Original Research Article

Study of life style determinants of overweight and obesity among school going adolescents in urban Jabalpur, Madhya Pradesh, India

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ABSTRACT

Background: Obesity has become a colossal epidemic causing serious public health concern and contributes to 2.6 million deaths worldwide every year. Indian data regarding current trends in childhood obesity are emerging. Considering the fact that India has rapidly growing middle class easily habituated for enormous lifestyle changes in recent decades responsible for developing potential platform for obesity among youths. Accordingly, the objective of the present study was to evaluate the associations between overweight, obesity and several lifestyle factors, including physical activity, sedentary behaviours among adolescents aged 10-17 years.
Methods: A cross-sectional study was carried out in two schools of Jabalpur located around medical college area , 184 students effectively interviewed by predesigned questionnaire regarding Socio-demographic profile ie current residence, age, mothers educational and occupational status and family size and life style practices like the physical activity questions designed to asses typical time spent per day on games and outdoor activity, on sedentary activities, including television (TV) viewing, video games, and computer and internet use. Data entry and data processing were carried out using the SPSS version 17 software and data analyses were applied using the appropriate statistical tests of significance.
Results: Prevalence of obesity and overweight: Of the 184 adolescents studied, 7.6% were obese and 2.2% were pre-obese.
Conclusions: Among all of the lifestyle factors assessed, overweight and obesity exhibited associations with less frequent physical activity, and more television and internet use.

Keywords: Adolescents, Life style, Obesity, Overweight

INTRODUCTION

Obesity has become a colossal epidemic causing serious public health concern and contributes to 2.6 million deaths worldwide every year.[1] Indian data regarding current trends in childhood obesity are emerging. A recent study conducted among 24,000 school children in south India showed that the proportion of overweight children increased from 4.94 per cent of the total students in 2003 to 6.57 per cent in 2005 demonstrating the time trend of this rapidly growing epidemic.[2] The proportion of school-age children affected will almost double by 2010 compared with the most recently available surveys from the late 1990s up to 2003.[3] Current evidence indicates that obesity is a multi-factorial condition influenced by many variables, including genetic, demographic and lifestyle factors.[4] Genetic and demographic variables such as family history of obesity, age, ethnicity and sex can not be modified. However, obesity-associated lifestyle factors are often modifiable. In fact, previous research has shown that childhood obesity is associated with many lifestyle factors,

including sedentary behaviours, physical inactivity and unhealthy dietary choices.[5-10]

Information on lifestyle factors associated with obesity in adolescents in India are currently limited and the available data indicated that unhealthy lifestyle practices were generally correlated with BMI in Indian children and adolescents in fewer studies Considering the fact that in India has experienced enormous lifestyle changes in recent decades, rapidly growing middle class and rise of obesity among youths.[11] Therefore, a better understanding of the relationships between obesity and lifestyle factors is necessary for effective prevention and management of obesity in youth. Also, local studies using a representative sample and validated instruments to assess lifestyle factors are particularly scarce. Accordingly, the objective of the present study was to evaluate the associations between overweight, obesity and several lifestyle factors, including physical activity, sedentary behaviours among adolescents aged 10–17 years. Institutional ethical clearance was obtained prior to the study.

METHODS

Research setting and study design

A cross-sectional study was carried out in two, schools of Jabalpur located around medical college area. 100 students from each school were purposely selected for study .Out of these 16 students not cooperated ,were not willing to pacipate so 184 students effectively interviewed .The total 184 students included in our study from the 5th to 12th grades were of age 10-17 years.

Data collection tools and techniques

After a brief orientation, selected school children were subjected to the following experiments

Anthropometric measurements

The weight was measured using a commercial scale with an accuracy of ±100 g. The subjects asked to remove their footwear and wear minimal clothes before weighing them. The standing body height was measured to the nearest 0.5 cm by using a commercial stadiometer with the shoulder in a relaxed position and arms hanging freely and without shoes. The scales were recalibrated after each measurement. All measurements were carried out outside the class- room on individual after an interview with food frequency questionnaire.

Adolescents, overweight and obesity are defined using age and sex specific normograms for body mass index (BMI). Adolescents with BMI equal to or exceeding the age-gender-specific 95th percentile are defined obese with ≥85 percentiles were considered overweight, while those with <85 percentiles were considered desirable or lean.[13]

A predesigned questionnaire regarding Socio-demographic profile ie current residence, age, mothers educational and occupational status and family size , and life style practices like addiction habit, the physical activity questions designed to asses typical time spent per day on games and outdoor activity, on sedentary activities, including television (TV) viewing, video games, and computer and internet use were utilized as study instrument:

Assessment instrument was developed in a group discussion among students and faculty of department of community medicine further approved with pretesting the questionnaire in schools.

