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OBESITY

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ABSTRACT.. **Objectives:** To assess frequency of obesity among college adolescent male and female students on BMI-Prime bases through anthropometric. **Design:** Cross sectional study. **Setting:** At higher secondary colleges located in urban areas of Bahawalpur City. **Period**: From February 2009 to March 2009 **Materials & Methods**: Assessment of obesity among 400 college male & female students equally divided, ages from 16 to 23 years was carried out on BMI-Prime bases. Weight categories so achieved were stratified and labeled. **Results:** There were 3(0.75%) severely under weight, 44(11%) under weight, 273(68.25%) normal, 68(17%) over weight, 9(2.25%) obese and 3(0.75%) were clinically obese. There was no morbidly obese. No statistical gender difference for severely under weight and clinically obese was noted. However females were more under weight ($p<0.05$) while males were more over weight ($P<0.05$) and obese ($P<0.05$) when compared with each other. **Conclusion:** The adolescent female college students were under weight when compared to their male colleagues. The frequency of obesity was higher among male students

Key words: Obesity, College, Prime, Categories.

INTRODUCTION

Body Mass Index (BMI) is also labeled as Quetelet's Index invented between 1830 to 1850 after name of the Belgian Polymath Adolphe Quetelet working on social physics[1]. BMI –Prime is ratio of actual BMI to upper arbitrary limit of BMI (25 or 23) and is pure dimensionless number without associated unit.

Its benefits are quick comparison and judgment of two populations by rapid calculation. Its limitation is how much data obtained from it is accurate and pertinent. This method falls prey to the obstacle of different muscular and bone density as compared to adipose tissues due to exercise habits specially among athlete[1].

BMI is a value derived after body weight (Kg) divided by square of height in meter (Kg / m^2).

BMI does not measure body fat directly but correlates to direct measures of body fat such as under water weighing and dual energy x-ray absorptiometery[3]. BMI method for obesity assessment can be used even on hospitalized patients for weight reduction advice if not contraindicated[4].

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For South East Asian population, threshold BMI denominator value has been reduced from 25 to 23. However private health insurance providers intentionally change upper arbitrary cut off BMI point to abstain an individual from guarantee of insurance claim admissibility to reduce cost of insurance coverage ostensibly.

Obesity has become national epidemic[5]. Among elderly (>65 Years) incidence of obesity is higher among female than male.[6] Its prevalence is variable from 19.1% to 30.2% from age 18 to 59 years. The wide range of obesity prevalence is attributed to ethnicity , race , sex , genetics, education and socio-economics.

Intensive health education to reduce magnitude of adolescent obesity remained in doldrums in the past due to concrete religious-social constraints. Effective teaching staff training to combat over weight and obesity among college students is now essential[7]

The prevalence of obesity is increasing in both developed and developing countries is associated with increased mortality and morbidity[8] Food eating competitions and enjoying large food intake served in abundance during childhood period also play a role to generate over weight and obese adolescents at college level. Previous literature[9] revealed that 38.5% students were over weight and 11.1% obese.

In addition to it plumpness is labeled as sign of health and wealth while slim and skinny is construed as reflection of poor fiscal status. It acts as brain storming factor among college adolescent students to become obese.[9] It is not a myth but harsh reality that college going adolescents are over conscious also about their body image and strange eating behaviors are rampart among them[10] Intensive computer work and monotonous research keep the students deprived of opportunity for exercise[11]

METHODOLOGY

Setting and duration

Study was conducted at higher secondary colleges located in urban areas for two months from February 2009 to March 2009.

Study Design: It was Cross sectional study.

Sample size

Sample size of 400 college students (half boys and half girls) were taken by non-probability convenient sample method for this study.

Objectives

Assess frequency of obesity among college adolescent male and female students on BMI-Prime bases through anthropometrics.

Inclusion criteria:

Adolescent students enrolled regularly in their institution at higher secondary and graduate classes and apparently healthy were incorporated in this study ranging from 16 to 23 years age.

Exclusion Criteria

Sick, absent and those not giving consent were excluded.

Procedure

After taking official consent from administration stake holders, students were advised to gather in a room in small groups one after the other where height and weight measurement tools were already arranged. Height was measured in centimeters converted to meter^2. Height was measured without shoes. The weight measured directly in kilogram unit to the nearest 100 gm with the subjects in light indoor clothes or under garments, with evacuated pockets and without shoes using a pre-calibrated weight machine.

