

A STUDY ON PREVALENCE OF OBESITY AMONG COLLEGE GOING GIRLS IN AGRA DISTRICT OF U. P.

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ABSTRACT:

Research question: What is the prevalence of obesity among urban college going girls of Agra in the age group of 18-24 years?

Objectives:

1. To study the anthropometric characteristics of study subjects.
2. To study the magnitude of obesity among them.
3. To compare the prevalence of obesity by WHO & Revised Indian Guidelines

Study design: Cross sectional study.

Setting and participants: Non professional colleges of Agra city and college going girls of 18-24 years.

Study period: July to December 2008.

Sample size: 400 college going girls of 18-24 years.

Study variable: Height, Weight, Waist circumference, Hip circumference.

Results: According to WHO, 2000 guideline, the prevalence of overweight and obesity was 18.5% and 4.5% respectively. 45.5% of the subjects had normal weight and 31.5% were underweight. According to revised Indian guideline, surprisingly, 42.5% were classified as overweight/obese amongst which 23% were obese with remaining 19.5% overweight and 57.5% of subjects were either classified as normal (26%) or below normal (31.5%).

Conclusion: Higher prevalence of obesity especially by Indian guidelines, calls for the prevention and control of this problem with prime attention.

Introduction:

Obesity is often defined simply as a condition of abnormal or excessive fat accumulation in adipose tissue to the extent that health may be impaired. Once considered a problem related to affluence, obesity is now fast growing in many developing countries. Even in countries like India, which is multi-ethnic having multi socio-economic levels, is typically known for high prevalence of under nutrition; significant proportions of overweight and obese now coexist with the undernourished.⁽¹⁾

Paradoxically coexisting with under nutrition in developing countries, the increasing prevalence of overweight and obesity is associated with many diet-related chronic diseases including diabetes mellitus, cardiovascular disease, stroke, hypertension and certain cancers. The great prevalence of this condition, its severe consequences for physical and mental health and the difficulty of treating it make the prevention of obesity a major public health priority.

Considering all these points, the present research work has been carried out with the following objectives to throw a limelight on the prevalence of obesity that could be pursued to help urban college going girls more appropriately achieve and maintain a healthy body weight.

Objectives:

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3. To compare the prevalence of obesity by WHO & Revised Indian Guidelines.

Material and methods:

The list of colleges was obtained from Agra University. There were 12 degree colleges in urban Agra among which 6 were non-professional. All these six colleges were selected for the study purpose from the list. Around 70 subjects within the age range of 18-24 years were included from each of these colleges to complete the sample size.

Subjects were studied from each of these colleges randomly whoever present at the time of visits to colleges till the sample size was completed. Each girl was interviewed personally to collect the required information on pretested schedule. All experiments were performed in accordance with relevant guidelines and regulations and informed verbal consent and cooperation was sought from all subjects prior to their participation in the study. The research described was compliant with basic ethical standards.

Anthropometrical measurements:

For the assessment of overweight and obesity, anthropometrical measurements were taken using standard

apparatus with the subjects wearing light clothing and without shoes. Weight was measured in the upright position with a weighing scale to the nearest 0.1 kilogram (kg). Each day the scale was calibrated with a standard weight. Height was measured to the nearest 0.5 cm. Waist and hip circumferences were measured by using non-flexible tape to an accuracy of 0.1 cm. Waist was measured horizontally at the level just above the uppermost border of the iliac crest at a normal minimal respiration. Hip was measured as the maximum circumference over the buttocks. Body mass index (BMI) was calculated as weight (kg) divided by height squared (m²)

to estimate overall body fat distribution and was classified into four categories according to WHO,2000 criteria⁽²⁾ and revised Indian guideline, 2008⁽³⁾(Table 2 & 3).

Statistical methods :

The database so prepared was analyzed with the help of statistical program available in SPSS version 16.0(Statistical package for social sciences) which is among the most widely used programs for statistical analysis in social science. The parameters taken were analyzed statistically to find out the mean, standard deviation and range for the anthropometric measurements.

