

Obesity among Adolescents of Urban and Rural Schools in Mangalore

Niby Hormis ¹, Fatima D'silva²

Abstract:

With a view to identify the occurrence of obesity and its related factors among adolescents of selected urban and rural schools. 1200 adolescents from selected high schools in Mangalore were recruited through multistage random sampling. A demographic Performa and a 5 point rating scale were used to assess the lifestyle practices. A significant difference in the occurrence of obesity was found among urban and rural children respectively i.e. 31 (5.2%) and 13 (2.2%), Z cal value 2.640 > Z tab value 1.96). Occurrence of obesity was 50.43 times more among adolescents with poor / satisfactory lifestyle practices than with good / very good lifestyle practices. A significant association was found between obesity and variables like type of family (X^2 cal=3.994, $p<0.05$), family history of obesity (X^2 cal =6.168, $p<0.05$), and family income (X^2 cal =4.123, $p<0.05$) in rural adolescents and between obesity and family history of obesity (X^2 cal =8.492, $p<0.05$) and family income ($p=0.042$, $p<0.05$) in urban adolescents. Adolescent obesity is an emerging health problem and there is need for creating awareness among parents, teachers as well as children regarding safe dietary habits and active life style.

Adolescent obesity also known as 'New World Syndrome' is a global health challenge of the 21st century, with morbid obesity affecting 5 percent of the country's population. Obesity in teenagers is a growing problem that has become worse in recent times. America is a top leader in obesity in teenagers. It is believed that more than 25 percent of schoolchildren are overweight and in fact, obese, and nearly a fourth of them are at risk of getting heart disease, diabetes, stroke and possibly, early death.

Similar trends are being observed even in the developing world, though less rapidly. School surveys have shown that 30 percent of adolescents in our cities are already overweight. A study done by the Nutrition Foundation of India among 5,000 children between 4-18 years old in a private school in Delhi revealed that 29 percent were overweight and 6 percent were obese. A recent study conducted among the affluent public school children in New Delhi, revealed prevalence of overweight and obesity of about 25 percent and 7 percent, respectively (Kapil et al, 2002). Similarly, Subramanyam et al (2003) have re-

ported that prevalence of overweight and obesity among the affluent adolescent school children in Chennai, was about 15 percent. As a rapidly developing country, India has a poor prognosis for its growing obesity problem. The prevalence of obesity among adolescents aged 12 to 19 has more than tripled, increasing from 5 percent in 1980 to 17.6 percent in 2006.

The most significant long-term consequences of adolescent overweight and obesity are their persistence into adulthood with health risks, such as dyslipidemia, hyperinsulinemia, type 2 diabetes, hypertension, cardiovascular diseases, arthritis, and behavioural problems. In view of the magnitude of the problem, it was proposed to carry out a study on the occurrence of obesity and its related factors among adolescents of selected rural and urban schools in Mangalore (Karnataka) so, that the findings would help in formulation of strategies to prevent and control the problem among the target groups.

Review of literature

A cross sectional study conducted on prevalence of obesity and its influencing factor among 1,496 affluent school children aged 10-15 years at Davangere city revealed 5.74 percent of children were obese, obesity was higher among girls (8.82%) than boys (4.42%). Family

The authors are : 1. MSc Nursing student, Nitte Usha Institute of Nursing Sciences, Nitte University, Deralakatte, Mangalore (Karnataka); 2. Principal & HOD, Department of Medical Surgical Nursing, Nitte University, Deralakatte, Mangalore (Karnataka).

history, snacking habits, lack of physical activity were some of the significant contributors to obesity.

A cross sectional study conducted in four randomly selected public schools at Delhi in 2002 to assess prevalence and type of obesity also revealed prevalence of obesity at 5.3 percent and overweight at 15.2 percent.

In a study conducted at Ludhiana among 2008 school children aged 9-15 years to determine prevalence of obesity and it was found to be 11.1 percent, and it was higher among boys than girls (12.9% vs 9.9%). Significantly more children from higher socio-economic status were found to be obese.

