



PREVALENCE OF OVERWEIGHT AND OBESITY AMONG MIDDLE SCHOOL CHILDREN IN MINJUR BLOCK, THIRUVALLUR DISTRICT-TAMIL NADU

Community Medicine

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ABSTRACT

The high prevalence of obesity in adolescents is a serious public health concern. Lack of physical activity and unhealthy eating habits leads to obesity. Hence this study had been undertaken to estimate the prevalence of overweight and obesity and associated factors among middle school children. A cross sectional study of 365 randomly selected school children from 4 middle schools in Minjur block, using attendance register as sampling frame, was done during June to September 2017. Data collected using pretested questionnaire and anthropometric measurements were taken. There were 188 males and 177 females. Overall prevalence of obesity was 13% and overweight 12%. Factors significantly associated with overweight and obesity were taking junk foods, eating while watching television, not taking fruits and vegetables and lack of physical activity. Health education regarding good dietary habits should be imparted to prevent them from entering into the pool of obesity.

KEYWORDS

Obesity, junk foods, school children

INTRODUCTION

Overweight and obesity are defined as abnormal or excessive fat accumulation. A crude measure of obesity is the body mass index (BMI). A person with a BMI of 30 or more is considered obese and more than 25 is considered overweight (WHO criteria)⁽¹⁾.

Lower and middle income countries are facing double burden of disease with under-nutrition on one side and obesity on other side.⁽¹⁾⁽²⁾ Globally according to WHO (World Health Organisation) report, the prevalence of overweight and obesity among children and adolescents aged 5-19 had raised dramatically from 4% in 1975 to 18% in 2016. The rise was equal among boys and girls, where 18% of girls and 19% of boys were overweight. Overweight and obesity are associated with more deaths worldwide than underweight⁽¹⁾ Childhood obesity has major implications on non-communicable disease like diabetes mellitus, hypertension and cardiovascular disease in early adulthood.

According to a systematic review, prevalence of obesity in India was found to be 6.3%-10% among school children aged 6-12 years⁽²⁾. The prevalence was higher in northern and eastern India. According to a study conducted in Chennai it was found that nearly 4% and 22% of adolescent in government and private schools were obese respectively⁽³⁾.

Adolescence is a period for psychological, social and physical transaction between childhood and adulthood. One of the biggest questions guys and girls have as they grow and develop is whether they are of the right weight⁽³⁾.

The NFHS (National Family Health Survey) has data only for less than 5 years and above 15 years age, but no data was available on nutritional status of adolescent aged 11-14 years. Once obesity was considered a problem of urban area but now even the rural children are suffering from overweight and obesity due to urbanisation, faulty dietary patterns along with lower levels of physical activity. Bad eating practices are the root cause for the development of obesity. Eating habits are usually formed in early childhood and parents play a very important role in their development⁽⁴⁾. Hence this study had been undertaken among rural middle school children aged 11-14 years with the objective to estimate the prevalence of overweight and obesity and to find the association between dietary habits, physical activity and obesity.

MATERIALS AND METHODS

A cross sectional study was conducted among middle school children in Minjur block of Thiruvallur district, Tamil Nadu during June to September 2017. With the estimated prevalence (p) of obesity among school children as 18%⁽¹⁾, absolute precision (d) 4%, and at 95% confidence interval, the sample size was calculated using the formula $n = 4pd/d^2$ and it was calculated to be 354, finally 365 samples were collected. Two stage sampling technique was employed, in the first

stage, out of 7 government middle school 4 was selected by simple random sampling technique and from each school, children aged 11 to 14 were selected by simple random sampling using attendance register as sampling frame. Those who were absent at the time of study was excluded. Around 92 students were selected from each school. After obtaining institutional ethics committee approval and permission from Chief Education Officer of Thiruvallur district, school Head master and parents of the children, study was conducted using pre tested questionnaire which gathered information about basic details, eating habits, physical activity, perception of body image, and anthropometric measurements. Height and weight was measured using standardized inch tape and weighing machine respectively, finally BMI was calculated. Classification of obesity was based on body mass index (Asian standards) as Underweight : $<18.5 \text{ kg/m}^2$, Normal: $18.5 - 22.9 \text{ kg/m}^2$, Overweight: $23 - 24.9 \text{ kg/m}^2$, Obese: $\geq 25 \text{ kg/m}^2$. Collected data were entered in MS excel; analysis was done using statistical package for social science (SPSS) v16. Descriptive statistics was calculated for background variable. Prevalence of obesity was calculated with 95% CI. Chi square was used as test of significance. p value of <0.05 was considered to be statistically significant.

