PREVALENCE OF CHILDHOOD OBESITY AMONG SCHOOL GOING CHILDREN AND ITS ASSOCIATED SOCIO-DEMOGRAPHIC FACTORS IN SHIRUR VILLAGE, BAGALKOT

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ABSTRACT

Introduction: The rise non-communicable diseases in India is not restricted to urban localities but fast spreading to rural areas.

Objectives: The study was conducted to assess prevalence of obesity among school going children and to find correlation of various socio-demographic factors affecting obesity in children in this area.

Methodology: An institution based cross-sectional study was conducted among 1308 in rural schools. Students were interviewed and height and weight were recorded.

Results: The prevalence of overweight and obesity was 2.52% and 0.99% among school children. Prevalence of overweight was significantly high in children studying in middle school (5th, 6th and 7th standard), private schools, literacy level of mother more than SSLC, father having occupation in the category employed or own business and not participating in outdoor games. Prevalence of obesity was significantly high in female gender, children with father having occupation in the category employed and those participating in sedentary activities like TV watching, mobile phones etc. for more than one hour per day.

Conclusion: Decreased outdoor playing, increased sedentary activities like TV watching and mobile phone usage among school children are important risk factors for childhood obesity.

Key words: School Children, Childhood Obesity, Rural, BMI for age

INTRODUCTION

Over-weight and obesity represent a rapidly growing threat to the health of population in an increasing number of countries. Indeed, these are now so common that they are replacing more traditional problems such as under nutrition and infectious diseases as the most significant causes of ill health. It is one of the most serious public health challenges of the 21st century. [1] The problem is global and is steadily affecting many low and middle-income countries, particularly in urban settings. [1] The prevalence has increased at an alarming rate.The number of overweight or obese infants and young children (aged 0 to 5 years) increased from 31 million globally in 1990 to 44 million in 2012. [2] Increasing trends in child overweight have

been noted in most world regions, not only in the developed countries, where prevalence is highest (15% in 2011) but also in the developing countries. [3]

`Aetio-pathogenesis of childhood obesity is multifactorial and includes genetic, neuroendocrine, metabolic, psychological, environmental and socio-cultural factors.Today man is living in the obesogenic environment with all the comforts of modern lifestyle. The obesogenicity of an environment has been defined as "the sum of influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals or populations". [4] The theory that the modern way of living encourages the consumption of energy and discourages the expenditure of energy. It is

thought that the wide availability of food that is energy dense, palatable and inexpensive, combined with increasingly sedentary habits, favours an excess of energy intake over expenditure. [5]

The exact prevalence of the condition is unknown in our country because of lack of national data. Although many studies are conducted all over the country, which suggest that childhood obesity is quite alarming in India. Most of the studies till now are conducted in urban affluent schools and the trend in rural areas have not been studied in detail so far. Hence an attempt is made to study the prevalence of childhood obesity and its associated risk factors among all school going children of Shirur village of Bagalkot district, which is located in north-western part of Karnataka state.

AIMS AND OBJECTIVES

The study was conducted to assess prevalence of obesity among school going children of Shirur, a rural field practice area of S. N. Medical College, Bagalkot and also to find correlation of various socio-demographic factors affecting obesity in children in this area.

MATERIALS AND METHODS

An institution based cross-Sectional Study was conducted from 1st June 2013 to 31st August 2014 in Shirur village a rural field practice area of S. Nijalingappa Medical College, Bagalkot district, Karnataka. All the 1414 school children of Shirur village were taken as study subjects, 102 children could not be contacted even after repeated three visits to school hence total study subjects were 1312 children and response rate was 92.7%.Sample size was calculated using the prevalence of obesity to be 11.1 %(according to Pandey S et al in 2014 in the age group of 5 to 15 year). [6] Sample size was calculated using formula Sample size = 4*P*Q/L². So minimum sample size was rounded off to 803subjects.Study protocol was approved by the Institution's Ethical Committee.

