

PHYSICAL AND PSYCHOLOGICAL HEALTH OF COLLEGE STUDENTS

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ABSTRACT

Background: Childhood obesity has become a serious public health problem because of its strong association with adulthood obesity and the related adverse health consequences. No published information is available on the prevalence of childhood obesity in Punjabi population.

Objective: The aim of the study is to determine the prevalence of childhood overweight and obesity and its risk factors in primary school children of Ludhiana city.

Methods: This is a cross-sectional study which was focused on the prevalence of childhood obesity and overweight in primary school children of Ludhiana city of Punjab. This study include 1200 participants (both boys and girls aged 6 to 13 years old) by following simple random procedure.

Results: The prevalence of overweight and obesity was found 13.2% (95% CI: 11.33 - 15.17) and 17.8 % (95% CI: 15.59 - 19.91) in the present study, respectively and also the prevalence of overweight and obesity among boys and girls were 13.6% (95% CI: 10.83 - 16.41), 22.1% (95% CI: 18.69 - 25.45), 12.9% (95% CI: 10.26 - 15.54) and 13.7% (95% CI: 11 - 16.42) respectively. There were significant difference found in weight for height ($p = 0.015$) and weight ($p < 0.001$) between boys and girls..

Conclusion: These data shows that a high prevalence of overweight and obesity in primary school children of Ludhiana city Punjab. Positive energy balance with higher fat intake, family high income, parents high education seem to be among the underlying factors for increasing prevalence of childhood obesity.

INTRODUCTION

Obesity is defined as an excessive accumulation of body fat, and childhood obesity is defined as a weight-for-height in excess of 120 percent of the ideal. The mechanism of obesity development is not fully understood and it is believed to be a disorder with multiple causes. Environmental factors, lifestyle

preferences, and the cultural environment play pivotal roles in the rising prevalence of obesity worldwide. In general, overweight and obesity are assumed to be the results of an increase in caloric and fat intake and the overweight and obesity in childhood are known to have significant impact on both physical and psychological health. Studies of obesity were often used weight for height measures as indicators of obesity. These had many problems and must be regarded as only approximating to the degree of fatness. The formula was used to free of appreciable height bias. In adults BMI (body mass index) $BMI (kg/m^2) = \text{weight in kilograms} / \text{height in meters}^2$ has commonly used. But, in childhood the index has been limited use as it vary with age. Body mass index can be related, however, to the index of a theoretical child of the same age with weight and height on the 50th centiles of growth standards to give a % body mass index. This was very useful for the children, when the comparison related with weight of children of different ages. Values were <90% =underweight; 90-110% =normal weight; >110-120%=overweight; >120% = obese .

II.RATIONAL OF THE STUDY

Children are becoming increasingly vulnerable to overweight and obesity around the world. It is among the easiest medical conditions to recognize but the most difficult to treat and now a day's one of the most alarming public health issues. It also leads to adult obesity along with chronic health problems such as diabetes, asthma, sleep apnoea, gallbladder disease, elevated blood pressures and elevated total cholesterol. But no information on the prevalence of childhood obesity among the people of Punjab has been found in the published literature. Therefore, the present epidemiological study has been undertaken to study the childhood obesity among the primary school children in Ludhiana city. These data are extremely important to define the problem and to design proper intervention strategies. Even though, it only provides rough estimates of the prevalence of childhood obesity, but still a remains undetected. However, the study provides a baseline data on the prevalence of childhood overweight and obesity as well as their associated risk factors in the capital city children of Punjab. Therefore, the result of this study might be able to create primary awareness in general population, to cope with the future challenges to prevent childhood overweight and obesity.

2.1GENERAL OBJECTIVE

The general objective of the study is to determine the prevalence of childhood overweight and obesity and its risk factors in primary schoolchildren of Ludhiana city.

2.3SPECIFIC OBJECTIVES

1. To measure height, weight and other anthropometric indices (MAC) in primary school children.
2. To investigate the risk factors of overweight and obesity among in primary school children.
3. To analyze the influence of socioeconomic and demographic factors on the anthropometric indices of the children.
- 4.

III. STUDY DESIGN

The study was a cross-sectional study, which was focused on the prevalence of childhood obesity in primary school children of Ludhiana city in Punjab. This epidemiological survey was conducted to find out the prevalence of childhood overweight and obesity. The study was an epidemiologic study involving primary school children of Ludhiana city. The study population was both children boys and girls aged 6 to 13 years old were included in these study.

Table 1: Demographic and Socio-Economic Characteristics of the Study Subjects (N=1200)

In this cross sectional study a total of 1200 children subjects were attend for the studied. The mean age (years, mean \pm SD) of those participant was 9.68 ± 1.81 among them, 580 (48.3%) was boys and 620 (51.7%) were girl.