Table 1
ANTHROPOMETRIC CHARACTERISTICS OF STUDIED SUBJECTS

Variables	Mean	S. D.	Range
Age (y)	20.71	±1.588	18-24
Height (m)	1.57	±0.072	1.40-1.76
Weight (kg)	53.51	±8.35	36-81
Waist circumference(inch)	29.39	±2.984	23-38
Hip circumference(inch)	36.34	±3.372	29-47

Anthropometric characteristics of the subjects are shown in the above table. The mean age of the study subjects was 20.71 years with a range from 18-24 years. The mean height of the participants was 1.57m±0.072 ranging from 1.40-1.76. The mean weight was 53.5kg±8.35, though it ranged widely from 36kg to 81kg. The mean waist circumference was 29.39 inches±2.984. It ranged from 23-38 inches. The subjects had a mean hip circumference of 36.34±3.372 with a range from 29-47 inches.

Table 2
CLASSIFICATION OF COLLEGE GOING GIRLS ACCORDING TO BODY MASS INDEX (WHO, 2000)

Classification	BMI cut-off points (kg/m ²)	No. of subjects	% prevalence
Underweight	<18.50	126	31.5
Normal	18.50-24.99	182	45.5
Overweight	=25.00		
Pre -obese	25.00-29.99	74	18.5
Obese class-I	30.00-34.99	18	4.5
Obese class-II	35.00-39.99	--	--
Obese class-III	=40.0	--	--
Total		400	100

Using these cut-off points, the findings revealed that 23% of the subjects were either overweight (18.5%) or obese (4.5%), only 45.5% were having normal BMI and 31.5% had below normal BMI. All who were obese (4.5%), fell into category of obese class I, there were none in obese class II & III.

Table 3
CLASSIFICATION OF COLLEGE GOING GIRLS ACCORDING TO REVISED INDIAN GUIDELINES
(UNION HEALTH MINISTRY OF INDIA, 2008)

Classification	BMI cut-off points (kg/m ²)	No. of subjects	% prevalence
Underweight	<18.5	126	31.5
Normal	18.50-22.9	104	26
Overweight	23.0-24.9	78	19.5
Obese	≤ 25.0	92	23
Total		400	100

Alarmed by Indian scenario of Diabetes, Union Health Ministry of India along with other 20 organizations has proposed a revised guideline for obesity, by reducing the cut-off points for early detection of overweight and obesity, which is in process for finalization. According to these guideline, surprisingly, 42.5% were classified as overweight/obese amongst which 23% were obese with remaining 19.5% overweight and 57.5% of subjects were either classified as normal (26%) or below normal (31.5%).

Discussion :

The present study reported mean age, weight & height 20.71years±1.6, 53.5kg±8.3 & 157.0cm±7.2 respectively. Bellisle F et al. (1995)⁽⁴⁾ reported almost similar mean age but relatively higher mean weight and height of university students in Europe as compared to our study. The difference is due to the fact that their study was conducted among both male & female university students against the only female participants of our study, also in the different demographic and socio-economic environments. Shamail Zafar et al. (2007)⁽⁵⁾ also reported relatively higher mean weight, height & waist circumference however, almost similar hip circumference as compared to our study. This is due to again the fact that the former one has included male participants as well and has been conducted in a different milieu. J. Singh et al. (1999)⁽⁶⁾ reported relatively lower mean height and weight of urban adolescent girls of slums in Lucknow in their study as compared to ours. The study quoted was conducted almost ten years back; overall development during past decade might be the reason. Our study reported a mean weight of 53.51%±8.35 which is in concordance with the similar study conducted by Augustine & Poojara(2003)⁽⁷⁾ among urban college going girls of Ernakulam. This finding of the present study is also very close to Indian reference women weight as per ICMR standards.⁽⁸⁾ The mean waist circumference in the present study was 29.39 inches±2.984 which is below the cut-off point for obesity (under the guidelines of the International Diabetes Federation, a normal waist line for a woman is 32 inches or less). Li C et al. (2004) reported a relatively higher mean waist circumference for girls (18-19 years) in US of 33.5 inches, the difference from our study is due to the fact that their study was conducted in a different socioeconomic environment with a difference in lifestyle and food habits. Study conducted by NIN, Hyderabad (2005)⁽⁹⁾ among adolescent girls of Andhra Pradesh reported a slightly lower mean hip circumference (HC) as compared to our study. This can be due to the fact that their study was conducted among

adolescents of 12-17 years age.

