

Original Research Article

Prevalence of obesity among adolescents: a facility-based study

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ABSTRACT

Background: Obesity and overweight are described as abnormal or excessive fat accumulation that poses a health risk. Obesity has become a global health issue, with obesity being generally recognized as a major risk factor for coronary heart disease, hypertension, diabetes, and a variety of other illnesses. Childhood obesity is one of the major health challenges in every country across the world. The goal of this study was to determine the prevalence of obesity among teenagers and its relationship to sociodemographic parameters.

Methods: The estimated sample size is n=204 we included n=215 cases coming to OPD at primary health center Vantamuri. Following the completion of the questionnaire, height and weight parameters were measured and recorded. Weight (kg) was measured using a weighing scale with a 0.1 kg error margin without shoes or heavy clothes; the weighing scale was calibrated regularly using established reference weights.

Results: Out of the total n=215 cases included in the study n=98 (45.5%) were males and n=117 (54.4%) were females. In most of the cases in the study n=151 (70.2%) were performing physical activity only sometimes and n=26 (12%) did not perform any physical activity. Only 17.6% of cases performed some form of physical activity frequently. In this study, we found that 34.8% of cases were in the overweight category and 26.9% in the obese category. The incidence of fast-food consumption was every day and frequently found in 29% and 33% respectively.

Conclusions: Obesity and overweight are preventable by establishing school-based awareness programs and educating parents about healthy lifestyle management, so indirectly avoiding chronic illness in adulthood. Children should be encouraged to participate more frequently in physical activities.

Keywords: Adolescent, Overweight, Obesity, Prevalence

INTRODUCTION

Obesity is the disorder of abnormal or excessive body fat accumulation that presents a health risk. The prevalence of obesity is presently being observed in both developed and developing nations. The global epidemic of obesity reflects massive social, economic, and cultural problems. Obesity has become far more common among children, adolescents, and adults throughout the world in recent decades.¹ Overall, the frequency of obese teenagers in the world has increased dramatically from 4% in 1975 to a little over 18% in 2016.² Approximately 35 million overweight children are living in developing countries and 8 million in developed countries. Studies have shown obesity and overweight are risk factors for a variety of

chronic illnesses, including type 2 diabetes, cardiovascular disease, respiratory disease, musculoskeletal problems and cancer.³ According to research, prevalence of overweight among teenagers ranges between 10% and 30%.⁴⁻⁷ Because of variances in lifestyle, particularly in food choices and physical exercise, prevalence varies across country. In addition, the primary causes of the rise in incidence of childhood obesity include urbanization and industrialization. Rong et al found the link between teenage obesity and non-alcoholic fatty liver disease (NAFLD) and discovered that the incidence of NAFLD rose as body weight increased.⁸ Lisan et al examined patients with obesity and severe obstructive sleep apnoea (OSA) who were administered positive airway pressure (PAP) treatment to those who

were not and found that those who were prescribed PAP had a higher BMI than those who were not.⁹ All countries have framed a set of global targets for halting the increase in overweight/obesity, its main target is to that no increase in overweight among children under age 5, school-age children, or adolescents by 2025. According to various research, the incidence of pediatric obesity in India currently ranges from 4% to 22%.^{10,11} Some researchers have pointed to features along with obesity (such as anxiety, sadness, social disengagement, and so on).^{12,13} Less outdoor physical activity, greater television and screen time usage, children residing in urban areas, and high family wealth are all factors that contribute to a rise in the prevalence of overweight and obesity among children in India. This study aimed to determine the prevalence of adolescent obesity in cases visiting rural areas of PHC Vantamuri under the administrative control of JNMC in Belagavi district of Karnataka.

