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## Survey of obesity among various age group girls of Punjab

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### Abstract

Prevalence of obesity has increased substantially in the last two or three decades worldwide. The prevalence statistics shows that obesity pandemic is penetrating even in the developing nations like India. In the present study an attempt has been made to report the prevalence of obesity on the basis of body mass index among school girls of Punjab, total 6000 students were randomly selected (750 in each age group) ranging in age from 10-17 years. Height and weight were measured in all participants and the body mass index (BMI) of each individual was calculated. Body mass index classes were calculated according to the API Growth chart 2015. The observations revealed that the overall prevalence of underweight, healthy weight, overweight and obesity was 6.45%, 64.94%, 14.8% and 13.81% respectively. Overweight and obesity was more prevalent among school girl students.

**Keywords:** Prevalence, Obesity, Body composition, Body mass index.

### 1. Introduction

Obesity represents the most frequent public health problem globally (Moschonis *et al.* 2008)<sup>[9]</sup>. The report by the National Institute of Public Cooperation and Child Development reveals that the most number of obese women in the country are found in Punjab. The report titled 'Women in India 2007' states that Punjab have the highest number of obese women. It is further stated that 37.5 per cent of the women in Punjab are obese. A marked increase in the prevalence of overweight and obesity has been observed in the last few decades, both in adults and children, worldwide (Lobstein *et al.* 2004)<sup>[8]</sup>. A few studies have been conducted on overweight and obesity among children in developing countries like India. Punjab is an economically advanced and physically robust state of India. During the last 50 years, the fast developing economy of Punjab with an agricultural base transformed the whole India from a food deficient to grain surplus nation (Gill 2004)<sup>[5]</sup>. Simultaneously, the Punjabi society witnessed a White revolution in addition to Green one. This resulted in higher per capita availability of milk and milk products. Due to improved economic conditions and availability of nutritious food products, the living conditions and nutritional status of Punjabi population experienced a tremendous upward transformation (PSCST 2005). In this prevailing transitional situation of the state, the increased overweight and obesity prevalence may be expected. Research work of Zhang Y *et al.* (2015)<sup>[14]</sup> was focused on the prevalent trends in overweight and obesity among children and adolescents in Shandong. Childhood overweight and obesity has entered the extensively epidemic stage in this region at present. D. B. Kumah *et al.* (2015)<sup>[3]</sup> The aim was to determine the prevalence of obesity and overweight among students in the Kumasi metropolis. In a descriptive cross-sectional study, 500 students aged 10 to 20 years were examined from two junior high schools selected by multistage sampling technique and three randomly selected senior high schools. Out of the 500 students, 290 (58.00%) were males and 210 (42.00%) were females. The prevalence of underweight, normal weight, overweight, and obesity was 7.40%, 79.60%, 12.20%, and 0.80%, respectively. Cunningham SA *et al.* (2014)<sup>[2]</sup> Among children who became obese between the ages of 5 and 14 years, nearly half had been overweight and 75% had been above the 70th percentile for body-mass index at baseline. Incident obesity between the ages of 5 and 14 years was more likely to have occurred at younger ages, primarily among children who had entered kindergarten overweight. A descriptive cross sectional study conducted by Nkwoka I. J. *et al.* (2014)<sup>[10]</sup> their weight, height, and body mass index were assessed. The prevalence of obesity was found to be 12% while the prevalence of obesity and overweight combined was 47%.

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The respondents who had Knowledge of own weights were 67% and those who had no knowledge of their weights were 33%. Respondents who wanted a better shape than they were 82.4% and those who did not mind their shape were 16.5%. The respondents who perceived Obesity as a sign of good living were 12.5%; as a result of laziness 9.7%; as God-given 9.7%; as a disease 68.1%. (Jonathan C. K. Wells *et al.*, 2012)

[6] The prevalence of overweight and obesity among the school children using the recently published WHO 2007 sex specific body mass index (BMI) for age percentile chart, which is considered to provide an appropriate reference curves for the world population aged 5 – 19 years. This study is the first of its kind in India to report the latest figures using these charts. There is virtually no data from India assessing knowledge and awareness levels of children about healthy lifestyle habits, hence it was also assessed simultaneously. Alice T Cherian *et al.* (2012) The objective of this study was to examine the prevalence of obesity and overweight in urban school children in Kochi, Kerala, South India. Prevalence of obesity and overweight was found to be higher in the high income group and among girls. In India there is paucity of data on the prevalence of childhood obesity which is an emerging health challenge. Therefore we decided to contribute to the data collection by investigating the prevalence of obesity in school girls in various schools in Punjab. This will help us in estimating the local prevalence of this condition and will prepare us for the challenge of introducing primary prevention in this area. Habit formation occurs mainly during this age. So primary interventions targeting this age group has high possibility of yielding good results. This is the reason why we have targeted this age group of 10-17years. Thus the aim of this

research work is to find out the prevalence of obesity among school girls of Punjab