According to World Health Organization (WHO, 2000), body mass index (BMI) provides the most useful, albeit crude, population level measure of obesity, and it can be used to estimate the prevalence of overweight/obesity within a population and the risks associated with it. According to this criteria, the present study shows that nearly one fourth (23%) of girls were either overweight (18.5%) or obese (4.5%) while only close to half (45.5%) of the study population were having a normal BMI and slightly less than one third (31.5%) of them were under weight. The study thus also exposed the fact that under nutrition is still prevailing in the state along with rise in over nutrition. The socioeconomic development of recent decades in Agra has generated a neo middle class, both at the rural and urban level which may be responsible for rise in prevalence of overweight. The study done by Sharda Sidhu and Prabhjot(2002)⁽¹⁰⁾ have reported a higher prevalence of overweight and obesity of 28.2% & 15% respectively among college girls of more than 18 years of age in Punjab as compared to our study. The higher prevalence of obesity/overweight may be because the study was done in a economically more developed state. Also the difference in culture and food habits in Punjab might be responsible for it. Study conducted by M. Mehta et al. (2002)⁽¹¹⁾ among affluent adolescent girls of New Delhi found relatively higher and lower prevalence of obesity & overweight respectively than the present study. The higher prevalence of obesity in their study could be because the study was done among affluent societies which are transitioning to westernized lifestyles and probably experiencing an obesogenic environment. The lower prevalence of overweight as compared to our study can be attributed to the age group of the subjects (16-17 years). The findings of study conducted by Augustine and Poojara (2003)⁽⁷⁾ on urban college going girls of Ernakulam also showed the higher prevalence of overweight and obesity of 24% & 10.5% respectively, the difference from our results is due to different criteria(WHO Regional Report,2000) used to

determine the weight category status in their study. National Family Health Survey (NFHS-3, 2005-06)⁽¹²⁾ showed 2.8% obese women with BMI 30 or more and 12.6% overweight with BMI 25-30 among both urban and rural Indian female population which is quite lower than the present study reason obviously is different age group & women of all walks of life were included in NFHS. Similar study conducted by Priyanka Tiwari and Aarti Sankhala(2007)⁽¹³⁾ had given the nearly same prevalence of obesity of 4.4% among college going girls of Udaipur as ours.

In Asian subjects, the risk associated with diabetes and cardiovascular diseases occurs at lower levels of BMI. This is attributed to body fat distribution; Asian Indians tend to have more visceral adipose tissue, causing higher insulin resistance, despite having lean BMI. Wang J et al. (1994) have proved this by his study.⁽¹⁴⁾ In that context, Lower BMI cut-points have been suggested to evaluate overweight and obesity specifically for Asian populations by WHO Expert Consultation (Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004). The Union Health Ministry of India in association with the Diabetes Foundation of India, the All-India Institute of Medical Science (AIIMS), Indian Council of Medical Research, the National Institute of Nutrition and 20 other health organizations has released new guidelines (India reworks obesity guidelines, makes fitness norms tighter, The Hindu, 25 November 2008)⁽³⁾ for prevention and management of obesity and metabolic syndrome which was earlier proposed by WHO in 2000. If these criteria are taken into account as against WHO proposed criteria, nearly half of the subjects (42.5%) would be classified as either obese (23%) or overweight (19.5%).

The study conducted by Augustine and Poojara (2003)⁽⁷⁾ had also explored relatively higher prevalence of overweight but lower obesity, 24% and 10.5% respectively among college going girls of Ernakulam by using the similar cut-off points of overweight & obesity for Asia Pacific inhabitants suggested earlier by WHO Regional report, 2000. Study conducted by Priyanka Tiwari and Aarti Sankhala(2007)⁽¹³⁾ had revealed quite lower prevalence of overweight & obesity of 5.6% & 4.4% respectively among college going girls of Udaipur by using similar BMI cut off points suggested by WHO, 2000 for Asia Pacific inhabitants. The differences in the prevalence of these studies from the present study may be attributed to different socio cultural environment along with diverse regional food habits.

Conclusion :

The overall prevalence of overweight and obesity among college going girls was about 18.5% and 4.5% respectively by WHO, 2000 criteria. The prevalence of obesity was noted as high as 23% according to revised Indian guidelines. The prevention and control of this problem must, therefore, claim prior attention. Weight is usually positively related to increased morbidity and mortality whereas height is often

associated with good health. Therefore, among obese subjects, the BMI have reflected the negative effects of both fatness and shortness in our study.

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