After obtaining permission from school authorities, students were personally interviewed with the help of oral questionnaire. Information regarding details of students like personal details (name, age sex etc.), family details, and life style details was collected by personal interview using pre-structured and pre-designed proforma. Parameters of height and weight were measured and recorded following completion of the questionnaire. Repeated 2 visits were done to the same school to examine those students who were absent at the previous visit. Body Mass Index (BMI) was calculated based on the formula-Weight (Kg)/Height (m²).

The results were compared against the body mass index for age percentiles of both sexes (BMI percentile charts WHO 2007). Data was entered in Microsoft Excel 2013 and analysed using SPSS version 20 (trial version). Chi square test was used where relevant to find association between variables and if expected value is <5 in 20% of cells in the table, then Fishers Exact Test was used.

RESULTS

There are total 1308 school children between 6-15 year age group. The overall prevalence of overweight and obesity was found to be 2.52% and 0.99% respectively. The study showed prevalence of overweight was significantly high (4.1%) in children studying in middle school followed by primary school (2.2%) and least in high school (1.2%). Overweight was significantly more in children studying in private school, those with literacy levels of mother of more than SSLC and fathers occupation in category of employed or own business. Children participating in outdoor games had significantly less overweight (2.3%) as compared to those not participating in outdoor games (6.3%).

The study reflected prevalence of obesity was significantly high (1.6%) in female children as compared to male children (0.4%).School children with fathers occupation in category of employed had highest (2.3%) proportion of obesity followed by 1.8% in own business, 0.5% in agricultural labour and least 0.3% in coolie. The prevalence of obesity was more (3.1%) in children not participating in outdoor games as compared to children participating in (0.8%) outdoor games, however it was not statistically significant. School children involved in sedentary activities like TV watching, mobiles for more than one hour per day had significantly more obesity (1.8%) as compared to those with sedentary activities less than one hour per day (0.4%).

Overweight and obesity was not significantly associated with age distribution of school children, religion, father's education, mother's occupation, type of family and participation in indoor games.

DISCUSSION

India is in a state of epidemiological transition and non-communicable diseases like obesity are fast spreading in rural areas. In this study conducted in Shirur village of Bagalkot district Karnataka, we have shown prevalence of overweight and obesity are 2.52% and 0.99% respectively among school children between 6-15 years of age. Similar studies by Ashtekar et al, Vohra et al and Mahajan et al have reported increased prevalence of overweight and obesity in various parts of India. [7, 8, 9]