Materials and Methods

Study design: A comparative descriptive survey approach was adopted for the study.

Study setting: The present study was conducted in selected urban and rural high schools in Mangalore.

Sampling technique: The sample comprised of 1,200 adolescents, 600 each from urban and rural high schools in Mangalore. Multistage random sampling technique was used to obtain the samples.

Data collection process

Ethical permission was obtained from the institutional ethical review board (IRB). Four schools each from the urban and rural area were randomly selected for the study. After reaching the concerned school, permission was obtained from the Principal. The classes were selected randomly from each grade. The second stage consisted of selecting school children between the age group of 13-16 years using school record till the desired sample from each class was met. It was assumed that from each institution, at least 50 subjects would be recruited from each class. An informed consent was taken from all the subjects individually after explaining the objectives and purpose of the study. Subjects were demonstrated the position required during the measurement of height and weight. Height of each subject in standing position was taken. Bare foot weight was taken for all the subjects with the same calibrated weighing machine. Body mass index (BMI) of the subjects were calculated, and were classified based on National Centre for Health Statistics, USA, (NCHS) and Centre for Disease Control, USA, CDC (2000) standards, as

obese, overweight, normal, under weight. The demographic proforma and rating scale on lifestyle practices were administered to the subjects.

Instruments used:

1. Socio-demographic proforma
2. 5-point Likert scale to assess lifestyle practices
3. Weighing scale and height scale

The 5-point rating scale consisted of 45 items pertaining to dietary practices (20 items), physical activity (11 items), sleep pattern (8 items), and pattern of watching television (6 items). The reliability coefficient of rating scale was found to be 0.89, which shows that the tool is highly reliable.

Data analysis

Statistical package of social sciences was used for statistical analysis of raw data. Descriptive statistics was used to describe the sample characteristics. 'Z' and Odd's ratio test were computed to determine the significant difference between occurrence of obesity among urban and rural adolescents. Association between obesity, lifestyle practices and selected demographic variables was analyzed using chi-square ($p < 0.05$)

Results

Sample characteristics

Among 1200 subjects, majority of the adolescents of urban schools ($n=208$, 34.7%) and rural schools ($n=200$, 33.3%) belonged to 14 yrs of age. 309 (51.5%) adolescents of urban schools and 291 (48.5%) adolescents of rural schools were males. Majority of the urban children ($n=528$, 88%) and rural children ($n=388$, 64.7%) belonged to nuclear family. With regard to family history of obesity among adolescents, 17 (2.8%) of urban and 12 (2%) adolescents of rural schools had family history of obesity. Distribution of samples according to occupation of the father showed that, among adolescents of urban schools, majority ($n=514$, 85.7%) were professionals, and among rural schools, majority ($n=512$, 85.3%) were daily wage earners. Highest percentage of adolescents of urban schools i.e. 543 (90.5%) were from families with income above Rs.15,001, and 368 (61.3%) of rural schools were from families with income between Rs 5,001-10,000.

Occurrence and comparison of obesity among adolescents of selected urban and rural schools

Table 1: Distribution of samples according to occurrence of obesity (n=600+600)

Variable	Urban (f)	Rural (f)	Z _{cal} value
Obese & Overweight	31	13	2.640
Non-obese	569	587	

Z tab value=1.96

Occurrence of obesity among urban adolescents was 31 (5.2%) which was significantly higher than the rural adolescents 13 (2.2%). (Z_{cal} = 2.640 > Z_{tab} = 1.96) (Table 1).