Variables		Frequency	Percentage
Mean Age (years), Mean\pm SD		1200	9.68 ± 1.81
Age	6 to 8 years old	355	29.6
	9 to 10 years old	435	36.2
	11 to 12 years old	322	26.8
	>12 years old	88	7.4
Sex	Boys Participant	580	48.3
	Girls Participant	620	51.7
Education	Father		
	>12 years of education	599	49.9
	10-12 years of education	334	27.8
	<10 years of education	267	22.2
	Mother		
	>12 years of education	348	29.0
	10-12 years of education	387	32.2
	<10 years of education	465	38.8
Occupation	Father		
	Service	599	49.9
	Business men	435	36.2
	Others	166	13.8
	Mother		

	Service	152	12.7
	House wife	1011	84.2
	Others	37	3.1
Income (Monthly)	< 8000 thousand BTD/month	186	15.5
	9000-20000 Thousand BTd/month	582	48.5
	21000- 30000 Thousand BTd/month	93	7.8
	> 30000 thousand BTd/month	339	28.2

Results are expressed as mean ± SD and number (%); Abbreviation: BTd, Punjabi taka

All participants were divided in to 4 age group. Among them 355 (29.6%) participant were between 6 to 8 years, 435 (36.2%) participants were 9 to 10 years, 322 (26.8%) participants were 11 to 12 years and 88 (7.4%) were above 12 years old. The level of education 73 (6.1%) of mother and 44 (3.7%) of father were below 6 years, and 599 (49.9%) of father and 348 (29.0%) of mothers were above 12 years of education, 334 (27.8%) of father and 387 (32.2%) of mother were 10 to12 years of education and 233 (18.6%) of fathers and 392 (32.7%) of mother were 6 to 10 years of education. The occupations of mother 1011 (84.2%) were housewife, 599 (49.9%) father were service holder and 152 (12.7%) of mother were service holder and 435 (36.2%) of father were businessman respectively. All participants' monthly income was divided in to 4 categories. Among them 339 (28.2%) were earn above 30 thousand BTd per month, 93 (7.8%) were earn 20 to 30 thousand BTd per month, 582 (48.5%) were 9 to 20 thousand BTd per month and 186 (15.2%) earn below 8 thousand BTd per month.

Table 2: Description of Nutritional status of the children (n= 1200)

Variables	Frequency	Percentage (95% CI)
Under weight (< 90% of standard)	359	29.9 (27.33% - 32.51%)
Normal wt (91-110 % of standard)	469	39.1 (36.32% - 41.84%)
Over weight (111-120% of standard)	159	13.2 (11.33% - 15.17%)
Obese (>120% of standard)	213	17.8 (15.59% - 19.91%)

Results are expressed as number (%) and 95% Confidence Interval (CI).

The Nutritional status of the all study subject was 359 (29.9%) were underweight (<90 % of standard weight), 469 (39.1%) were normal (91-110 % of standard weight), 159 (13.2%) were overweight (111-120 % of standard weight) and 213 (17.8%) were obese (>120 % of standard weight) respectively. (Table: 2).

Table 3: Nutritional status of the Boys (n= 580)

Variables	Frequency	Percentage (95% CI)
Under weight (< 90% of standard weight)	149	25.7 (22.13% - 29.25%)
Normal weight (91-110 % of standard)	224	38.6 (34.66% - 42.58%)
Over weight (111-120% of standard)	79	13.6 (10.83% - 16.41%)
Obese (>120 % of standard weight))	128	22.1 (18.69% - 25.45%)

Results are expressed as number (%) and 95% Confidence Interval (CI).

Table 4: Nutritional status of the Girls (n= 620)

Variables	Frequency	Percentage (95% CI)
Under weight (< 90 % of standard weight)	210	33.9 (30.14% - 37.6%)
Normal weight (91-110 % of standard weight)	245	39.5 (35.67% - 43.37%)
Over weight (111-120% of standard)	80	12.9 (10.26% - 15.54%)
Obese (>120 % of standard weight)	85	13.7 (11% - 16.42%)

Results are expressed as number (%) and 95% Confidence Interval (CI).

The difference of nutritional status of the study (boys and girls) subjects were shown in table 3 and 4. The prevalence of overweight and obesity among boys and girls were 13.6% (95% CI: 10.83 - 16.41), 22.1% (95% CI: 18.69 - 25.45), 12.9% (95% CI: 10.26 - 15.54) and 13.7% (95% CI: 11 - 16.42) respectively. It shows that boys were higher prevalence of overweight and obesity than girls.

