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ORIGINAL ARTICLE

BODY MASS INDEX AND ITS ASSOCIATED FACTORS IN YOUNG MEDICAL STUDENTS

SHEIKH N.H., HAIDER A., KHAN F.F., KHAN F.S. AND HUMAYUN A.
Department of Community Medicine, Obstetric and Gynaecology and Radiology, Akhtar Saeed Medical and Dental College, and Shaikh Khalifa Bin Zayed Al-Nahyan Medical College, Lahore, Pakistan

ABSTRACT

Objective: To identify factors associated with Body Mass Index (BMI) of young adults in a medical school.

Methodology: A descriptive cross – sectional study was conducted among students of Akhtar Saeed Medical Dental College Lahore, Pakistan from Jan. 2012 to July 2012. A representative sample of 103 regular medical students was randomly selected. Their heights and weights were recorded and structured questionnaire was filled after taking consent for interview on dietary habits, intake of breakfast and fast food, physical activity, exercise, family history and mood swings. The data was entered and analyzed on SPSS vs. 20. BMI was calculated, and relationship of BMI with different factors was assessed by using chi-square test.

Results: Out of total 103 students, 57 (55.3%) were females. The mean age was 20.27 ± 1.292 years. Ninty seven students (94.2%) belongs to the family having income / capita / month ≥ than Rs. 10,000 and only 2 (1.9%) families were having illiterate parents. Family history of obesity was positive among 25 (24.3%) students. Fifty one (49.5%) students were hostilites. Total 58 (56.3%) had BMI ≥ 25 and among them 28 (27.18%) were males and 30 (29.12%) were females (p = 0.402). only 8 males and 4 females were obese having BMI ≥ (p = 0.103) this difference was insignificant. The difference in BMI among those who used to take exercise and those who didn't take exercise was significant (p = 0.038). Association of Income / capita / month was found insignificant in overweight (p = 0.242) and obesity (p = 0.359). Fast food consumption and mood swings were also found insignificant as young adults are more concerned about their figure (p = 0.49 and p = 0.88 respectively).

Conclusion: The problem of overweight and obesity was quite high. Obese males and overweight females students were more. It is an alarming situation and attention must be given to address it by creating awareness and health education among young adults.

Keywords: Obesity, overweight, Body Mass Index, predictors of Body Mass Index.

INTRODUCTION

To epidemic of obesity is creating an alarming situation globally.[1] Burden of non-communicable diseases in general and cardiovascular disease (CVD) in particular is largely attributed to obesity both in developed as well as in developing countries. National, regional, and global trends in body – mass index since 1980 was observed along with systematic analysis of health examination surveys and epidemiological studies with 960 country – years and 9.1 million subjects were participated in it.[2,3] Obesity is a major public health concern globally. Striking changes in rates within countries over time and among migrating populations were found indicating diet and lifestyle as primary determinants of these diseases over genetic predisposition. Thus, worldwide considerable research is focusing on identifying modifiable determinants of chronic diseases.[4] Atherosclerosis and its complications are developed throughout life due to influences of lifestyle factors, environmental triggers, and genetic susceptibility resulting in obesity and its associated chronic diseases.[8] Worldwide obesity has nearly doubled since 1980. In 1997, the WHO formally recognized obesity as a global epidemic. As of 2005 the WHO estimates showed that at least 400 million adults i.e 9.8% are obese, with high rates among women than men. In 2008; more than 1.4 billion adults of age 20 or older were overweight. Of these over 200 million men and nearly 300 million women were obese. Overweight and obesity are the fifth leading risk for global deaths.

At least 2.8 million adults die each year as a result of being overweight and obese. The prevalence of overweight and obesity in EMRO countries (Bahrain, Egypt Jordan, UAE, Saudi Arabia, Kuwait) ranges from 74%

Corresponding author: [1]Professor Naheed Humayun Sheikh, MBBS, FCPS, PhD (Fellow), Head, Department of Community Medicine, Akhtar Saeed Medical and Dental College, Lahore, Pakistan. 009203214343069, thsnhs@hotmail.com

to 86% in women and 69% to 77% in men.[6]

Overweight and Obesity are defined as abnormal or excessive fat accumulation that may impair health. Body Mass Index (BMI) is a simple index of weight for height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of height in meters (Kg/m^2).[6] If it is ≤ 18.5 person is Under weight while optimal BMI is 18.5 to 25, over weight is 25 to 30, obese class I (moderately obese) 30 to 35, obese class II (severely obese) 35 to 40 and obese class III (very severely obese) is above 40.

According to WHO a person with BMI ≥ 25 is considered as Overweight and a person with a BMI ≥ 30 is generally considered as Obese. These people are at risk of Hypertension, Coronary heart diseases, Diabetes Mellitus type – II and many other diseases. However the problem of overweight and obesity can be overcome simply by creating awareness and educating masses.