METHODS

A cross-sectional study was conducted from 1st October 2021 to 30th November 2021 among people coming to OPD at primary health center Vantamuri (Rural) under the administrative control of Jawaharlal Nehru medical college in Belagavi district of Karnataka. Ethical clearance was obtained from ethical committee J. N. medical college Belagavi. Participants were interviewed with a pre-validated questionnaire, and the data collected using GSHS (Global school-based student health survey). Informed consent was obtained from the parents-Personal identification, socio-demographic characteristics, diet preference, type of family and number of family members, mode of birth and presence of any gestational co-morbidity in mother, education of mother, frequency of physical activity and mode of transport to school.

Inclusion criteria

All school-going adolescents (12-18 years) visiting OPD of PHC, Vantamuri, males and females, voluntarily willing to participate in study were included in the study.

Exclusion criteria

Adolescents with any endocrine abnormalities, low birth weight, macrosomia at birth and congenital diseases patients were excluded from the study.

Sample size

$$N = \frac{4pq}{d^2}$$

Where n=sample size, p=prevalence taken as p=15, q=85, d=absolute error n=4×15×85/25=204.

The estimated sample size is n=204 we included n=215 cases in study. Following completion of questionnaire, height and weight parameters measured and recorded.

Weight (kg) was measured using a weighing scale with a 0.1 kg error margin without shoes or heavy clothes; weighing scale was calibrated regularly using established reference weights. Participants were told to stand in an erect stance with their feet not wide apart and their eyes facing straight, using a portable anthropometric rod with an inaccuracy of less than 0.1 cm. Overweight, obese, and underweight were identified by using WHO charts of BMI for ages 5-19 years for boys and girls. Children were graded as overweight with a percentile score of ≥ 85-97 and obese if the percentile score is ≥ 97.

Statistical analysis

Data collected and uploaded on MS excel spreadsheet and analyzed by SPSS version 22 (Chicago, IL, USA). Quantitative variables expressed on mean and standard deviations and qualitative variables were expressed in proportions and percentages. Fisher's exact test has been used to find the difference between two proportions.

RESULTS

Out of the total n=215 cases included in the study n=98 (45.5%) were males and n=117 (54.4%) were females. The most common age group was thirteen and fourteen years with n=40 (18.6%) cases each followed by sixteen years with n=39 (18.1%) cases. The detailed age-wise distribution of the cases in study is depicted in Table 1.

Table 1: Age-wise distribution of cases in the study.

Age (years)	Frequency	Percentage (%)
Twelve	21	9.76
Thirteen	40	18.6
Fourteen	40	18.6
Fifteen	27	12.5
Sixteen	29	13.4
Seventeen	39	18.1
Eighteen	19	8.83
Total	215	100

Based on the religion of cases in study n=199 (77.0%) were Hindu, n=10 (4.6%) were Jains, n=38 (17.6%) were Muslims, and n=1 (0.4%) cases were Sikh.

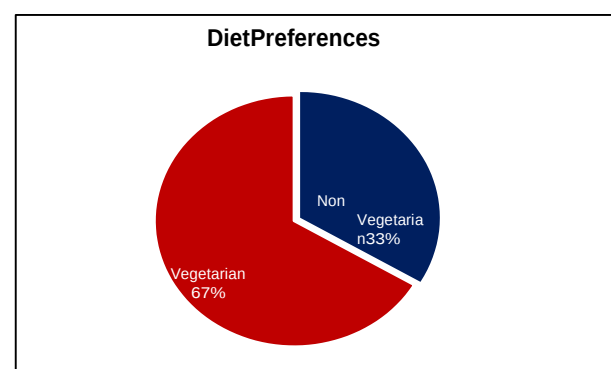


Figure 1: Diet preferences of the cases in study.

The details of family type revealed that n=93 (43.2%) was a 3-gen family, n=102 (47.4%) were a joint family, and n=20 (9.3%) was a nuclear family. The average number of family members revealed most of the cases n=55 (25.5%) is with n=6 family members followed by n=35 (16.2%) were with n=7 family members. N=3 family members were found in n=33 (15.3%) of cases the details have been depicted in Table 2.

Table 2: The total number of family members in the study group.

