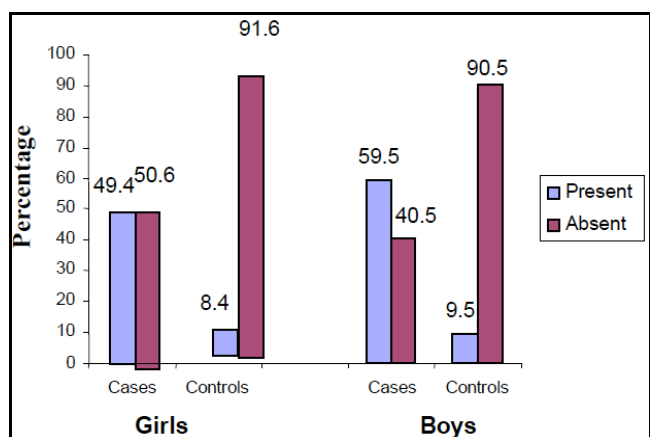
$\chi^2=142.6$ ,  $df=1$ ,  $P$  value  $< 0.001$  \* - Statically significant

all the tests  $P$  value of 0.05 or less was considered for statistical significance.

## RESULTS

Mean age for boys and girls was 11.7 and 11.6 years respectively. The mean BMI of boys was  $16.3 \pm 3.1$  and for girls it was  $16.9 \pm 3.7$ .

Psychopathology was present in 44.2 % ( 186) of obese children as against only 13.8 % ( 116) in nonobese children (Table 1 and Figure 1). This difference was significant statistically ( $P < 0.001$ ).



**Figure 1:** Association between psychopathology and obesity of children by sex.

When the association of psychopathology and obesity by sex was analysed. The psychopathology was present in 49.4%(114) of obese girls as against 8.4%(39) of non obese girls (Table 2). Among boys, the psychopathology was present in 59.5 % ( 113) of obese boys as against 9.5% ( 36) of non obese boys. Both these differences observed was significant statistically ( $P < 0.001$ ) (Table 3). The relationship of psychopathology on obesity was more in boys than in girls.

The relationship of psychopathology among obese children was 4.9 times more compared to nonobese children. The positive association of psychopathology

with obesity was present in both sexes. The association was found to be stronger for boys in comparison to girls.

## SUMMARY AND DISCUSSIONS

Recently an association of psychopathological relationship on childhood obesity has been postulated. Even though psychopathology are difficult to assess attempt is made here to know the relationship of psychopathology on obesity of children by using childhood psychopathology measurement schedule tool. The psychopathology was present in 44.2% of obese children as against only 13.8% of non obese children. The obese children had the relationship of psychopathology 4.9 times more than nonobese children. Prevalence rates of psychopathology reported by different studies on Indian children vary from 5.8% to 33.7% [12-15]. A study conducted by WHO in four developing countries (1981) including India in Haryana state showed prevalence of 21% [16]. A study by ICMR (Indian Council of Medical Research) in 2001 showed prevalence to be 13.4% in the age group 0-16 years [17].

The positive association of psychopathology with obesity was present in both sexes in comparison to nonobese children. The association was stronger for boys (59.5%) in comparison to girls (49.4%). Similar findings were found in several studies [12, 15, 17]. Manju Rahi study states that although no clear-cut reason has been established, yet it is felt that male preponderance may be due to psychological or biological factors [11]. Also, greater attention is often paid to the male children and the parents notice any abnormal behaviour earlier resulting in early reporting [17]. This could be because depression can lead to increase intake of food and thereby obesity in those child with presence of psychopathology.

Our finding suggests that there is strong association of psychopathology in obese children when compared

**Table 2: Association between Psychopathology and Obesity in Girls**

Psychopathological factors	Obese(Cases)		Nonobese (Controls)	
	Number	Percentage	Number	Percentage
Present	114	49.4	39	8.4
Absent	117	50.6	423	91.6
Total	231	100.0	462	100.0

$\chi^2=164.0$ ,  $df=1$ ,  $P$  value  $< 0.001$  \* - Statically significant.

**Table 3: Association between Psychopathology and Obesity in Boys**

Psychopathological factors	Obese(Cases)		Nonobese (Controls)	
	Number	Percentage	Number	Percentage
Present	113	59.5	36	9.5
Absent	77	40.5	344	90.5
Total	190	100.0	380	100.0

$\chi^2=149.8$ ,  $df=1$ ,  $P$  value  $< 0.001$  \* - Statically significant

to nonobese children. Our findings attest the significance of psychopathology in childhood obesity.

Studies showed that discrimination may account for important social consequences of obesity in childhood, adolescence, and later adulthood [18, 19]. The increased rate of psychopathology for the clinical obese group compared with the nonclinical group, can be explained as a perceiver effect [20]. In fact, the findings concerning psychopathology were based solely on perceptions of the parents.

The WHO Global Strategy on Diet, Physical Activity and Health recommends broad, comprehensive and coordinated public health efforts at national, regional and local levels including initiatives that reduce unhealthy eating and physical inactivity, and raise awareness around the relationship of diet and PA on health [21]. These strategies must be evidence-based, multisectoral, multidisciplinary and focused on life-course perspectives.

More research is required to understand the association of psychopathology and obesity in children. Follow-up studies of obese children could be helpful to test further the hypothesis on the relationship between obesity and psychopathology.

## CONCLUSIONS

Our study findings show that psychopathology has strong relationship with obesity of children. This study on a large scale sample has shown that psychopathology has a definite impact on childhood

obesity. These results do not imply that every obese child has the presence of psychopathological problems.

## ACKNOWLEDGEMENTS

We thank all the head of the institutions of the schools, teachers, school children and parents of Davangere district for their participation and cooperation in the study. Our sincere thanks to D.K. Sangam for statistical analysis of the study.

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Received on 03-12-2012

Accepted on 05-02-2013

Published on 28-02-2013

<http://dx.doi.org/10.6000/1929-4247.2013.02.01.6>