Original Research Article

A study of prevalence of obesity among adolescents (10-19 years) in Jaipur city with special reference to lifestyle

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ABSTRACT

Background: Childhood obesity is not an immediate lethal disease itself, but has a significant risk factors associated with a range of non-communicable diseases in adulthood. The aim of this study to determine the nutritional status of adolescents and to determine the proportion of adolescents having overweight and obesity.

Methods: We included 1000 students aged between 10-19 years divided equally between government schools and private schools. This study was a questionnaire based study, only those adolescent children were included who volunteered. All the respondents were introduced to the topic of study and the need to collect sensitive information and were promised confidentiality of the entries.

Results: The average age of the study group was 15.20±2.60 years in government schools and 15.28±2.53 years in private schools. The difference was statistically not significant (p=0.095). Among obese adolescents' waist hip ratio is 0.013 Significant, neck circumference is 0.018 Significant, BMI is <0.001 Significant.

Conclusions: Therefore, strategies for prevention of overweight, obesity, weight reduction, promotion of healthy lifestyles and regular monitoring are necessary to prevent the onset and early detection of adolescents health problems. This study has brought out important points for further study for sufficiently larger samples to confirm the epidemiological consistency of the observations made in this study.

Keywords: Adolescents, Life style, Obesity, Socioeconomic status

INTRODUCTION

Childhood obesity affects both developed and developing countries of all socio-economic groups, irrespective of age, sex or ethinicity. It has been estimated that worldwide over 22 million children under the age of 5 are obese, and one in 10 children is overweight. World Global Report Geneva: World Health Organisation; 2005. World Health Organisation.[1] Obesity is increasingly prevalent nutritional disorders not only in adults but also among children and adolescents.[2]

Numerous health risk factors have been associated with adolescent overweight and obesity including hypertension, cardiovascular diseases, respiratory diseases, diabetes, dyslipidemia, arthritis, etc.[3]

Diet and lifestyle are major contributors to obesity and varies with different socioeconomic status especially in country like India. During the transition from childhood to adulthood, adolescents establish patterns of behaviour and make lifestyle choices that affects their both current and future health.[4]

Adolescence is a fascinating period of life that marks the transition from being a dependent child to becoming an independently functioning adult. The changes that occur in adolescent are[5]

- Biological development (body size and shape)
- Cognitive development
- Self-concept and self esteem
- Sexuality and mortality
- Relationship with family, peers and society

Thus, adolescence is marked as a period of growth spurt and maturation, the extent of physical growth is not determined by genetic, hereditary factors alone but also on availability of adequate nutrition, micronutrients in the diet and access to health services.

In recent years, the incidence of adolescent pregnancy and childbirth is increasing due to the early onset of puberty, the declining age of menarche and early sexual activity in developed and in many developing countries. Educational levels strongly influence adolescent child bearing.

Adolescents poor information about reproduction, sexual activity and access to contraceptive services contribute to adolescent pregnancy. The present study was proposed to be undertaken to address the problems of overweight, obesity and lifestyle of today's adolescents.

METHODS

The study was conducted in the Department of Pediatrics, Mahatma Gandhi Medical College and Hospital of Mahatma Gandhi Medical Sciences and Technology, Sitapura, Jaipur from January to June 2014.

Permission from the ethical committee of Mahatma Gandhi University of Medical Sciences and Technology, RIICO Industrial Area, Sitapura, Jaipur was obtained before starting the present study. For the present study, we included 1000 students aged between 10-19 years divided equally between government schools and private schools. This study was a questionnaire based study, only those adolescent children were included who volunteered. Schools were recruited after prior consent of the respective principals allowing conducting the present

study. All the respondents were introduced to the topic of study and the need to collect sensitive information and were promised confidentiality of the entries.

The study was conducted in private schools which are likely to have children of upper socioeconomic class children and government schools which were likely to have children of lower socioeconomic class children. Socioeconomic status of parents was classified as per Kuppuswamy classification.[6]

Questionnaire was aimed to assess the life style, physical activity and social factors that influence physical and social health of adolescents including socioeconomic status participations for physical activity diet having junk food, chocolate, eating habit, frequency of visiting restaurant per week and lifestyle.