RESULTS:

Out of 365 study participants there were 188 males and 177 females. Mean age of study participants was 12 years. There were 150 and 173 students belonging to the age group 11-12 and 13-14 years respectively. Nearly 75% of their fathers and 61% of their mothers were literate. Mean (SD) weight and height of the study participants was 40(9) kg and 137(10) cms respectively. Mean (SD) BMI was 21(3.6) kg/m^2 . There was no difference in mean BMI between boys and girls and was found to be 21 kg/m^2 for boys and for 20.1 kg/m^2 girls.

The overall prevalence of overweight and obesity among the participants was 13% (95%CI 9.5%- 16.5%) and 12% (95% CI 8.6-15.4%) respectively (figure 1). There is no gender difference in overweight, obesity and underweight ($p>0.05$).

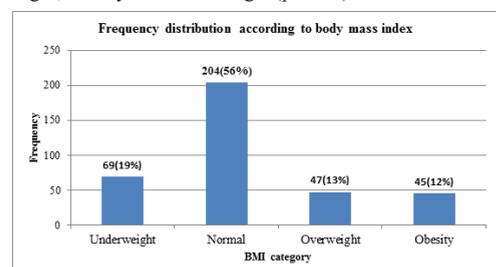


Figure 1: Distribution of study participants according to BMI category (N=365).

Among the study participants 72% consume fast foods. Frequency of consumption is shown in (Table 1). Among those who consume fast foods 30% were obese and those who do not consume fast food only 13% were obese. Nearly 63% consume soft drinks but there is no association between soft drink consumption and obesity.

Almost 79% students consume egg, 71% consume fruits, and 77% consume vegetables on daily basis. Majority of those who consume egg, fruits, vegetables and milk were found to have normal BMI. Those who do not consume these foods are mostly underweight ($p < 0.01$). Nearly three fourth of the students have the habit of doing regular physical activity for more than 30 minutes a day. More than half of the students have the habit of watching television while eating.

Table 1: Factors associated with obesity/overweight among study participants (N=365)

Factors	BMI category		Total (n=365)	Chi square	p value
	BMI ≥ 23 n (%)	BMI < 23 n (%)			
Frequency of fast food consumption #				135	0.003**
Often	39(42)	123(45)	162		
Sometimes	31(34)	97(36)	128		
Rare	20(22)	41(15)	61		
Never	02(2)	12(4)	14		
Playing outdoor games				58	0.001**
Yes	41(15)	231(85)	272		
No	51(55)	42(45)	93		
Mode of transport to school				114	0.02*
walk	20(9)	210(91)	230		
Cycle	12(25)	35(75)	47		
Others	60(68)	28(32)	88		
Watching television while eating				63	0.001**
Yes	85(41)	122(59)	207		
No	07(5)	151(95)	158		
Total	92(25)	273(75)	365		

Column percentage. For all other variable row percentage is used

* Significant at $p < 0.05$ **significant at $p < 0.01$

It is seen from the (Table1) that as the frequency of fast food consumption decrease the percentage of obesity/overweight also decreases. Not playing outdoor games, going by other means (bus, auto) to school and watching television while eating were significantly associated with development of obesity. Majority of the students correctly perceive their body image. Those who perceive themselves as too thin are in fact really underweight. Those who are obese correctly perceive themselves as fat ($p < 0.001$). None involved in faulty weight reduction practices.

DISCUSSION

Prevalence of overweight and obesity among the middle school children in this study was 13% and 12% respectively. Overall 25% of study participants were above the recommended BMI for their age group which was more or less similar to the findings of Jagadesan et.al ,where it ranges from 15- 18%.(3). Prevalence is similar in primary(12%) and middle school children(12%) as expressed by a study done by Anita.et.al.⁽⁵⁾ Prevalence of obesity among school children was 12% in a study conducted by Theresa et.al at united states(6). So the prevalence of obesity is almost similar both in US and our country. It may be due to urbanisation and industrialisation our children tend to adopt western diet pattern.

Factors associated with development of obesity were found to be fast food consumption, eating while watching television, physical inactivity. In this study majority i.e three fourth participants consume fast foods. Among them 37% consume fast foods very often. Overall 30% were found to be obese among those who consume fast foods, whereas only 12 % were found to be obese in those who do not consume fast foods and this difference was found to be statistically significant. Similar finding was observed in a study among high school boys in Mangalore conducted by Nitinjoseph.et.al(7).In a study done by Irene, they also found frequency of fast food consumption among children is increasing and its consumption is associated with increased BMI⁽⁸⁾

In this study consumption of sweetened soft drinks is not significantly

associated with obesity. Always there exist controversies in this aspect. Some studies found a significant association between soft drink consumption and obesity⁽⁹⁾. Some studies showed no association. Possible explanation for this may be the soft drinks which are available now called diet soft drinks do not contain any calories, so this may be the reason for this finding. In general, the relationship between soft drink consumption and obesity in children is not well understood, and more research is required Eating while watching television is becoming more prevalent now-a-days among children as well as in adults. There was a significant association between obesity and watching television while eating. This finding was supported by many studies(4,10) The fact is that the person tends to eat more than the normal level while watching television without concentrating on eating, since their main focus is on television. This may be the reason for the development of obesity among these people.

