

A Study of Factors Related To Overweight and Obesity in Adolescents: A Cross Sectional Study in Urban Areas of Ahmednagar District

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Abstract

Background: The increasing existence of overweight and obesity; especially among adolescents is alarming and it becomes a serious public health challenge. Obesity among adolescents not only causes several complications in adolescence and future transformation of adulthood obesity but it also impairs the economic development of the country. Due to rapid urbanization and life style modification adolescent obesity is also a concern in developing countries like India. So an observational, cross-sectional study was conducted among adolescents in an urban community of Ahmednagar District. *Material and Methods:* Considering the prevalence of overweight and obesity among adolescents in the urban area as 21%, 95% confidence interval and 5% absolute error sample size was calculated as 266. Adding 10% non response, the total number came to 300. Sample was calculated as population proportion to size for each ward. Sample was collected by simple random sampling technique from house list of each ward of the municipality. *Results:* Prevalence of overweight/obesity among the study subjects was 30% and consumption of fast food, sedentary life style, higher socio economic status, consumption of alcohol and residing in a nuclear family were identified as risk factors of adolescent overweight and obesity. *Conclusion:* School based intervention like nutritional education regarding healthy eating and physical activity, increase awareness about the impact of away from home eating on weight management at family level and changes in social environment should be emphasized for the long term success of prevention of obesity.

Keywords: Adolescents; Obesity.

Introduction

Rates of childhood obesity are increasing in both the developed and the developing world. In the United States, 17% of children and adolescents are obese [1]. From 1980–2005, childhood samples from 25 countries and preschool samples from 42 countries revealed that the prevalence of overweight had increased in almost all nations [2]. Increases in overweight and obesity have been especially steep in more developed countries, reflective of the spread of

more sedentary lifestyles and high-fat, energy-dense diets. Developed countries have almost twice the prevalence of preschool obesity when compared to developing countries, yet developing countries have seen a greater change in preschool obesity levels from 1990–2010 [3].

These data indicate a widening of the global problem of obesity. Adolescent obesity is one of the major global health challenges of the 21st century [4]. Obesity among adolescents causes dual problems; firstly obesity is associated with serious medical problems, including high blood pressure, adverse lipoprotein profiles, diabetes mellitus, atherosclerotic cerebrovascular disease, coronary heart disease, colorectal cancer, and death from all – the mentioned causes. Secondly, overweight and obesity acquired during childhood or adolescence may persist into adulthood and increase the risk for some chronic diseases later in life.

The Harvard Growth Study showed that the risk of being overweight in adulthood is twice as high for

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people who were overweight as children than for individuals who were not overweight [5]. Obesity is associated with a number of psychosocial consequences in childhood and adolescence, including poor self-esteem, teasing [6-7]. Overweight adolescents are more likely to be socially isolated and to be peripheral to social networks [8]. Due to rapid urbanization and lifestyle modification prevalence of obesity among children and adolescents is also increasing in the developing world like India. Identification of risk factors, prevention and management of childhood and adolescent overweight is the key for prevention of obesity and its consequences in adult life.

Aim and Objectives

The objectives of the study were to find out the magnitude of overweight and obesity among adolescents in an urban areas of Ahmednagar District, India and to assess the behavioural risk factors for overweight and obesity among the study population.

Material and Methods

A community based cross-sectional study was conducted in the Ahmednagar District in areas situated in close proximity to the hospital from Dec 2015 to Nov 2016 (1 year). From the records (Health on March, Govt. Maharashtra) it was found that proportion of adolescent population (10-19 years) was 21.42 percent [9]. Considering the prevalence of overweight and obesity among adolescents in the urban area as 21% [10]. Considering the prevalence of overweight and obesity among adolescents in the

urban area as 21%, 95% confidence interval and 5% absolute error sample size was calculated as 266. Adding 10% non response, the total number came to 300. Sample was calculated as population proportion to size for each ward. Sample was collected by simple random sampling technique from house list of each ward of the municipality. Households with adolescents was included in the study and house to house visit was carried out till desired sample was met. Data was collected by pre-designed and pre - tested proforma. Data collection was done during school vacation with expectation of maximum chance of availability of adolescents at home. Weight was measured to the nearest 0.1 Kg and a portable weighing machine was used for weight measurement. Height was measured against a non stretchable tape fixed to a vertical wall, with the participant standing on a firm/level surface and it was measured to the nearest 0.5 cm. The adolescents were dressed in light underclothing and without any shoes during the measurement. Overweight and obesity were determined by the BMI percentile as per WHO criteria (85th to less than the 95th percentile – Overweight, ≥ 95 th percentile Obese) [11].

Results

A cross sectional study was conducted to study the magnitude and behavioural risk factors of overweight/obesity among adolescents in an urban area of Ahmednagar District, India. Age and sex distribution reveals that majority (48.3%) were in the age group between 16- 19 years age group. Lowest proportion was found in 10-13 years of age group in both sexes, that is 10% and 5.0% among males and females respectively (Table 1).

Table 1: Age and sex distribution of the study population (n = 300)

Age in years	Male	Female	Total
10-13	30(10)	15(5.0)	45(15)
14-15	70(23.3)	40(13.3)	110(36.6)
16-19	90(30)	55(18.3)	145(48.3)
Total	190(63.3)	110(36.6)	300(100)

Table 2: Distribution of the study population according to the presence of Overweight/obesity (n = 300)

Nutritional status	Frequency	Percentage
Normal	210	70
Overweight	55	18.33
Obese	35	11.67
Total	300	100

Relations between different behavioural factors and overweight and obesity were analyzed and represented in table-3. It was observed that those who consumed cooked food from outside the home were

proportionately more obese / overweight and it was statistically significant. Obesity /overweight was significantly more among the adolescents who consumed first food daily, lead a sedentary life style,

did not practice yoga regularly, resided in a nuclear family, belonged to higher socioeconomic status and consumed alcohol. But no significant relation was

noted between tobacco smoking and obesity / overweight.