Inclusion criteria

- Boys and girls in the age group of 10 – 19 years studying in public and government schools of Jaipur.
- Consent of school authorities/parents.

Exclusion criteria

- Children less than 10 years of age or over 19 years.
- Children consuming drugs that can cause weight gain/loss.

Statistical Analysis

Descriptive and inferential statistical analysis been carried out in the present study. Results on categorical measurements are presented in Number (%). Significance is assessed at 5% confidence limits into (No significance, significant and strongly significant) different levels of significance. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups

RESULTS

The average age of the study group was 15.20 ± 2.60 years in government schools and 15.28 ± 2.53 years in private schools. The difference were statistically not significant (p=0.095) (Table 1).

Table 1: Age-wise distribution of respondents.

Age yrs		Government school		Private school		Total	
Age		No	%	No	%	No	%
1	Early	130	26	147	29.4	277	27.7
2	Mid	135	27	152	30.4	287	28.7
3	Late	235	47	201	40.2	436	43.6
Total		500	100	500	100	1000	100

Socioeconomic status of families of adolescents of government schools belonging maximum in lower middle is 208 (41.6%) and minimum in lower is 27 (5.4%) while socioeconomic status of adolescents of private schools belonging to upper class is 32 (6.4%), upper middle is

121 (24.2%), lower middle is 291 (58.2%) (Table 2). Among obese adolescents' waist hip ratio is 0.013 Significant, neck circumference is 0.018 Significant, BMI is <0.001 Significant (Table 3).

Table 2: Distribution of the cases according to socioeconomic status (Kuppusawamy).

Socioeconomic status	Government school		Private school		Total		p-value
	No	%	No	%	No	%	
Upper	22	4.4	32	6.4	54	5.4	
Upper middle	68	13.6	121	24.2	189	18.9	
Lower middle	208	41.6	291	58.2	499	49.9	P=0.000
Upper lower	175	35	56	11.2	231	23.1	
Lower	27	5.4	0	0	27	2.7	
	500	100	500	100	1000	100	

Table 3: Association of obesity with obesity indicators.

Obesity		Waist hip ratio	Neck circumference	BMI
Non-obese	N	980	980	980
	Mean	0.81	35.14	25.44
	Std. deviation	0.04	2.36	3.28
Obese	N	20	20	20
	Mean	0.84	36.42	32.74
	Std. deviation	0.04	2.82	0.67
p		0.013 Significant	0.018 Significant	<0.001 Significant

In this study, up to 55% /11 obese adolescents had 75 to 100% excess calorie consumption, 25% /5 adolescents had 50 to 74%, 20% /4 had 25 to 49% of excess calorie consumption (Table 4).

Table 4: Relationship of overweight and obese adolescents to excess calories consumed.

Excess calories	No.	%
Upto 25%	0	0.0
25 to 49%	4	20
50 to 74%	5	25
75 to 100%	11	55
Total	20	100

DISCUSSION

In the present study, equal number of respondents were included from private and government schools on voluntary basis. As is clear from questionnaire identity of respondent was not required and not recorded. There were 500 adolescents each from government school out of which 130 were from early (10-13years), 135 from middle (14-16years) and 235 from late (17-19 years) adolescent group. There were 500 adolescents from private school of which 147 were from early, 152 from

middle and 201 from late adolescents. However, the differences were statistically not significant (p=0.095). Childhood obesity is a global phenomenon affecting all socio-economic groups, irrespective of age, sex or ethnicity. Etiopathogenesis of childhood obesity is multi-factorial and includes genetic, neuroendocrine, metabolic, psychological, environmental and socio-cultural factors. Many co-morbid conditions like metabolic, cardiovascular, psychological, orthopedic, neurological, hepatic, pulmonary and renal disorders are seen in association with childhood obesity.[1]

A holistic approach to tackle the childhood obesity epidemic needs a collective activity including influencing policy makers and legislation, mobilizing communities, restructuring organizational practices, establishing coalitions and networks, empowering providers, imparting community education as well as enriching and reinforcing individual awareness and skills. The implications of this global phenomenon on future generations will be serious unless appropriate action is taken.