Data management and data processing

Data entry and data processing were carried out using the SPSS version 17 software (SPSS Inc.). Both the descriptive and inferential data analyses were applied using the appropriate statistical tests of significance (chi-square), A multivariate binary logistic regression model was generated by including study variables Confidence interval of 95% and significant difference of ≤0.05 was found to be valid and convenient.

RESULTS

A total of 184 school children were included with their age ranging from 10 to 17 year (mean age, 15.64±1.42 years) and mean weight 49.39±12.27 and mean height 161.53±10.60.

Prevalence of obesity and overweight: Of the 184 children studied, 18 (9.7%) were obese and pre-obese. Among total14 (7.6%) were obese and 4 (2.2%) were pre-obese. With regard to gender-specific BMI 8.7%, males whereas 12.3% females were obese and overweight. Over-weight and obese were higher in children of illiterate mothers, female students, among the older age group 14-17 years students. Obese and overweight were more who skip breakfast (20%) it was found statistically significant with p value <0.05, surprisingly obesity and overweighs were found higher among Tiffin user 12.3% as compared to canteen.

Participation in cultural activities is also a significant predictor and surprisingly obese and overweighs were participate frequently in cultural events as compared to non-obese group. Obese and overweighs were more (19.9%) among those who don't do exercise and don't play outdoor games as compare to those who regularly exercise and play outdoor games (7.5%) and it was found statistically significant with p value <0.05.

Binary logistic regression was applied for life style factors and dietary habits, by using the dependent variables overweight and obesity revealed that change in eating habits(routine consumption of tea and coffee) during exams (OR: 2.75) were positively associated with

obesity and overweight while having breakfast regularly (OR=0.32), and negative family history of obesity (OR=0.35) were negatively associated with obesity and overweight indicating its protective effect on obesity and overweight among adolescents students. Also, it was found in our study family history of diabetes was significantly associate with obesity and overweight (OR 5.152).

The odds of adolescents spending >5hrs per day on playing video games/whatsapp/surfing net (OR=5.99), watching television while having meals (OR=1.64), change in routine consumption of tea or coffee (OR=2.27) of being obese or overweight were more as compared to the other counterparts, though these were not found to be statistically significant.

Table 1: Anthropometric sample characteristics in relation to the BMI classification.

Attribute	BMI	Number	Mean	Std. deviation	Std. Error Mean	Significance
Height	Non obese	166	161.2994	10.5163	0.8162	0.337
	Pre obese and obese	18	163.8333	11.3979	2.6865	0.377
Weight	Non obese	166	46.82	9.15	0.71	0.000**
	Pre obese and obese	18	73.22	12.42	2.93	0.000**
BMI	Non obese	166	17.8864	2.4824	0.1927	0.000**
	Pre obese and obese	18	27.1231	2.3045	0.5432	0.000**

Table 2: Association with obesity and overweight with socio-demographic, life style determinants (N=184).

Variables	Normal	Obesity and overweight	Total	p value
Age				
10-13	38 (90.5%)	4 (9.5%)	42 (22.83)	0.949
14-17	128 (90.1%)	14 (9.9)	172 (77.17)	
Sex				
Male	116 (91.3%)	11 (8.7%)	127 (69.02)	0.545
Female	50 (87.7%)	7 (12.3%)	57 (30.98)	
Mothers education				
Illiterate	66 (89.2%)	8 (10.8%)	74 (40.22)	0.442
Literate	100 (90.9%)	10 (9.1%)	110 (59.78)	
Socioeconomic status				
Upper	133 (90.5%)	14 (9.5%)	147 (79.89)	0.784
Middle	30 (88.2%)	4 (11.8%)	34 (18.48)	
Lower	3 (00.0%)	0 (0)	3 (1.63)	
Participation in cultural activities				
Yes	94 (86.2)	15 (13.8)	109 (59.54)	0.04*
No	72 (96)	3 (4)	75 (40.76)	
Outing for Dinner or lunch				
Weekly	16 (72.7)	6 (27.3)	22 (11.96)	
Monthly	42 (95.5)	2 (4.5)	44 (23.91)	0.021*
More than a month duration	57 (93.4)	4 (6.6)4	61 (33.15)	
Never	51 (89.5)	6 (10.5)	57 (30.98)	
Party with friends				
Frequently	78 (86.7)	12 (13.3)	90 (48.91)	0.4
Occasionally	20 (90.2)	5 (7.5)	25 (13.59)	
Out door Game and exercise				
Regular (>5times/week)	136 (92.5)	11 (7.5)	147 (79.89)	0.036*
Not regular (<5times/week)	30 (81.1)	7 (19.9)	37 (20.11)	
Addiction (tobacco/smoking)				
Yes	10 (83.3)	2 (16.7)	12 (6.522)	0.406
No	156 (90.7)	16 (9.3)	172 (93.48)	
Total	166 (90.22)	18 (9.78)		

Table 3: Logistic regression model for life style factors and their risk association with obesity and overweight.