In Pakistan, a research conducted showed that 26% women and 19% men were obese.[7] Although obesity has genetic predisposition but role of diet especially dietary fats and physical activity are major contributors. In a study on physical activity and dietary fat intake a significant inverse association was registered between BMI and duration in minutes spent in doing moderate intense physical activity per day (P < 0.01). The study concluded that physical activity predicted BMI and dietary fat was not significant (P > 0.05).[8]

Change in fat intake influences BMI and change in physical activity was inversely associated with change in BMI in women (p = .02). The effect of breakfast type on total daily energy intake and body mass index in a study showed that subjects who ate cereals or cooked bread for breakfast had significantly lower BMI compared to skippers and meat and egg eaters (P = 0.01).[10]

These figures are very significant and alarming as simply increasing physical activity and decreasing dietary fat intake and fast food can help to restore normal BMI. Stressful states especially in young adults can lead to increased BMI. Emotional eating, rather than lifestyle behaviour, drives weight gain in a prospective study in 1562 employees.[7]

As obesity is an emerging global epidemic and upper social class is more prone to obesity that is why young medical graduates are included in this study to find out factors related to deviation in BMI in young adults.

Table 1: *Relationship of demographic and life style factors with obesity (n = 103).*

Variables	*Obesity*			
Gender	*< 30*	*≥ 30*	*%*	*P value*
M	38 (41.7%)	8 (66.6%)	46 (44.7)	0.1
F	53 (58.2%)	4 (33.3%)	57 (55.3)	
	91 (88)	12 (11.7%		
Hostelite				
Yes	45 (49.4%)	6 (50.0%)	51 (49.5)	0.97
No	46 (50.5%)	6 (50.0%)	52 (50.5)	
Meals Per Day				
< 3	43 (47.2%)	6 (50.0%)	49 (47.6)	0.85
≥ 3	48 (52.7%)	6 (50.0%)	54 (52.4)	
Age				
< 20.27	53 (58.2%)	6 (50.0%)	59 (57.3%)	0.58
≥ 20.27	38 (41.7%)	6 (50.0%)	44 (42.7%)	
Year of Education				
< 2 years	54 (59.3%)	7 (58.3%)	61 (59%)	0.94
> 2 years	37 (40.6%)	5 (41.6%)	42 (41%)	
Break Fast Regular				
Yes	34 (37.3%)	5 (41.6%)	39 (37.9)	0.77
No	57 (62.6%)	7 (58.3%)	64 (62.1)	
Take Exercnse				
Yes	47 (51.6%)	10 (83.3%)	57 (55.3)	0.03
No	44 (48.3%)	2 (16.6%)	46 (44.7)	
Obesity Family				
Yes	20 (21.9%)	5 (41.6%)	25 (24.3)	0.13
No	71 (78.0%)	7 (58.7%)	78 (75.7)	
Income / Cap. / Month				
≤ 10000	6 (6.5%)	0 (0.0%)	6 (5.8)	0.35
> 10000	85 (93.4%)	12 (100.0%)	97 (94.2)	
Mood Wings				
Yes	51 (56.0%)	7 (58.3%)	58 (56.3)	0.88
No	40 (43.9%)	5 (41.6%)	45 (43.7)	
Fast Food				
Yes	69 (75.8%)	8 (66.6%)	77 (74.8)	0.49
No	22 (24.1%)	4 (33.3%)	26 (25.2)	

METHODOLOGY

A descriptive cross sectional study was conducted in a private medical college, Akhtar Saeed Medical and Dental College, Bahria Town, Lahore from Jan. 2007 to June, 2012. Total 103 randomly selected students of the first, second, third and fourth year M.B.B.S classes were included in the study. Inclusion criteria were all regular male and female students. Their heights and weights were recorded and structured questionnaire was filled after getting consent, regarding dietary habits, intake of breakfast and fast food, physical activity, exercise and moods swings. All the data was entered and analyzed on SPSS vs. 20. The BMI was calculated, and relationship of BMI with different factors was established by using Chi Square test and Fisher Exact test.

RESULTS

Out of total 103 students, 57 (55.3%) were females. The mean age was 20.27 ± 1.292 years. In this study, 97 students (94.2%) belong to upper social class with income per capita / month more than Rs. 10,000. Regarding educational status of families only 2 (1.9%) families were showing illiterate father and mother and 65 (63.1%) of the fathers were post graduate and 41 (39.8%) of the mothers were post graduates. At the time of study 51 (49.5%) students were hostilites and 42 (40.8%) had completed two years of education in the institution. Family history of obesity was positive among 25 (24.3%) students. Regarding dietary habits 54 (52.4%) were taking 3 or more meals / day and 39 (37.9%) were taking breakfast regularly, 77 (74.8%) were eating fast food more than 3 time/week. Fifty seven (55.3%) were taking exercise regularly 58 (56.3%) students showed eating due to mood fluctuations.

DISCUSSION

Young adult population in every nation is an integral part of socioeconomic development and country's prosperity, so they should be healthy and fit. Overweight and obesity is a risk factor in causation of chronic non communicable diseases therefore increasing the burden of disease.

This study determines factors responsible for deviation in BMI, to overcome the emerging public health issue by creating awareness and health education.