It is well known fact that physical inactivity leads to development of obesity. In this study also there was a significant association between physical inactivity and obesity and was supported by many studies(11). Those who walk to school or using cycle are less obese when compared to those who go by bus or auto. Only 15% of those who play outdoor games were obese when compared to those who do not play outdoor games which is 54%.

In this study majority of the students were found to have correct perception of their body image. Those who are obese correctly perceive themselves as fat and adopted appropriate weight reduction measures. Those who were underweight correctly perceive themselves as thin and they were involved in weight gaining practices. But in one study conducted among adolescent there was a false perception of body images and they were involved in unhealthy weight reduction practices⁽¹²⁾ Since this study involves children of age 11-14 years, they may not have that much interest towards body image as media influence on this age group tend to be less when compared to adolescent who concentrate much on body image.

The major limitation of this study is that it was conducted in a small rural area and involving only Government school children, the findings may not be generalised to all school children in Tamil Nadu. Further it is suggested to do a large multicentre study to find the exact magnitude of the problem.

CONCLUSION

There is an increasing trend of overweight and obesity among school children, hence it is high time to take necessary action at school, community and home by coordinated effort of the teachers and parents by means of encouraging regular physical activity and healthy dietary habits. This is the ideal age to inculcate healthy life styles, to prevent the occurrence of disease in future.

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REFERENCES

- WHO (2019) <https://www.who.int/news-room/fact-sheet/detail/obesity-and-overweight>
- Mohan, V., Ranjani, H., Mehreen, T., Pradeepa, R., Anjana, R., Garg, R., & Anand, K. (2016). Epidemiology of childhood overweight & obesity in India: A systematic review. *Indian Journal Of Medical Research*, 143(2), 160
- Jagadesan, S., Harish, R., Miranda, P., Unnikrishnan, R., Anjana, R., & Mohan, V. (2014). Prevalence of overweight and obesity among school children and adolescents in Chennai. *Indian Pediatrics*, 51(7), 544-549.
- Kuzbicka, K., Rachon, D. (2013). Bad eating habits as the main cause of obesity among children. *Paediatric Endocrinology Diabetes Metab*, 19(3), 106-10.
- Pienaar, A. (2015). Prevalence of overweight and obesity among primary school children in a developing country: NW-CHILD longitudinal data of 6-9-yr-old children in South Africa. *BMC Obesity*, 2(1).
- Cuevas-Nasu, L., Hernández-Prado, B., Shamah-Levy, T., Monterrubio, E., Morales-Ruan, M., & Moreno-Macias, L. (2009). Overweight and obesity in school children aged 5 to 11 years participating in food assistance programs in Mexico. *Salud Pública De México*, 51, S630-S637.
- Joseph, N. (2015). Fast Food Consumption Pattern and Its Association with Overweight Among High School Boys in Mangalore City of Southern India. *Journal of clinical and diagnostic research*.
- Braithwaite, I., Stewart, A., Hancox, R., Beasley, R., Murphy, R., & Mitchell, E. (2014). Fast-food consumption and body mass index in children and adolescents: an international cross-sectional study. *BMJ Open*, 4(12), e005813.
- Katzmarzyk, P., Broyles, S., Champagne, C., Chaput, J., Fogelholm, M., & Hu, G. et al. (2016). Relationship between Soft Drink Consumption and Obesity in 9-11 Years Old

- Children in a Multi-National Study. *Nutrients*, 8(12), 770.
10. Rosiek, A., Maciejewska, N., Leksowski, K., Rosiek-Kryszewska, A., & Leksowski, L. (2015). Effect of Television on Obesity and Excess of Weight and Consequences of Health. *International Journal Of Environmental Research And Public Health*, 12(8), 9408-9426.
 11. Kumar, S., Kotian, S., & Kotian, M. (2010). Prevalence and determinants of overweight and obesity among adolescent school children of South Karnataka, India. *Indian Journal Of Community Medicine*, 35(1), 176.
 12. Park, S., & Lee, Y. (2017). Associations of body weight perception and weight control behaviours with problematic internet use among Korean adolescents. *Psychiatry Research*, 251, 275-280.