SHORT COMMUNICATION

Gender differences in weight status and misperception patterns among university students: A cross sectional study

Samina Rafique,[1] Zainab Waseem,[2] Fatima Sheerin[3]

Abstract

Perceived body weight is a better predictor of weight management behaviour than actual weight of a person. We conducted a cross sectional study to examine the prevalence of weight status and investigate gender difference between actual and perceived body weight among the students of Bahaudin Zakariya University, Multan Pakistan. Data was collected from 475 students. Height and weight were measured and weight status defined according to WHO criterion for Asian populations. Weight perception was assessed by short interviews. Chi square test was used to analyze difference by gender and through various BMI groups.

Incidence of underweight, overweight and obesity remained 11.3%, 14.6% and 14% among boys and 24.6%, 11.3% and 14.15% among girls respectively (P <0.001). About one third (31.7%) of the participants misclassified themselves. The most accurate estimation (76.9%) was encountered in overweight. (P value= 0.00001). Measured weight status and weight perception differed significantly between male and female students (P <0.05).

Keywords: Weight status, weight perception, underweight, overweight, prevalence.

Introduction

Body weight and its perception is an imperative characteristic of health and play a critical role in physical and mental well-being of the individual. World Health Organization (WHO) classifies weight status through body mass index (BMI) which is calculated as weight in kilograms divided by height in meter squares (kg/m^2). A BMI <18.5 is considered underweight while new recommendations for the Asia-Pacific population suggest that a value >23 be used for overweight and > 25 for obesity. Values between 18.5 and 23 are considered normal.[1]

The majority of the studies from the developed world show a high incidence of obesity in young adults such as 47% in USA[2] and 25% in UK.[3] Some Asian countries as Malaysia also show similar trends, where 33.6% of adult population was found to be overweight.[4]

In Pakistan, few studies are available to establish the prevalence of weight status. One study of 284 schoolchildren in Karachi found that 52% were underweight.[5] On the other hand, some recent studies show an increased incidence of overweight and obesity among Pakistani population.[6] Hence, at present, Pakistan is facing the double burden of malnutrition as obesity and thinness coexist. In a developing country like Pakistan, it is important to address the issue to decrease the burden of disease.

Regardless of true weight status, weight perception is the main determinant of dietary habits of a person. Aberrant weight perception can have serious implications. The perception of being obese is a key factor in adolescent's decision to attempt weight loss and such persons are at risk for eating disorders such as anorexia nervosa.[7] Conversely, heavy individuals, taking themselves as normal, are unlikely to control diet or start physical exercise.[8]

Many health hazards are known to be related with obesity such as cardiovascular disease, type 2 diabetes mellitus, cancer and even death.[9] Similarly, underweight is also identified to be associated with increased risk of morbidity and mortality[10] so it is important to study the behaviours of people leading to abnormal body mass index. The present study was planned to estimate the prevalence of under weight and over weight among the students of Bahauddin Zakariya University, Multan and to examine the misperception patterns among male and female contributors of the study.

Methods

This cross sectional study was carried out from 16th to 31st January 2017. Sample size was calculated by taking in account the total number of students at the campus (about 20000). The level of significance (a=0.05) and bound of error was 5%. The percentage of occurrence of overweight was supposed to be 50%. Estimated sample

[1]Bahauddin Zakariya University, [2,3]Nishtar Medical College and Hospital, Multan.

Correspondence: Samina Rafique. Email: saminawasim@hotmail.co.uk

size for the proportion of 50% and Confidence level of 95% was calculated to be 377. In order to avoid non response we took 30% more respondents thus the sample size was grown to 490. This was equally distributed between the seven departments which permitted us to collect the data. Convenience sampling method was used to recruit the students. A total of seventy students were chosen with 50 girls and 25 boys from each of the seven disciplines as female students out number males in the University by 65-70%.

Healthy young adults were included in the study and those having physical disability or chronic disease were excluded. Verbal consent was sought from every participant and a short interview was conducted regarding views about one's own weight before proceeding to actual measurements. We assessed weight perception with one question, "How do you describe your body weight?" Response options included underweight, slightly underweight, normal, slightly overweight, and overweight. These five responses were collapsed into three; underweight, normal and overweight in the analysis. Students were also asked whether they were satisfied with their present weight or want to loose or gain. Weight and height were then computed and body mass index calculated as weight in kg divided by height in meter squares. The students were grouped according to level of BMI as under weight (<18.5), normal (18.5-22.9) over weight (23-24.9) and obese (?25) as per WHO criteria of obesity for Asian population, already mentioned.[1] For analytical purposes overweight and obese were kept in one group. Mean values and standard deviation for all continuous variables: weight, height and BMI for all groups were calculated. Chi-square test was used to analyze the difference by gender and by level of BMI. Frequencies for misperception were calculated for each group as well.

This study was approved by the research committee Bahaudin Zakariya University, Multan

Results

A total 488 students participated in the study. Thirteen students were on medication for chronic diseases such as bronchial asthma and diabetes mellitus; hence they were excluded from the study. We ended up with full

Table-1: Measured and perceived weight status of male and female university students.