Table 7: Nutrients intake of boys according to weight status

category (n= 580)

Results are expressed as median (range). One-way ANOVAs were used for testing difference

Weight status category	CHO intake (g/d)	animal protein intake (g/d)	vegetable protein intake (g/d)	fat intake (g/d)	Iron intake (mg/d)	V-C intake (mg/d)
All (n= 580)	36 8 (179 - 773)	8 (1- 36)	36 (16 - 81)	14 (68 - 2 1 368)	2 0 (0 - 53)	12 3 (7- 549)
underweight (n=149)	36 0 (222 - 710)	7 (2 - 26)	35 (18 - 74)	13 (72 - 2 2 367)	2 0 (11 - 47)	11 4 (7- 538)
normal weight (n= 224)	37 1 (179 - 773)	8 (2 - 28)	36 (16 - 73)	14 (72 - 2 0 368)	2 0 (0 - 50)	13 (14 - 0 549)
over weight (n= 79)	36 2 (207 - 645)	9 (1 - 36)	36 (19 - 81)	15 (71 - 1 0 329)	1 9 (9 - 34)	13 8 (8 - 524)
obese (n=128)	37 6 (196-680)	8 (2- 24)	37 (17 - 76)	14 (68 - 2 9 361)	2 0 (10 - 42)	11 3 (11-521)
P - value	0.393	0.135	0.328	0.021	0.489	0.119

between the four weight groups in boys (Post Hoc Bonferroni).

The average daily intake of various nutrients by boys according to weight status category is shown in the table. The intake of carbohydrate, animal protein, vegetable protein, fat, iron and vitamin C (median value) were 368 (179-773) g /day, 8 (1-36) g/day, 36 (16- 81) g/day, 141 (68-368) mg/day, and 20 (0-53) mg/day, 123 (7-549) mg/day respectively. The daily intake of carbohydrate, animal protein, vegetable protein, fat, iron and vitamin C (median value) in underweight group was 360 (222-710), 7 (2-26), 35 (18-74), 132 (72-367), 20 (11-47), 114 (7-538). In normal group it was found that the daily intake of carbohydrate, animal protein, vegetable protein, fat, iron and vitamin C (median value) were 371 (179-773), 8 (2 -28), 36 (16-73), 140 (72- 368), 20 (0-50), 130 (14 - 549). In overweight and obese group the daily intake of carbohydrate, animal protein, vegetable protein, fat, iron and vitamin C (median value) were 362 (207-645), 9 (1-36), 36 (19-81), 150 (71-329), 19 (9-34), 138 (8-524) and 376 (196-680), 8 (2-24), 37 (17-76), 149 (68-361), 20 (10-42), 113 (11-521) respectively.

IV. MAIN FINDINGS

Childhood obesity has become a serious public health problem because of its strong association with adulthood obesity and the related adverse health consequences. Childhood obesity most likely results from an interaction of nutritional, psychological, familial, and physiological factors. Although there are studies available from India, Pakistan, Thailand, Malaysia, Beirut, China and the UK, no published information is available on the prevalence of childhood obesity in the Punjabi population. The present study was undertaken to explore childhood obesity in upper middle and poor class primary school children in Ludhiana the capital city of Punjab.

This study, is presenting for the first time the prevalence of overweight and obese children in Ludhiana city aged 6 to 13 years. A prevalence of obesity (17.8%) and overweight (13.2%) has been found among this section of children. International literature has portrayed developing countries as having a relatively low prevalence of obesity coexisting with a high prevalence of underweight (53). In contrast, in the upper, middle and poor class children of Ludhiana the prevalence of childhood obesity (17.8%) has been found coexisting with a prevalence of underweight (29.9%). In Beirut, the obesity prevalence of the same socioeconomic class and same age children was found as 26% (20).

V. RECOMMENDATION

In addition to useful experiences and observations made during the field work, the results presented in this study generated several issues that warrant further evaluation. In a society like Punjab, where the resources are already diminutive relative to its population size, the increasing life expectancy and elevated prevalence of diabetes, heart disease, hypertension and many others disease dramatically raise the burden and expenses of the health care system. In order to prevent this burden the community needs to be mobilized. So everybody needs to be aware of the risk factors.

In order to address this issue, before it is too late large-scale cohort studies are needed with a control population. Furthermore, this work gives new information on the prevalence of childhood overweight and obesity in the capital of Punjab. As this is the first report from Punjab concerning obesity in children between 6 to 13 years of age, our results need to be confirmed through studies performed in different regions in Punjab at regular intervals in order to be able to assess the probable rate of increase so that an effective obesity prevention program can be introduced for reducing children's overweight. Additional obesity prevalence surveys should be carried out in different socioeconomic classes in Punjab at regular intervals in order to be able to assess the probable rate of increases childhood obesity. Also, public health intervention should be focused on the control and prevention of obesity in children through an integrated community approach.

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