Odds of occurrence of obesity with regard to lifestyle practices among adolescents of selected urban and rural schools

Odds of occurrence of obesity was 48.20 times more in adolescents with poor / satisfactory dietary practices than those with good / very good dietary practices, 76.77 times more in adolescents with poor /satisfactory physical activity than those with good / very good physical activity, 0.459 times more in adolescents with poor / satisfactory sleep pattern than those with good / very good sleep pattern, and 3.14 times more in adolescents with poor / satisfactory pattern of watching television than those with good / very

Table 2: Odds of occurrence of obesity with regard to lifestyle practices (n=600+600)

Variables	Obese & Overweight	Non-obese	Odds ratio
<i>Dietary practices</i>			
Median score			
≥ 53 (good / v. good)	1	611	48.20
<53 (poor / satisfactory)	43	545	
<i>Physical activity</i>			
Median score			
≥ 24 (good / v. good)	1	741	76.77
< 24 (poor / satisfactory)	43	415	
<i>Sleep pattern</i>			
Median score			
≥ 22 (good / v. good)	39	904	0.459
< 22 (poor / satisfactory)	5	252	
<i>Pattern of watching TV</i>			
Median score			
≥ 17 (good / v. good)	12	626	3.14
< 17 (poor / satisfactory)	32	530	
<i>Overall lifestyle practice score</i>			
Median score			
≥ 117 (good / v. good)	1	624	50.43
< 117 (poor / satisfactory)	43	532	

good pattern of watching television. The overall odds of occurrence of obesity was 50.43 times more in adolescents with poor / satisfactory lifestyle practices than those with good / very good lifestyle practices (Table 2).

Association between obesity and lifestyle practices

Among adolescents of urban schools there was significant association between obesity and lifestyle practices such as dietary practices (X² cal = 37.59, p<0.05), physical activity (p=0, p<0.05) , sleep pattern (p=0.001, p<0.05) and pattern of watching television (X² cal = 46.673, p<0.05) at 0.05 level of significance.

Among adolescents of rural schools significant association was found between obesity and lifestyle practices like dietary practices (X² cal = 45.642, p<0.05) and sleep pattern (p-value=0.022, p<0.05), whereas no association was found between obesity and lifestyle practices like physical activity (p=0.381, p>0.05) and pattern of watching television (p= 0.784, p>0.05) at 0.05 level of significance.

Association between obesity and demographic variables among adolescents of selected urban and rural schools

Among rural adolescents there was significant association between obesity and demographic variables like type of family (X² cal=3.994, p<0.05), family history of obesity (X² cal=6.168, p<0.05), and family income (X² cal=4.123, p<0.05) at 0.05 level of significance.

Among adolescents of urban schools there was significant association between obesity and demographic variables like family history of obesity (X² cal=8.492, p<0.05) and family income (p=0.042, p<0.05) at 0.05 level of significance.

Discussion

The present study has identified the occurrence of obesity more among urban adolescents

31 (5.2%) than of rural children 13 (2.2%). Obesity a prevalent and significant problem has also been reported by various studies conducted in rural area of Wardha district, in which prevalence of overweight/obesity was found to be 2.2. A similar study in Hyderabad showed the prevalence of overweight as 7.2 percent among the 12 to 17 year age group. A study in Delhi on affluent school children showed the prevalence of obesity to be 7.4 percent.

The results of the study and various reviews have exposed the fact that the percentage of overweight and obese children are growing in both rural and urban areas of Karnataka like in other states of India and other parts of the world.

The present study has revealed various factors that have been strongly linked with obesity like poor dietary practices (OR=48.50), physical inactivity (OR=76.77), poor sleep pattern (OR=0.459) and pattern of watching television (OR=3.14). The overall odd of occurrence of obesity was 50.43 times more in adolescents with poor / satisfactory lifestyle practices than those with good / very good lifestyle practices. Different studies conducted among adolescents in India and worldwide have revealed skipping breakfast (OR =1.15), watching television and playing computer games for more than 4 hrs/day (OR=7.3), physical activity for <2 hrs/day (OR=21) and daily intake of chocolates (OR=5.6) as some of the factors leading to overweight or obesity.