Total numbers of members	Frequency	Percentage (%)
3	33	15.3
4	32	14.8
5	29	13.4
6	55	25.5
7	35	16.2
8	31	14.4
Total	215	100

Most of the cases in the study were born with vaginal delivery n=180 (83.7%) cases and C-sections in n=35 (16.2%) cases. The incidence of maternal hypertension was in n=12 (5.5%) cases similarly the incidence of diabetes was found in n=9 (4.1%) of cases and the incidence of thyroid disease was in n=5 (2.3%) of cases given in Figure 2.

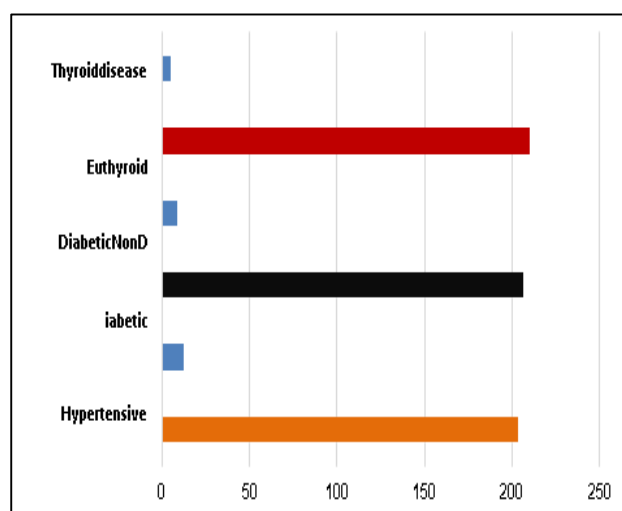


Figure 2: Incidence of the various maternal diseases.

In most of the cases in the study n=151 (70.2%) were performing physical activity only sometimes and n=26 (12.0%) did not perform any physical activity. Only 17.6% of cases performed some form of physical activity frequently given in table 3. Although the mode of transport of n=178 (82.7%) was walking to school/college however most of these were situated at a distance of less than a kilometer from their residence. N=31 (14.4%) used bicycles for transport and n=6 (2.7%) subjects were being taken to school by automobile by parents.

Table 3: Frequency of physical activity in the cases.

Frequency of physical activity	Count of physical activity	Percentage (%)
Frequently	38	17.6
Never	26	12
Sometimes	151	70.2
Total	215	100

Based on the WHO grading children were graded as overweight with a percentile score of ≥ 85 -97 and obese if the percentile score is ≥ 97 . In this study, we found that 34.8% of cases were in the overweight category and 26.9% in the obese category. The overall prevalence of overweight and obesity combinedly was 61.86%. 33.4% of cases were normal weight and only 4.6% were categorized as underweight given in Table 4.

Table 4: WHO BMI classification.

BMI classification (kg/m ²)	WHO percentile score	Frequency	Percentage (%)
Under-weight	<15	10	4.6
Normal weight	≥ 15 - ≤ 85	72	33.4
Over-weight	≥ 85 - ≤ 97	75	34.8
Obesity	≥ 97	58	26.9
Total		215	100

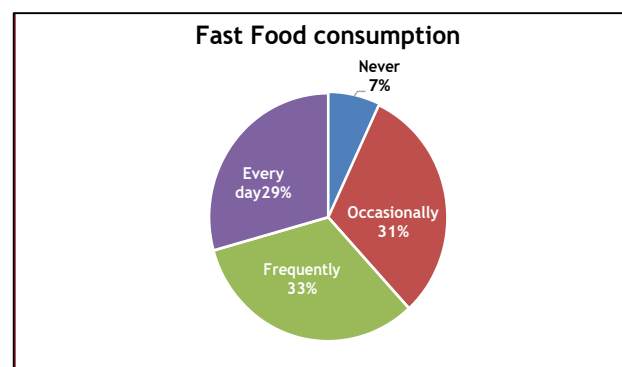


Figure 3: The frequency of fast-food consumption in the cases of study.