	Male		Female		Total		
	N	%	N	%	N	%	P value
Measured BMI							
Normal	90	(60)	162	(49.8)	252	(53)	0.008
Under weight	17	(11.3)	80	(24.6)	97	(20.4)	
Overweight	22	(14.6%)	37	(11.3)	59	(12.4)	
Obese	21	(14%)	46	(14.15)	67	(14)	
Perceived BMI							
Normal	71	(47%)	169	(52%)	240	(50.5%)	0.04
Under weight	44	(29%)	63	(19.3%)	107	(22.5%)	
Over weight/Obese	35	(23.3%)	93	(28.6%)	128	(26.9%)	

P value is for chi-square test. (Significant at <0.05).

Table-2: Comparison of actual with perceived weight among different BMI groups of university students and accuracy of estimation by gender.

	Underweight n=97	Normal n=252	Overweight/Obese n=126	P value
Mean BMI	17.27(0.87)	20.8(1.06)	27.56(3.5)	
Weight Perception				
Underweight	54	39	4	
Normal	52	173	27	
Overweight	1	28	97	0.00001
Accuracy of estimation	**Male**	**Female**		
Accurate estimation	99(66%)	225(60.2%)		
Under estimation	43 (28.6%)	38 (11.6%)		0.0001
Overestimation	8(5.3%)	62 (19%)		

data of 475 students which was more than the estimated sample size (n=377) but we did not drop the extra and considered the whole number for final analysis (n=475). Out of these 325 (68.4%) were females and 150 (31.5%) were males. Average age of the participants was 20.6±2.4 years. Mean weight of female participants was 52.5±2.8 kg and that of male students remained 64.73±3.5 kg. Mean height of male and female students remained 1.66±0.08 and 1.59±0.06 meters respectively.

Among boys, incidence of underweight, overweight and obesity remained 11.3%, 14.6% and 14% respectively. Whereas, for girls these proportion were 24.6%, 11.3% and 14.15% respectively. 60% males and 49.8% females had normal BMI levels. The difference in measured weight status among male and female students remained statistically significant ($p = 0.008$) (Table-1). The difference in perceived weight status was also considerable ($p < 0.05$).

Amid 97 underweight individuals 43 (44%) considered themselves normal as compared to 126 (23%) of overweight. Of the 252 students with normal body mass index 68.5% showed an accurate supposition while 10 % postulated themselves fat and 20.6 % assumed that they were too thin. The most precise estimation (76.9%) was encountered amongst overweight. The difference was found to be highly significant ($P = 0.00001$).

The diverse patterns of weight estimation among male and female students are explained in Table-2 which depicts that false idea of being fat was more prevalent among girls (19% vs 5%) while incidence of misperceived thinness remained higher amid boys (28.6% vs. 11.6%) ($p< 0.05$).

Among the study participants, 240 (50.5%) were satisfied with their present body weight while 107 (22.5%) respondents wanted to gain and 128 (26.9%) students desired for a thinner body. In underweight group, 37 (46%) girls and 2 (11.7%) boys wished to sustain current body weight while 14 (82.3%) males and 40 (50%) females had a desire to put on. The aspiration to gain weight was noticed in 29 (32.2%) normal weight men and 22 (13.5%) women as well. From overweight/obese section, desire of thinness was observed in 29 (67%) men and 68 (81.9%) women.

Conclusion

Our study has shown almost equal incidence of overweight and underweight among university students with comparatively high prevalence of under weight among female and overweight among male students in Multan. There is a significant misperception of weight, with almost one third of students classifying themselves in a false manner. In addition a high proportion (46%) of underweight girls were contented with their present weight and wanted to maintain that status. This is potentially dangerous as these female students are difficult to persuade to normalize their weight. Health education interventions are therefore required across college and university campuses to defy inaccuracies in weight perception and to encourage healthy body esteem, as underestimation as well as overestimation both can lead to inappropriate and unhealthy weight control practices.

Disclaimer: None to be declared.

Conflict of Interest: There is no potential conflict of interest.

Funding: The study was not funded by any source.

References

1. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004; 363: 157-63.
2. Brener ND, Eaton DK, Lowry R. The association between weight perception and BMI among high school students. Obes Res. 2004; 12: 866-74.
3. Rennie KL, Jebb SA .Prevalence of obesity in Great Britain. Obes rev. 2005; 6: 11-2.
4. Muhammad WNW, Musa IK, Khir AS. Prevalence of over weight and obesity among Malaysian adults: an update. Asia Pac J Clin Nutr. 2011; 20: 35-41.
5. Warraich HJ, Javed F, Faraz-Ul-Haq M, Khawaja FB, Saleem S. Prevalence of obesity in school-going children of Karachi. PLoS One. 2009; 4: e4816.
6. Nanan D. Health status of the Pakistani population. Am J Public Health. 2001; 91: 1545-6.
7. Talamayan KS, Springer AE, Kelder SH, Gorospe EC, Joye KA. Prevalence of overweight misperception and weight control behaviors among normal weight adolescents in the United States. Sci World J. 2006; 6: 365-73.
8. Shah AD, Deen Z, Anwer MO, Qasim M. Weight misperception and rising adolescent obesity. J Pak Med Assoc. 2014; 64: 860.
9. [No authors listed].Obesity: preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser. World Health Organ Tech Rep Ser. 2000; 894: 1-253.
10. Braback L, Hjern A, Rasmussen F. Body mass index, asthma and allergic rhinoconjunctivities in Swedish conscripts - national cohort study over three decades. Respir Med. 2005; 99: 1010-4.