A significant association was found between occurrence of obesity and family income in both rural and urban children respectively, ($p=0.042$, $p<0.05$; $X^2_{cal}=4.123$, $p<0.05$). The above findings were consistent with a cross sectional study conducted in Karachi, which showed 71 percent of obese children, belonged to the higher socio-economic status group. Another study conducted on factors affecting prevalence of overweight among urban adolescents in Hyderabad revealed that the risk of overweight was 4 times higher among the adolescents of high SES.

The study also revealed a significant association between occurrence of obesity and family history in both rural and urban children respectively, ($X^2_{cal}=8.492$, $p<0.05$; $X^2_{cal} = 6.168$, $p<0.05$). Similar studies conducted at Taiwan and Syria have reported that the likelihood of obesity was significantly greater amongst subjects reporting family history of obesity.

Conclusion

Low levels of physical activity, long hours of watching television, and consuming junk foods are associated with a higher prevalence of overweight. Nurses are the credible sources of health information and play a vital role in creating health consciousness among the public. Hence they can educate the community, the parents, teachers and the adolescents on the aspects of healthy food habits and desired lifestyles to prevent overweight/obesity and its associated ill effects.

References

1. Patralekha Chatterjee. India sees a parallel rise in malnutrition and obesity 2002. Dec 14; 360. Available from: <http://www.ncbi.nlm.nih.gov/pubmed.> (10/8/2010)
2. Kapil U, Singh P, Pathak P, Dwivedi SN, Bhasin S. Prevalence of obesity amongst affluent adolescent school children in Delhi. *Indian Pediatr* 2002; 39: 449-52
3. Subramanyam V, Jayashree R, Mohamad R. Prevalence of overweight and obesity in affluent adolescent girls in Chennai in 1981 and 1998. *Indian Pediatrics* 2003; 40: 332-36
4. Kumar S, Mahabalraju DK, Anuroopa MS. Prevalence of obesity and its influencing factor among affluent school children of Davangere city. *Indian Journal of Community Medicine* 2007; 32(1): 15-17
5. Mehta M, Bhasin SK, Agarwal K, Dwivedi S. Obesity amongst affluent adolescent girls. *Indian J Pediatr* 2007; 74: 619-22
6. Chhatwal J, Verma M, Riar SK. Obesity among pre-adolescent and adolescents of a developing country(India). *Asia Pac J Clin Nutr.*2004; 13(3): 231-35
7. Deshmukh PR, Gupta SS, Bharambe MS, Dongre AR, Maliye C, Kaur S, et al. Nutritional status of adolescents in rural Wardha. *Indian J Pediatr* 2006; 73 : 15-17
8. Avula Laxmaiah, Balakrishna Nagalla, Kamasamudram Vijayaraghavan, & Mohanan Nair. Factors affecting prevalence of overweight among 12- to 17-year-old urban adolescents in Hyderabad, India. *Obesity* 2007; 15: 1384-90
9. Thompson-McCormick JJ, Thomas JJ, Bainivualiku A, Khan AN, Becker AE. Breakfast skipping as a risk correlate of overweight and obesity in school-going ethnic Fijian adolescent girls. *Asia Pac J Clin Nutr* 2010; 19(3): 372-82
10. Liou YM, Liou TH, Chang LC. Obesity among adolescents. *Journal of Advanced Nursing* 2010; Jun 66(6), 1246-56
11. Shashidhar Kotian M, Ganesh Kumar S, Kotian Suphala S. Prevalence and determinants of overweight and obesity among adolescent school children of South Karnataka. *Indian Journal of Community Medicine* 2010; 35(3): 176-78
12. Haider Javed Warraich, Faisal Javed, Mohammed Farazul-Haq, Fariha Batool Khawaja, Sarah Saleem. Prevalence of obesity in school-going children of Karachi. *Plos One* 2009. 4(3)
13. Nasreddine L, Mehio-Sibai A, Mrayati M, Adra N, Hwalla N. Adolescent obesity in Syria. *Child Care Health Dev* 2010; May, 36(3): 404-13