The incidence of fast-food consumption was every day and frequently found in 29% and 33% respectively and the mean BMI category of such cases was found to be in the overweight and obese group. Similarly, cases with less fast-food consumption occasionally were found with normal BMI categories depicted in Figure 3. Most of the cases in the study belong to socioeconomic class IV and class V depicted in Figure 4.

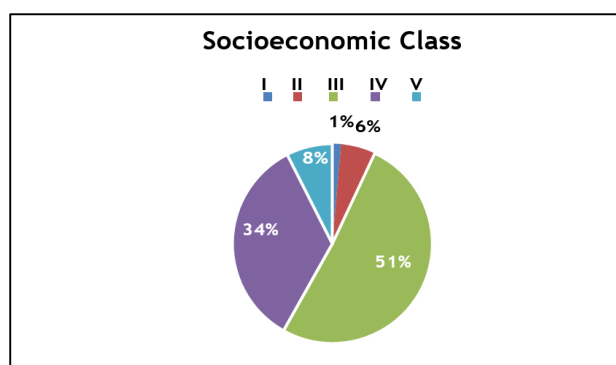


Figure 4: Socioeconomic class of the cases included in the study.

DISCUSSION

The results of the present study conducted on adolescents aged 12 years to 18 years in OPD of PHC Vantamuri under the administrative control of JNMC in Belagavi district of Karnataka found the prevalence of overweight was in 34.8% of cases and 26.9% cases obesity. Prasad et al found the prevalence of overweight in 9.7% cases and obesity at 4.3% cases in Pondicherry.¹⁴ AT Cherian et al in Kerala found the prevalence was 3% for boys, and 5.3% for girls.¹⁵ Prevalence of obesity (7.5%), and overweight (21.9%) were highest among the high-income group and lowest (1.5% and 2.5%) among the low-income group. Kotian et al in South Karnataka, found the prevalence of overweight and obesity to be 9.9% and 4.8% respectively. One of the reasons for the higher trend found in the current study could be because the present study was conducted in the year 2021 and recent data has shown there is an increasing trend for overweight and obesity in the adolescents and school children due to higher intake of fast foods. In this study, we found that 33% of cases take one or more types of fast foods frequently and 29% have confirmed to take fast food every day. Overweight and obesity were found to be significantly higher in these categories of cases. In this study, we found Obesity and overweight were found to be more common in adolescents from nuclear families than in those from joint families in our study, although the differences were not statistically significant. Jain et al in Meerut, Gamit et al in Surat, and Keerthan et al observed similar findings.¹⁶⁻¹⁸ In our research, we discovered that students' socioeconomic position had a significant relationship with their overweight and obese status. Obesity prevalence rises with social class and the relationship was determined to be significant. Similar findings were also discovered by Ganie et al.¹⁹ The present study shows that the prevalence of overweight was more among 15-18 years students at 15% and obesity were more among 12-14 years students respectively. Age was significantly associated with overweight and obesity. Overweight and obesity were more common among boys as compared to girls under the age of 13 years, but the trend changed afterward as found by Kunwar et al.²⁰ According to studies, watching television or using

computers is one of the leading causes of childhood obesity.^{21,22} Regular physical exercise was found to be a key factor in lowering the prevalence of overweight and obesity, which was supported by other similar investigations.^{21,23}

One of the major limitations of the study is it cannot be generalizing as it is carried out in health facility and not in the community or school. Children should be encouraged to participate more frequently in physical activities. Pressing need to implicate different health policies to contest the increasing problem of disparity between calorie intake and calorie requirement leading to obesity as these obese adolescents and making them prone to cardiovascular diseases and endocrine disorders.

CONCLUSION

Obesity and overweight are becoming a big health concern among our school children. In this study, it was shown that the prevalence of overweight/obesity in school students has increased to high levels. Obesity and overweight are preventable by establishing school-based awareness programs and educating parents about healthy lifestyle management, so indirectly avoiding chronic illness in adulthood.

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