Date of birth was asked and noted by their recall method to calculate age. Index of adiposity (obesity) used was BMI (weight Kg/ Height meter^2) and BMI-Prime computed by dividing BMI by 25 cut off value to get dimensionless BMI-Prime number. The categories of obesity and under or over weight on BMI- Prime bases were made by stratification of arbitrary cut off values as:-

1. Severely under weight (<0.66)
2. Under weight (0.66 to 0.74)

3. Normal (0.74 to 1.00)
4. Over weight (1.00 to 1.20)
5. Obese (1.200 to 1.40)
6. Clinically Obese (1.40 to 1.60)
7. Morbidly obese (>1.60)

The data collected was computed, condensed, tabulated from data master sheet and analyzed by SPSS-10 where necessary.

RESULTS

A sample of 400 students was studied. It was revealed that mean age and weight were 19.52 years and 56.795 kg respectively while mean height and BMI were found to be 1.6605 meters and 20.177 respectively. Their mean BMI-Prime was 0.8838 as mentioned in Table I.

Generally among all the student, it was revealed that there were 3(0.75%) severely under weight, 44(11%) under weight, 273(68.25%) normal, 68(17%) over weight, 9(2.25%) obese and 3(0.75%) clinically obese as depicted in Table II. There was no student either male or female belonging to morbidly obese category.

On gender stratification taking 200 males and females in each group it revealed that among males, mean BMI 20.666 and BMI-Prime was 0.8988 while among female mean BMI was 19.688 and BMI-Prime was found to be 0.8689. Severely under weight males were 1(0.5%) and females were 2(1%) with insignificant difference ($p>0.05$). However 33(16.5%) females were significantly under weight than that of 11(5.5%) males ($p<0.05$)).

There were 144(72%) normal weight males being significantly higher as compared to 129(64%) females ($p<0.05$)). It was noted that 36(18%) males were over weight as compared to 32(16%) female students ($p<0.05$). Obese males were 6(3%) who were significantly higher as compared to 3(1.5%) obese females ($p<0.05$). However insignificant difference was found between clinically obese males 2(1%) and females to be 1(0.5%) ($p>0.05$) as shown in Table 2. There was no student morbidly obese in both groups.

Table-I. Mean anthropometric values among college students

Gender	Age (yrs)	Weight (Kg)	Height (m)	BMI	BMI- Prime	Total
Male	20.41	62.045	1.716	20.666	0.8988	200
Female	18.63	51.545	1.605	19.688	0.8689	200
Total	19.52	56.795	1.660	20.177	0.8838	400

Table-II. Frequency of obesity among college students on BMI-prime bases

Group Name	Male (n=200)	Female (n=200)	Total (n=400)	2 SE
Severely under weight	1(0.5%)	2(1%)	3(0.75%)	1.4106*
Under weight	11(5.5%)	33(16.5%)	44(11%)	6.1603**
Normal	144(72%)	129(64.5%)	273(68.25%)	6.808**
Over Weight	36(18%)	32(16%)	68(17%)	7.509**
Obese	6(3%)	3(1.5%)	9(2.25%)	2.962**
Clinically Obese	2(1%)	1(.5%)	3(0.75%	1.724*
Morbidly Obese	-	-	-	-

** p> 0.05 **p<0.05*

DISCUSSION

Body Mass Index is commonly used all over the world for assessment of weight variation. Now BMI-Prime has been introduced which was used in this study. College students both male and female were studied to estimate frequency of obesity and over weight among them.

There mean BMI was 20.177 which is concordant with a study conducted earlier[13]. It has been revealed that there were 17% over weight and 2.25% obese. These findings are less than that of 38.5% and 11.1% over weight and obese respectively mentioned in the previous studies[9,10]. The difference can be explained on bases of economic status which is different among students in different studies.

Our study revealed 16% over weight female students, which is less than that of males. It is concordant with findings depicted in earlier literature[14]. Similarly our finding of 1.5% obese female students is much less than 6.9% quoted in previous study by Ahmad and Numan M[12]. It may be attributed to body figure conscious trends among young college female students to prevent their social rejection as quoted by Thamus F[15] also.

However study conducted by Swami HM and Bhatia V[8] quoted females to be more over weight/ obese than males, which is contradictory to our finding. The difference mentioned above may be attributed to familial and social characteristics widely varied among populations included in different studies.

It has been found that over weight and obese males were 18% and 3% respectively, which are higher ratios when compared to 16% and 3% among female students. It is similar to findings quoted by two other studies conducted earlier[16,17]. It may be because of social concept taking fatty male as a rich and thin as a poor, mentioned in previous literature[9]. This social perception may act as induction factor in male college students to become over weight. Volicer et al [18] also described concept of male college students considering over weight as sign of excellent health rather than a problem. It increases prevalence of obesity & over weight among male college students.

CONCLUSION

The adolescent female college students were under weight when compare to their male colleagues. The frequency of obesity was higher among male students. It requires normal weight awareness among adolescent college students.

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