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Original Research Article

To Study the Impact of Biosocial Characteristics on Nutritional Status in Context to Obesity of School Going Adolescent of Lucknow City

Singh P[1*], Verma N S[1**], Singh SK[2***], Bhattacharya S[1**], Mahdi AA[3**$], Mishra S[1#*], Anjum B[1#*], Gupta A[2#], Sahu KK[2#]

[*]PhD Student, [#*]Senior Research Fellow, [#]MD, [**]Professor, [***]Associate Professor, [**$]Professor & Head, [1]Department of Physiology, [2]Upgraded Department of Community Medicine and Public Health, [3]Department of Biochemistry, King George's Medical University-226003, India.

Corresponding Author: Verma N S

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ABSTRACT

Background & Aim: The Problem of overweight and obesity is not confined only to developed countries but also prevalent in developing countries. The main objective of this study was to ascertain association between biosocial characteristics and nutritional status of adolescents.
Methodology: This was a cross sectional descriptive study, 680 school going adolescents, aged 10-19 years were enrolled by using multi stage random sampling technique. Predesigned and pretested questionnaire was used to elicit information on biosocial characteristics and anthropometric variables. Age and gender specific percentile growth charts of 2007 WHO reference was used to classify subjects as overweight and obese.
Result: The overall prevalence of overweight was 22.7 percent. The prevalence of overweight was 28.1 percent among boys and 18.8 percent among females. Primary predictors for overweight in our study were type of family, education and occupation of mother, multivariate analysis showed that the prevalence of overweight was significantly higher among adolescents whose mothers were working.[OR: 24.7 (95% CI: 8.05-75.9)].
Conclusion: This study pinpoints towards over nutrition amongst adolescents who lived in nuclear family and belonged to upper middle class of socio economic status, biosocial characteristics like type of family, education and occupation of the parents were various factors incriminating for over nutrition in adolescents, which needs to be urgently addressed.

Key Words: Socio- economic status, overweight, BMI.

INTRODUCTION

According to WHO, adolescents are the person aged between 10-19 years. [1] During adolescence there is a gradual transition from childhood to adulthood which is characterized by marked acceleration in growth that begins at the onset of puberty. Anthropometric assessment during adolescent phase is more complex than children's because of transition in body composition and varying timing of growth spurt. Anthropometric assessment of adolescent based on BMI appears to be relevant in health care routine

and in school health. World Health Organization (WHO) reports suggest that in SEAR 20.0 percent of adolescents constitute in the population of these countries that suffer from malnutrition which adversely impact their health & development. [2] According to the World Health Organization (WHO) overweight and obesity is one of the most important health concerns. [3] And it is major health issue in countries undergoing economic transition. [4] The consequences that are related with adolescent obesity during adolescence [5,6] and adulthood [7] includes incidence of coronary artery diseases and hypertension, [8,9] diabetes. [10]

Adolescence being transitional period between childhood and adult provides an opportunity to prepare for healthy life of these adolescents and to prevent the onset of nutrition related chronic diseases in adult life therefore there is a need to identify specific nutritional issues.

Objectives

- To ascertain the association between biosocial characteristics and nutritional status with special reference to obesity among school going adolescents in urban area of Lucknow.

MATERIALS AND METHODS

This was a cross sectional study which was carried out amongst school going adolescents of urban Lucknow. Multi stage random sampling technique was used to select the requisite number of school going adolescents.

At first stage Lucknow has been divided into two zones- Cis Gomti and Trans Gomti, two zones each were randomly selected from Cis and Trans Gomti respectively. At the second stage, each zone was further divided into two parts and from each part one senior secondary school was randomly selected, thus a total of four schools were randomly selected. At the third stage from the selected schools, students of classes VI to XII aged 10-19 years were selected through systemic random sampling and if the designated student was not cooperative during the interview, then the subject was considered as non respondent and the next student was enrolled in the study.

The weight of the respondents was recorded without heavy clothing, using an electronic weighing scale with an error of $\pm$ 100 g, height was measured to the nearest of 0.5 cm with subject standing barefooted using portable stadiometer, calibration of the instrument was done weekly with the known standards. BMI was calculated using standard equation. The cut off value for non obese was 15^{th} to $<85^{th}$ percentile and for overweight it was $>85^{th}$ percentile of 2007 WHO reference standards. A total of 720 school going adolescents of urban Lucknow were interviewed by using predesigned and pretested schedule. Out of these 40 subject's BMI was $<15^{th}$ percentile (underweight) so they were not included. Information was collected on type of family they belong, education and occupation both the parents and their socio economic status was assessed by modified Kuppuswamy classification. The statistical analysis was carried out, using multiple logistic regression analyses and $p<0.05$ was taken as the significant level for all the statistical tests.