## 2. Material and Methods

Aim of the present study is to determine the prevalence of obesity in Punjab school girls by using API Growth chart standard. For this purpose total 6000 girl students were selected as a sample and the age ranges from 10-17 years (3000 each from government and private schools). The data was obtained from different district schools of Punjab.

### 2.1 Variable and Criterion Measures

#### 2.1.1 Body mass index

Each subject was made to stand bare foot on bio electrical impedance machine with scale HBF-361. The subject's height, age, and gender was manually saved in the machine. System automatically calculate the actual values of Body fat percent, Body Mass Index, Basal Metabolic Rate, Skeletal Muscle percent and displayed the same machine. If the test performed systematically then it was saved otherwise test was repeated again.

#### 2.1.2 Statistical Consideration

SPSS was utilized for interpretation of the data. The results were analyzed statistically by applying Chi-square test.

## 3. Results

Different types of descriptive statistic such as mean and standard deviation was computed to describe each variable statistically. The level of significance was set at .05. Its results have been depicted in the following tables.

**Table 1.1:** Body Mass Index Categories among Various Age Groups of School Girls Crosstabulation

| Group |                | Body Mass Index Categories |                 |              |        | Total  |
|-------|----------------|----------------------------|-----------------|--------------|--------|--------|
|       |                | *Under Weight              | *Healthy Weight | *Over Weight | *Obese |        |
| 10    | Count          | 48                         | 500             | 109          | 93     | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 6.4%                       | 66.7%           | 14.5%        | 12.4%  | 100.0% |
| 11    | Count          | 33                         | 493             | 120          | 104    | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 4.4%                       | 65.7%           | 16.0%        | 13.9%  | 100.0% |
| 12    | Count          | 52                         | 502             | 102          | 94     | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 6.9%                       | 66.9%           | 13.6%        | 12.5%  | 100.0% |
| 13    | Count          | 46                         | 474             | 125          | 105    | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 6.1%                       | 63.2%           | 16.7%        | 14.0%  | 100.0% |
| 14    | Count          | 52                         | 498             | 89           | 111    | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 6.9%                       | 66.4%           | 11.9%        | 14.8%  | 100.0% |
| 15    | Count          | 46                         | 439             | 143          | 122    | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 6.1%                       | 58.5%           | 19.1%        | 16.3%  | 100.0% |
| 16    | Count          | 47                         | 507             | 99           | 97     | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 6.3%                       | 67.6%           | 13.2%        | 12.9%  | 100.0% |
| 17    | Count          | 63                         | 483             | 101          | 103    | 750    |
|       | Expected Count | 48.4                       | 487.0           | 111.0        | 103.6  | 750.0  |
|       | % of Total     | 8.4%                       | 64.4%           | 13.5%        | 13.7%  | 100.0% |
| Total | Count          | 387                        | 3896            | 888          | 829    | 6000   |
|       | Expected Count | 387.0                      | 3896.0          | 888.0        | 829.0  | 6000.0 |
|       | % of Total     | 6.4%                       | 64.9%           | 14.8%        | 13.8%  | 100.0% |

\*API Growth chart 2015.

The table 4.2.26 portray that while the body mass index categories was analysed of total 6000 subjects of various age groups of school girls that the underweight (6.4%), healthy weight (64.9%), overweight (11.3%) & obese (2.6%).