Table 1: Association of study variables with obese and overweight participants

Variables	Obesity (n=13)	Overweight (n=33)	Total Participants (n=1308)	P value	
				OB vs Non OB	OW vs Non OW
Age					
6-10years	5(0.9)	15(2.9)	504	0.996	0.408
11-15years	8(0.9)	18(2.2)	804		
Sex					
Male	3(0.4)	14(2.0)	689	0.03¶	0.23
Female	10(1.6)	19(3.1)	619		
School					
Primary	4(0.8)	11(2.2)	493	0.64	0.02
Middle	6(1.5)	17(4.1)	413		
High	3(0.7)	5(1.2)	402		
Type of school					
Govt.	8(1.4)	8(1.4)	591	0.2	0.01
Private	5(0.7)	25(3.5)	717		
Religion					
Hindu	12(1.0)	29(2.4)	1198	1.000@	0.352@
Muslim	1(0.9)	4(3.6)	110		
Father education					
Illiterate	2(0.7)	6(2.2)	278	1.000@	0.66
Literate	11(1.1)	27(2.6)	1030		
Father literacy level					
<SSLC	7(1.1)	21(3.2)	654	1.000@	0.11
>SSLC	4(1.1)	6(1.6)	376		
Mother Education					
Illiterate	4(0.8)	11(2.2)	487	0.43@	0.31
Literate	9(1.1)	22(2.7)	821		
Mother literacy level					
<SSLC	6(0.8)	16(2.2)	732	0.064@	0.024¶@
>SSLC	3(3.4)	6(6.7)	89		
Father occupation					
Agricultural labour	2(0.5)	4(0.9)	418	0.034¶	0.016¶
coolie	1(0.3)	8(2.1)	388		
Own business	6(1.8)	13(3.9)	331		
Employed	4(2.3)	8(4.7)	171		
Mothers occupation					
Agricultural labour	3(1.2)	4(1.6)	257	0.765	0.843
coolie	2(0.6)	10(3.0)	328		
Own business	1(0.6)	4(2.6)	156		
Employed	0(0.0)	1(2.3)	44		
Housewife	7(1.3)	14(2.7)	523		
Type of Family					
Nuclear	11(1.2)	26(2.7)	945	0.534@	0.3
Joint	2(0.6)	7(1.9)	363		
Outdoor games					
No	3(3.1)	6(6.3)	95	0.062@	0.028¶@
Yes	10(0.8)	27(2.3)	1213		
Duration of outdoor games					
>1hr	8(1.1)	16(2.2)	729	0.331@	0.928
<1hr	2(0.4)	11(2.2)	484		
Indoor games					
No	7(1.1)	14(2.2)	634	0.69	0.48
Yes	6(0.9)	19(2.8)	674		
Duration of Indoor games					
>1hr	4(0.8)	15(2.9)	525	0.618@	1.000@
<1hr	2(1.3)	4(2.7)	149		
Sedentary					
No	0(0.0)	1(0.6)	173	0.237@	0.113@
Yes	13(0.9)	32(2.8)	1135		
Duration of sedentary					
>1hr	2(0.4)	16(3.0)	527	0.02¶	0.68
<1hr	11(1.8)	16(2.6)	608		
Total	13	33	1308		

OB-Obesity, OW-Overweight, *-Significant, @Fischer's Exact test

In the our study, the prevalence of overweight was highest in middle school, followed by primary school and least in high school children. Vohra et al conducted a study in 2011 in Lucknow city among 407 school children and found overall overweight and obesity to be higher in students of more than class 8th standard as compared to less than 8th standard. [8] Dhole et al also reported highest prevalence of overall overweight and obesity among class 7 students. [10] Children studying private school and father occupation are important determinants of overweight as found in our study. Similar finding are reported by Bharathi et al, laxmaiah et al. [11, 12] In the present study children with mothers education more than SSLC were at 3.23 times more at risk of developing overweight as compared to those with mothers education less than SSLC. Similar finding was shown by Bharathi et al, where children with parents education more than 6th standard had more overweight/obesity as compared to those with parents education less than 6th standard. [11]

Prevalence of overweight was significant high (6.3%) in children not participating in outdoor games as compared to those participating in outdoor games (2.3%) with almost 3 times more chances of developing overweight. Similar finding was reported by Bansal et al, Patnaik et al and Vohra et al. [13, 14, and 8]

In this study, obesity was significantly more in female children with 3.75 times more risk as compared to male children. Similar finding was reported by Sanghamitra et al, Ashtekar et al, Dhole et al and Mahajan et al. [15, 7, 10, and 9] Obesity was more common in school children with father's occupation in employed category. Similar finding was shown by Bharathi et al. [11] Obesity was almost 4 times more common among children not participating in outdoor games as compared those participating in outdoor games. School children involved in sedentary activities more than one hour per day had significantly more obesity (1.8%) as compared to those with sedentary activities less than one hour per day (0.4%). Similar finding was reported on outdoor games and sedentary activity by Bansal et al and Patnaik et al. [13, 14]

CONCLUSION

From the present study in can be concluded that rural areas are not immune to modern diseases of lifestyle like childhood obesity. Decreased outdoor playing, increased sedentary activities like TV watching and mobile phone usage among school children are important risk factors for development of childhood obesity. Health education regarding importance of physical activity, hazards of sedentary activity and giving extra importance to female school children is key for limiting the spread of childhood obesity.

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