RESULTS

A total of 680 school going adolescents were included in the study drawn from four randomly selected urban schools by multistage random sampling technique.

A maximum of (56.5 %) adolescent were in the age group of 10-13 years, out of which 57.1 percent were girls. About 72.5 percent of school going adolescent lived in nuclear family, A maximum of adolescents mother's (78.4%) and father (81.2%) were

educated upto intermediate and above, about 46.9 percent of adolescents belonged to upper middle class (Table 1).

Table 1: Distribution of biosocial characteristics of school going adolescents.

Biosocial Characterstics		Total	
Variables	Sub Variables	No	%
Age Group	10 - <14	384	56.5
	14 – <17	185	27.2
	17 – 19	111	16.3
Sex	Male	292	42.9
	Female	388	57.1
Type of Family	Joint	187	27.5
	Nuclear	493	72.5
Education of Mother	Below high school	147	21.6
	Intermediate & above	533	78.4
Occupation of Mother	Professional	24	3.5
	Clerk, Shopkeeper	25	3.7
	Skilled Worker	73	10.8
	Housewife	557	81.9
Education of Father	Below high school	128	18.8
	Intermediate above	552	81.2
Occupation of Father	Professional	335	49.3
	Clerk, Shopkeeper	120	17.6
	Skilled Worker	98	14.4
	Unskilled/unemployed	127	18.7
*Socio economic Status	Upper Class	16	2.4
	Upper Middle Class	319	46.9
	Middle Class	218	32.1
	Lower Middle Class	50	7.4
	Lower Class	77	11.3

*Modified Kuppuswamy Scale

According to WHO age and gender specific percentile growth chart criteria the overall overweight adolescents were 22.8 percent, of which 28.1 percent boys, 18.8 percent girls were overweight and it was found statistically significant. The prevalence of overweight (63.2 %) was higher amongst adolescents who lived in nuclear family and this was significantly higher ($p<0.01$) than amongst those living in joint family (36.8%). Similarly overweight was significantly higher among those adolescents (27.9 %) whose mother's education was intermediate and above than those whose mother's education (6.1%) was below high school. The prevalence of overweight was found higher in upper and middle class and this was statistically significant (<0.01). (Table 2).

To adjust for potentially confounding variables and to study the possible mediating factors, bivariate logistic regression analysis was carried out in this study. Sex, age group, type of family, education and occupation of both the parents (mother & father) and socio economic status were independent variables whereas overweight was dependent variable, the risk of overweight was significantly less ($p<0.05$) amongst those adolescents who lived in joint family [OR: 0.505 (95% CI: .319-.799)], the prevalence of overweight was significantly lower ($p<0.01$) among adolescents whose mother's literacy status was below high school [OR: 0.239(95% CI: .108-.528)], the risk of overweight was 24

times higher in adolescents whose mothers were working, [OR: 24.7 (95% CI: 8.05-75.9)] than amongst those whose mothers were housewife (Table 3).

Table 2: Association of biosocial characteristics with overweight school going adolescents.

Biosocial Characteristics						
Variables	Sub Variables	Non Obese		Overweight & Above		p value
		No	%	No	%	
Age Group	10 – <14	285	54.3	99	63.9	0.014
	14 – <17	143	27.2	42	27.1	
	17 – 19	97	18.5	14	9	
Sex	Male	210	40	82	28.0	0.003
	Female	315	60	73	18.8	
Type of Family	Joint	130	24.8	57	36.8	0.002
	Nuclear	395	75.2	98	63.2	
Education of Mother	Below high school	138	93.9	9	6.1	<0.001
	Intermediate & above	387	72.6	146	27.9	
Occupation of Mother	Professional	19	79.2	5	20.8	<0.001
	Clerk, Shopkeeper	4	16.0	21	84.0	
	Skilled Worker	19	25.7	55	74.3	
	Housewife	483	86.7	74	13.3	
Education of Father	Below high school	123	96.1	5	3.9	<0.001
	Intermediate above	402	72.8	150	27.2	
Occupation of Father	Professional	219	65.4	116	34.6	<0.001
	Clerk, Shopkeeper	105	88.2	14	11.8	
	Skilled Worker	78	79.6	20	20.4	
	Unskilled/unemployed	123	96.1	5	3.9	
Socio economic Status	Upper Class	219	64.4	183	34.6	<0.001
	Middle Class	183	84.3	34	15.7	
	Lower Middle Class & below	123	96.1	5	3.9	

Table 3: Multivariate analysis for overweight adolescents.