Life style factors	Adjusted odds ratio	95% CI	p-value
Hours spend playing video games/whats app/ surfing net			
0-2 hrs per day	1.422	0.17-11.7	0.744
3-5	0.824	0.05-14.4	0.894
>5	5.998	1.5-8.6	0.150
Never	-	-	-
Watching T.V while taking meal			
Yes	1.641	0.52-5.25	0.402
No	-	-	-
Breakfast everyday			
Regularly	0.319	0.11-.89	0.465
Not regularly	-	-	-
Change in eating habits during exam			
Yes	1.5	1.67-4.9	0.03*
No	-	-	
Change in routine consumption of tea, coffee			
Yes	2.247	0.87-5.8	0.09
No	-	-	-
Change in sleep during exams			
Yes	1.029	0.37-2.8	0.405
No	-	-	-
History of obesity			
No	0.347	0.124-35	0.04*
Yes	-	-	-
Family history of diseases			
Diabetes Mellitus	5.152	1.619-16.39	0.006*
Hypertension	1.232	0.23-6.51	0.806
Endocrinal dysfunction	0.004	0-3.91	0.822
Others	0.944	0.1814.93	0.946
Absent	-	-	-

*Significant with p value<0.05.

DISCUSSION

Lifestyle practices is an important determinants of health as Economic development of India has changed lifestyle habits.[14] Modern life style practices coupled with physical inactivity have likely contributed to the increase in the prevalence of overweight and obesity in the children.[15] Overall prevalence obesity and overweight adolescents in our study was found to be 9.7%. Among total 184 adolescents surveyed 7.6% were obese and 2.2% were pre-obese which was consistent with study done in Delhi showed prevalence of obesity among affluent class students 7.4%.[16] Similar studies are conducted India for prevalence of obesity and results are comparable to our study with respect to obesity prevalence.[17-20]

With regard to gender-specific BMI, among males 8. 7% whereas 12.3% among girls were obese and overweight showing higher prevalence among girls. One of the reasons being boys are more physically active than girls.

Deheeger M et al mentioned Boys appear to engage in higher levels of physical activity, report more participation in sports, and have higher levels of aerobic fitness than females.[21] Further gender differences in activity energy expenditure and reported physical activity become more apparent approaching puberty, because of the reported decline in physical activity in girls prior to puberty.[22]

In our study sedentary habits less exercise and less outdoor activities were more among obese and overweight, the difference were found statistically significant and odds of being obese or overweight among adolescents spending >5 hrs per day on playing video games/whatsapp/surfing net was 5.99. In a similar study by Laxmaiah et al logistic regression analysis revealed that the prevalence of overweight was 3 times higher in those not participating in outdoor games (OR: 2.75; CI: 1.56, 4.72), and 1.92 times higher in those watching television >or =3 h/d (OR: 1.92; CI: 1.16, 3.18).[23]

Owen N et al mentioned in their study showed an inverse relationship between obesity and physical activity in children and a positive relationship between obesity and physical inactivity.[24]

In our study urbanization related behaviors like weekly outing for lunch was significantly higher among obese and preobese 27% as compared who never visited or visited monthly (10.5%, 4.5% respectively). In similar studies on life style and obesity shown to promote obesity include frequent consumption of meals at fast-food outlets consumption of oversized portions at home and at restaurants.[25-28]

Study limitation. Due to limitation of resources done at small sample was taken. Results cannot as such generalized in general population despite best possible effort was put to select representative population.

CONCLUSION

The present study examined the associations of several lifestyle factors with overweight/ obesity in adolescents. Among all of the lifestyle factors assessed, overweight and obesity exhibited significant associations with less frequent vigorous physical activity, and skipping of breakfast, more use of television and internate. As adolescents is a important period for lifestyle adaptations, changes must include education, research and intervention, through the involvement of policy makers, health care providers, educators and parents for promoting a healthy diet and active lifestyles and it should be a national public health priority.

ACKNOWLEDGEMENTS

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