Socioeconomic status of parents was classified as per Kuppuswamy classification.[6] In the present study socioeconomic status of families of adolescents of

government schools belonging to upper class is 22 (4.4%), upper middle class is 68 (13.6%), lower middle is 208 (41.6%), upper lower is 175 (35%) and lower is 27 (5.4%) while socioeconomic status of adolescents of private schools belonging to upper class is 32 (6.4%), upper middle is 121 (24.2%), lower middle is 291 (58.2%), upper lower 56 (11.2%), and lower has 0 (0%).

In a study in Jaipur by Shekhawat et al, out of 500 studied population 230 were from upper and upper middle (class I and class II SES) from private school in contrast to all cases from government school from class II, III and IV. No case was observed from class IV and V from private school and class I and class IV from government school. However, significant difference was observed in these two groups in class II and III (p value= <0.001 and <0.05 respectively).[7]

In another study by Sharma et al socioeconomic status of parents of 250 adolescents of private schools was 41.6% to upper class, 50.4% to upper middle, 8% to lower middle and none to upper lower and lower while socioeconomic status of parents of 250 adolescents of government schools was 0% to upper, 20.4% to upper middle,18% to lower middle, 61.6% to upper lower and none to lower.[8]

Another study conducted in New Delhi reported the prevalence of overweight and obesity in school children from low and upper socioeconomic status (Lower socio-economic status and upper socio-economic status respectively). The study included 21485 students in the age group of 5-18. Of the 21485 subjects, 8840 belonged to lower socio-economic status and 12645 belonged to upper socio-economic status group.[9]

So, in present study socioeconomic status of families of adolescents of government schools belonging to upper class is 4.4% as compared to 6.6% of private schools and adolescents belonging to lower class is 5.6% from government school and 0% from private school.

In this study among obese adolescents' waist hip ratio is p=0.013 (significant), neck circumference p=0.018 (significant), BMI p= <0.001 (highly significant). Various studies from India show the increased prevalence of obesity. Data from NFHS II (1998-1999) showed the prevalence of obesity as 0.1percent in the age group of 15 to 19 years.[10]

A study conducted in one public school of Delhi catering to the affluent segment of population found the overall prevalence of obesity to 7.4%. This study included 870 children in the age of 10-19 years, out of which 64.5 percent were boys and rest were girls. The study used international cut off point for BMI for classifying children as obese. The study found that 8 percent of the boys and 6 percent of girls were obese.[11] A study conducted in South India in Ernakulam District, Kerala determined the time trends of obesity and overweight in a large population of school children. Obesity and overweight was found in 4.94% of total students in 2003 and which increased to 6.57% in 2005.[12] Among obese mean waist hip ratio was 0.84 (p=0.013 significant), neck circumference was 36.4(p=0.018 significant), BMI was 32.74 (p= <0.001highly significant) while in non-obese waist hip ratio was 0.81, neck circumference was 35.14, BMI was 25.4.

CONCLUSION

This present study concluded that Among 20 obese adolescents waist hip ratio (WHR), neck circumference and BMI were significant. Eleven obese adolescents had 75 to 100% excess calorie consumption, 5 adolescents had 50 to 74%, 4 had 25 to 49% of excess calorie consumption (significant). Therefore, strategies for prevention of overweight, obesity, weight reduction, promotion of healthy lifestyles and regular monitoring are necessary to prevent the onset and early detection of adolescents health problems. This study perhaps, is the sole attempt to look into adolescents health problems in Jaipur City, Rajasthan. This study has brought out important points for further study for sufficiently larger samples to confirm the epidemiological consistency of the observations made in this study.

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