- i. The above results show that the total 750 subjects taken were from 10 years of age group and their body mass index category of underweight (6.4%), healthy weight (66.7%), overweight (14.5%) & obesity (12.4%).
- ii. Whereas in the case of 11 years the total no. of subjects taken were 750 and their body mass index category of underweight (4.4%), healthy weight (65.7%), overweight (16.0%) & obesity (13.9%).
- iii. In the case of 12 years the total no. of subjects taken were 750 and their body mass index category of underweight (6.9%), healthy weight (66.9%), overweight (13.6%) & obesity (12.5%).
- iv. While overall body mass index categories in 13 years the total no. of subjects taken were 750 and their underweight (6.1%), healthy weight (63.2%), overweight (16.7%) & obesity (14.0%).
- v. The total 750 subjects taken were from 14 years of age group and their body mass index category of underweight (6.9%), healthy weight (66.4%), overweight (11.9%) & obesity (14.8%).
- vi. In the case of 15 years the total no. of subjects taken were 750 and their body mass index category of underweight (6.1%), healthy weight (58.5%), overweight (19.1%) & obesity (16.3%).
- vii. Further in the case of 16 years the total no. of subjects taken were 750 and their body mass index category of underweight (6.3%), healthy weight (67.6%), overweight (13.2%) & obesity (12.9%).
- viii. But in the case of 17 years the total no. of subjects taken were 750 and their body mass index category of underweight (8.4%), healthy weight (64.4%), overweight (13.5%) & obesity (13.7%).

**Table 1.2:** Body Mass Index Categories among Various Age Groups of School Girls Chi-Square Tests

|                              | Value               | Df | Asymp. Sig. (2-sided) |
|------------------------------|---------------------|----|-----------------------|
| Pearson Chi-Square           | 42.449 <sup>a</sup> | 21 | .004                  |
| Likelihood Ratio             | 42.259              | 21 | .004                  |
| Linear-by-Linear Association | .002                | 1  | .963                  |
| N of Valid Cases             | 6000                |    |                       |

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 48.38.

Tabulated  $X^2$  value (16.81) at .01 level of significance.

It is evident from table 4.2.27 that the test of body mass index which was computed on 6000 subjects among various age groups of school girls of Punjab that a Chi Square test was performed to determine the prevalence of underweight, healthy weight, overweight and obesity indicated a significant difference,  $X^2 = 42.449^a$ ,  $p = .000$  which is more than  $p > 0.01$ . It means the test results indicate that there is significant difference among various categories of body mass index among various age groups of school girls of Punjab.

#### 4. Discussion of Findings

It is evident from the results of the study that there is significant difference among various age groups of body mass index portray that while the body mass index categories was analysed of total 6000 subjects of various age groups of school girls that the under weight (6.4%), healthy weight (64.9%),

over weight (14.8%) & obese (13.8%). The findings of the current study showed a steady increase in the prevalence of overweight and obesity with age till 15 years of age. The range of age-specific prevalence of overfat/obesity has increased in the early age in comparison to the later age group. Maximum change in percentage prevalence of overweight and obesity was observed at age 16 to 17 years, respectively. The total underfat of school girls increases with the age increases and total % of healthy fat almost constant from 10 to 17 years of age. The outcome may be due to the differences in the lifestyle, mainly in the dietary patterns, and physically activity. The growing use of computers, increased time watching television and decreased physical education in schools, all contribute to children and adolescents living a more sedentary lifestyle. Nowadays children spent more money on food outside home, at restaurants, cafeterias, sporting events, etc. In addition, as portion sizes have increased, when people eat out they tend to eat a larger quantity of food (calories) than when they eat at home. Beverages such as carbonated soft drinks and juice boxes also greatly contribute to the childhood obesity epidemic. These findings are in agreement with other studies in the literature. Among children who became obese between the ages of 5 and 14 years, nearly half had been overweight and 75% had been above the 70<sup>th</sup> percentile for body mass index at baseline (Cunningham SA *et al.* (2014) [2]. Hamed Tabesh *et al.* (2014) [5] conducted a study on "Prevalence of overweight and obesity among school children in the city of Ahvaz" he has also found that the prevalence of overweight and obesity increased markedly with age. These findings are reinforced with Kumar S *et al.* (2007) [7] it has been conducted a study "Among 1496 students studying 5<sup>th</sup> to 10<sup>th</sup> standard of two affluent schools in Davangere, Karnataka" has also found that the prevalence increased with increase in age in both boys and girls. Some studies suggested that the prevalence of obesity decrease significantly with age (Chhatwal J. *et al.* 2004) [1]

#### 5. Conclusion

The study revealed a high prevalence of overweight (14.8%) and obese (13.8%) among the students. Therefore, there is a need to establish effective prevention and health promotion programmes among the students. This would enable maintaining healthy weights and avoiding the possible immediate and long-term health complications associated with overweight and obesity.

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