Biosocial characteristics		B	Odds Ratio	95% CI
Type of Family	Joint	-0.684	0.505	.319-.799
	Nuclear	1		
Education of Mother	Below High School	-1.43	0.239	.108-.528
	Intermediate and above	1		
Occupation of Mother	Professional	0.168	1.182	.419-3.34
	Clerk, Shopkeeper	3.208	24.7	8.05-75.9
	Skilled Worker	2.79	16.29	8.90-29.8
	Housewife/unemployed	1		

*In logistic regression variables included were Type of family, Age group, Sex, Education & occupation of mother & father.

DISCUSSION

The present study showed the prevalence of overweight and obesity pooled together in adolescent boys (28.1%) and girls (18.8 %) as per the WHO 2007 reference of BMI for age criteria. These findings are in the concurrence with the findings of studies conducted in Delhi, Gujarat, Kerala and Ludhiana where they found near similar prevalence of overweight (13.9%-17.7%) and obesity (5.0%-11%) [11-14] was found.

A study done among 11-16 year adolescents showed the prevalence of overweight and

obesity to be 45.7 percent. [15,16] This could be due to different factors included in the study like age groups, different study area like school based community based, rural or urban areas, subjects coming from different socio economic backgrounds.

School based data on obesity in India shows a prevalence of 5.6-24% among children and adolescents. [17] The large range in the reported prevalence of overweight and obesity could be due to regional differences, non-uniformity in the criteria used to classify socio economic status and, the different age range of the children studied.

A study done in Goa on 10-19 years adolescents showed 3.3 percent as overweight, [18] 3.4 percent children were found obese in study done in Punjab among 10-19 year adolescents. [19] Similarly 3.5 percent overweight and 0.4 percent were found as obese amongst 11-17 years of adolescents in Shimla,4.2 percent and 0.8 percent children were found overweight and obese respectively in a study done in Manipuri children aged 12-19 years. [20,21] These differences again could be attributed to different study settings and selection criteria used in those studies.

This study showed higher prevalence of overweight among adolescent boys (28.1%) than in girls (18.8%). These results are comparable with a study done among 10-19 years old adolescents of Delhi where the prevalence of overweight and obesity (pooled together) in males and females was 25.0 percent and 19.1 percent respectively as per the NCSH/CDC BMI for age criteria (>85th percentile for BMI). [11]

Another finding which was found to be statistically significant was that a higher number of adolescents of nuclear family were overweight as compared to those living in joint family (63.2% v/s 36.8%). Similar findings were observed among 12-16 year children of Mangalore (1.89% v/s 1.42%) [22] and among 10-19 year adolescents of Delhi.(23.6% v/s 17.3%). [11] Similarly in another study the prevalence of overweight and obesity was significantly ($p<0.05$) higher among adolescents who lived in nuclear family (7.6%) as compared to those who lived in joint family (4.4%). [23] This may be due to the reason that adolescents living in nuclear families are over nourished than adolescents living in joint families.

The findings of the present study showed that as the socio economic status increases the proportion of overweight subject also increases.

Similar results were found in a study in which the prevalence of overweight was 4 times higher among the adolescents of high socio economic status, [24] The prevalence of obesity was found to be directly proportional to the socio economic status, highest being in upper class and this could be due to the difference in dietary pattern and sedentary behavior of adolescents belonging to the upper class as compared to those of lower socio economic status.

CONCLUSION

The findings of the present study showed that the percentage of overweight adolescents is high in Lucknow which is in accordance with studies from other parts of India. This study also pinpointed towards over nutrition amongst adolescents who lived in nuclear family and belonged to upper middle class. The result also highlighted the role of mother's occupation and education with a higher proportion of overweight adolescents found in children of working mothers and those of educated below high school. Therefore to address the issue of over nutrition, a comprehensive parent as well as school targeted strategies should be formed aiming to improve nutritional status of school going adolescents through appropriate nutritional intervention programmes.

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Conflicts of interest: The authors declare that there is no conflict of interest

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