Table 3: Association between behavioral factors and overweight /obesity (n = 300)

Behavioral	Overweight/	Normal	Significance
Percentage of weekly meal consisting of food cooked outside home			
Never	02	05	
<25%	40	175	$\chi^2=16.11$
25-50%	33	25	$p=0.006$
>50%	15	05	
Soft drinks/ice creams/sweets consumed per week			
Never/occa-	-	15	$\chi^2=6.33$
3-4 times/ week	24	35	$p=0.04$
Daily	56	160	
Nature of physical activity			
Sedentary	85	189	$\chi^2=3.42$
Moderate	05	21	$p=0.018$
Yoga practicing			
Yes	04	10	$\chi^2=8.8$
No	86	200	$p=0.0025$
Type of family			
Joint	40	33	$\chi^2=10.55$
Nuclear	50	177	$p=0.0003$
Occupational status			
Student	68	170	$\chi^2=11.02$
Unskilled worker	10	10	$p=0.005$
Housewife	04	03	
Others	08	07	
Socio economic status			
Upper class	13	15	$\chi^2=33.8$
Upper middle class	20	35	$p=0.001$
Middle class	47	150	
Lower class		10	
Alcohol consumption			
Daily/occasionally	05	08	$\chi^2=10.5$
never	85	202	$p=0.004$
Tobacco use			
Daily/occasionally	06	10	$\chi^2=1.87$
never	84	200	$p=1.7$

Discussion

Prevalence of overweight /obesity among adolescents is increasing not only in developed countries but also in developing countries too. An emphasis was made in the present study to explore the prevalence and different behavioural risk factors of overweight/obesity among 10- 19 years old urban adolescents. Out of 300 respondents 190 (63.3%) were males and 110 (36.6%) were females. The majority (48.3%) were in the late adolescent group (16- 19 years). The prevalence of overweight/obesity was 30%. Prevalence of overweight/obesity varied in different studies; the reason might be criteria for considering age group of adolescents and cut -off point of determination of overweight/obesity were not the same and due to influences of genetic, behavioural, and environmental factors. The study

reveals that proportion of overweight/obesity was more among the adolescents who consumed cooked food from outside and it was statistically significant. Tiwari P et al observed in Udaipur, Rajasthan that more consumption of outside food was associated with overweight in urban adolescent girls [16]. We observed that intake of sweetened soft drinks 3-4 times per week/daily was related to obesity/ overweight. In a prospective observational study, Ludwig et al [17] found that consumption of soft drinks was related to childhood obesity. Similar relationship between consumption of sweetened soft drinks and adolescent obesity among females was also observed in a study at Taiwan [18]. However, they could not find any relationship between these dietary factors with adolescent obesity in males. In this regard several studies have been conducted to study the relationship between consumption of

sweetened food and obesity [19-22].

Though the study designs, age of the participants, quality and quantity of the sweetened food and criteria for considering obesity were not same but statistical relation was observed between consumption of sweetened drinks and obesity in all these studies. In our study, adolescents' sedentary behaviour and not practicing yoga regularly were found to be risk factors for adolescent overweight and obesity. A similar relation of sedentary life-style and overweight was observed in a study among French adolescents [23]. Obesity/overweight and low physical activity among adolescents and school children was also reported in two different studies, one in China [24] and another in Ludhiana [25].

Though the sedentary behaviour and physical activity are different but they are interlinked with each other. The rise of many sedentary habits like viewing television, videogames and computer use cause less physical activity and thus lead to increase prevalence of overweight and obesity. Contrary to our study no significant difference in sedentary behaviour was found between obese and non-obese adolescents²⁶. However, they noted that high body fat was related to less time spent in vigorous-intensity physical activity in both boys and girls. We also found that there was a significant relationship between overweight/obesity and adolescents who consumed alcohol and belonging to higher socioeconomic status.

However, no significant relationship between obesity and alcohol consumption was reported among the adolescents in the Balearic Islands [27]. Similar to this, significantly more prevalence of overweight and obesity among the adolescents belonging to higher socioeconomic status was also reported in different studies [28]. Contrary to our findings, relationship between obesity and low socioeconomic status was noted in a study among French adolescents [23]. These differences might be due to several reasons. Firstly, the scale used for assessing the socioeconomic status was not the same in different studies.

Secondly, differences in these studies conducted in different countries indicate the role of economic development in the pattern of obesity, thirdly relative accessibility of mass produced foods and drinks and decreasing manual labour due to availability of modern gadgets and transport facility. The study reveals that obesity/overweight was significantly more among the adolescents belonging to nuclear family. Similarly Strauss RS et al (1999) also observed that, overweight in children and adolescents were significantly higher in nuclear and small families than in joint families [28].

Limitations of the Study

The study has some limitations. Firstly as the study was of cross sectional nature, the risk factors of overweight/ obesity identified in this study could merely relate; not a causal one. Secondly we did not know whether these factors preceded or followed the onset of overweight/obesity. Thirdly, as we examined the subject only once, it could not provide indication of the chronology of the overweight and obesity development. Future analytical or experimental studies involving larger population would explore the stronger evidence of causality of this association identified in this study.

Conclusion

Despite the limitations; the study has some positive findings. We have identified consumption of fast food, sedentary life style, higher socio economic status, consumption of alcohol and residing in a nuclear family as risk factors of adolescent overweight and obesity.

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