Out of 103 students, 58 (56.3%) had BMI ≥ 25 and among them 28 were males (27.18%) and 30 were females (29.12%) and considering BMI ≥ 30 there are 8 males and 4 females who are obese, in contrast to Pakistan's national figures i.e 26% among females and 19% males. The

Table 2: *Relationship of demographic and life style factors with overweight (n = 103).*

Variables	*Overweight*			
Gender	*< 25*	*≥ 25*	*%*	*P value*
M	18 (40.0%)	28 (48.2%)	46 (44.6)	0.4
F	27 (60.0%)	30 (51.7%)	57 (55.3)	
	45 (43.7%)	58 (56.3%)		
Hostelite				
Yes	26 (57.7%)	25 (43.1%)	51 (49.5)	0.14
No	19 (42.2%)	33 (56.8%)	52 (50.4)	
Meals Per Day				
< 3	24 (53.3%)	25 (43.1%)	49 (47.5)	0.3
≥ 3	21 (46.6%)	33 (56.8%)	54 (52.4)	
Age				
< 20.27	26 (57.7%)	33 (56.8%)	59 (57.2)	0.92
≥ 20.27	19 (42.2%)	25 (43.1%)	44 (42.7)	
Year of Education				
< 2 years	29 (64.4%)	32 (55.1%)	61 (59.2)	0.34
> 2 years	16 (35.5%)	26 (44.8%)	42 (40.7)	
Break Fast Regular				
Yes	16 (35.5%)	23 (39.6%)	39 (37.8)	0.67
No	29 (64.4%)	35 (60.3%)	64 (62.1)	
Take Exercnse				
Yes	25 (55.5%)	32 (55.1%)	57 (55.3)	0.96
No	20 (44.4%)	26 (44.8%)	46 (44.6)	
Obesity Family				
Yes	8 (17.7%)	17 (29.3%)	25 (24.2)	0.17
No	37 (82.2%)	41 (70.6%)	78 (75.7)	
Income / Cap. / Month				
≤ 10000	4 (8.8%)	2 (3.4%)	6 (5.82)	0.24
> 10000	41 (91.1%)	56 (96.5%)	97 (94.1)	
Mood Wings				
Yes	25 (55.5%)	33 (56.8%)	58 (56.3)	0.89
No	20 (44.4%)	25 (43.1%)	45 (43.6)	
Fast Food				
Yes	34 (75.5%)	43 (74.1%)	77 (74.7)	0.87
No	11 (24.4%)	15 (25.8%)	26 (25.2)	

present study revealed that obese females are less as compared to males which showed that young females are more motivated and cautions about their appearance. These findings are not supported by another study carried out by Guo S.S. who by keeping probability of obesity in young adult at 85th percentile studied it and stated that for young males the probability was less than twenty percent while for young females 20 – 39.9%.[11]

Out of total, 25 families (24.3%) had positive family history of obesity, only 5 students belong to these families had BMI ≥ 30 and 17 had BMI ≥ 25.

Those, 57 students who were taking exercise regularly only 10 had BMI ≥ 30, and 32 students showed BMI ≥ 25. The difference in BMI of those who take exercise is significant with those who don't take exercise (P value = 0.030).

Regarding meals / day, in this study 54 students (52.4%) were taking meals 3 or more then 3 times / day. In young adults dietary habits did not show any significant relationship. Out of 54 students 33 had BMI ≥ 25 (61.11%).

In another study on physical activity and dietary fat intake a significant inverse association was registered between BMI and duration of moderate to intense physical activity per day. This study concluded that physical activity predicted BMI and dietary fat was not significant (p = 0.0001).[8]

A study conducted on Chinese adult males concluded that change in fat intake was positively associated with changes in BMI in men, and change in physical activity was inversely associated with change in BMI in women. The effect of breakfast type on total daily energy intake and body mass index in a study showed that subjects who ate cereals or cooked bread for breakfast had significantly lower BMI compared to skippers and meat and egg eaters.[10]

Fast food consumption and mood swings were found insignificant (p = 0.49 and p = 0.88 respectively) in a study conducted in United States comparing adult males and females for BMI and FMD (frequent mental distress). FMD is 1.4 times more among females as compared to males. unadjusted O.R for obesity and FMD was 1.62.[12]

This study ***concluded*** that in a high socioeconomic class, frequency of overweight is (56.3%) and frequency of obesity is (11.6%). This study also showed that physical activity in the form of exercise do play a significant role in lowering BMI.

RECOMMENDATIONS

1. Health education sessions regarding hazards of overweight and obesity should be conducted at regular intervals, (at least quarterly in a year) in the college.
2. Each student should be awared of his, her BMI which will guide them to improve their appearances.
3. Sports and physical activity should be encouraged among medical students.
4. Annual sports week should be organized as healthy competition among young adults improves their performance in each field.
5. Parents should be encouraged to serve home cooked food to children, encourage them for regular breakfast habits and avoid fast food.
6. Regular exercise removes stress, so life style modification right from early child hood is encouraged.

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