

## STUDENT CORNER

# PERCEIVED WEIGHT STATUS AND WEIGHT MANAGEMENT INTENTIONS OF ADULTS: A CROSS-SECTIONAL STUDY IN PAKISTAN.

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### ABSTRACT

**Objective:** To study the phenomena of weight misperception and to assess the intentions of weight management in the adult population of Karachi, Pakistan. Factors which lead to weight loss efforts will also be identified.

**Methods:** A cross-sectional study was conducted with a total of 450 male and female adults aged 20 to 60 years. Data was collected through purposive sampling technique. All participants had their weight and height measured and filled a questionnaire asking about perceived weight status. Data was analyzed using SPSS version 20. Chi square was used to form associations, with P value of less than 0.05 being taken as significant.

**Results:** Based on body mass index (BMI), 13.3% of the participants were underweight, 54.9% were of normal weight, 25.3% were overweight and 6.4% were obese. Misperception was prevalent in 37.8% (40.3% in females versus 33.1% in males) of the subjects. 28% overestimated their weight and 9.3% underestimated their weight. About 46.7% of underweight, 17.6% of overweight and 31.7% of obese participants were not making any efforts about the discrepancy in their weight. 28% were trying to lose and 28.7% were trying to control their weight. The highest rated reason for this weight consciousness was 'feeling better about myself'.

**Conclusion:** There was more weight misperception in females than males with a tendency of overestimation in females and underestimation in males. More females were trying to lose weight and more males were trying to gain it. A significant number of participants were making efforts that were not in correspondence with their weight status. Satisfaction about self was rated to be more important than health concerns.

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### INTRODUCTION

Weight control intentions and successfully performed practices adopted by overweight and obese individuals significantly reduce their risk of life threatening diseases<sup>1</sup>. Underweight individuals are also highly encouraged by nutritionists to manage their weight status, and adopt a healthier lifestyle, by consuming essential body requirements. According to numerous studies however, a significant proportion of people misperceive their weight<sup>2-5</sup>.

Weight misperception is overestimating or underestimating one's own weight in comparison to one's actual weight status. Several studies emphasize on greater overestimation and weight loss behaviours in females, with a desire for a 'thin physique' stated as the main reason<sup>3</sup>. This can be particularly alarming in obese and overweight individuals<sup>6</sup>. It is essential to assess the pattern of the type of weight intentions of study participants. Overestimation is strongly associated with weight losing intentions, while underestimation with weight gaining intentions<sup>17</sup>. A significant portion of non-overweight and non-obese people have shown to make efforts to

lose weight<sup>4</sup>.

A study on adults investigated that the number one stated reason to lose weight was 'health'<sup>18</sup>. In teenagers, some of the predominant reasons leading to intentions of weight loss were shown to be 'dissatisfaction with current weight' and desiring an 'ideal body weight' appearance owing to social and cultural pressure from media and peers, nutritional lifestyle changes, influence from modernization, and socioeconomic status<sup>2</sup>.

Although it was believed earlier that such patterns were more typical in Western cultures, they are becoming increasingly common in developing countries<sup>9</sup>. It has been found that the highest frequency of people attempting to lose weight is of Asian countries, including Pakistan<sup>4</sup>. Pakistan has relatively been targeted less in terms of studies in this criterion, unlike the western world. Very few studies have been conducted in Karachi on weight perception, with only two on young adults and one on obese and overweight adults. They have all shown significant weight misperception<sup>3, 10, 11</sup>.

This study was done to investigate the weight perception amongst adults in Karachi, to assess their intentions of weight management and to identify reasons for weight loss efforts. This will give us an idea about the prevalence of weight misperception or idealization in the adult population, and the weight changes that people are intending to make. This will also guide us towards taking appropriate measures to create awareness amongst people, about correctly perceiving and managing weight. We also expect to get a clear picture about what factors lead to intentions of losing weight and whether different segments of society are playing the right role in it.

## METHODS

A cross sectional study was used to collect data from October 2015 to December 2015. Data was collected from the students, faculty and staff of a private university in Karachi, Pakistan. Sample size was calculated using the formula  $n = z^2 p(1-p) / d^2$  with  $p = 0.5$  and  $d = 0.05$ . It was calculated to be 384 and was inflated to 450 to compensate for 20% wastage, based on 50% proportion. Purposive sampling technique was used for this study. The criteria included males and females of 20 to 60 years of age.

Participants were required to fill a questionnaire with certain demographic variables including gender, age, income, ethnicity and educational status. Socio-economic status was classified according to educational status, occupation and income. To classify perception as correct or incorrect, compari-

son between actual and perceived weight statuses is essential. Actual weight status of participants was classified using body mass index (BMI) values. BMI of a person is defined as their weight in kilograms divided by the square of their height in meters ( $\text{kg}/\text{m}^2$ ). Participants with BMI values of less than 18.5 were considered underweight, between 18.5 and 24.9 as normal weight, between 25 and 29.9 as overweight, and greater than and equal to 30 as obese<sup>12</sup>. Weight was measured using a weighing machine with no zero error, and height was measured using a measuring scale and a perpendicular surface. For perceived weight status, a part of the study questionnaire asked for the weight classification the participants considered themselves to be in. If the perceived weight status of an individual did not match with their actual weight status, they were considered to misperceive their weight, with more than the actual as overestimation and less than the actual as underestimation. The participants were asked in the questionnaire about whether they were trying to lose, gain, control or do nothing at all with their weight. Those trying to lose/control their weight, were asked to rate each of the following reasons for their weight management concerns; 'health', 'desire for thin physique', 'pressure from family and/or peers' and 'feeling better about themselves'. Scores from 0 to 5 were allotted for each reason, with 0 for strong disagreement and 5 for strong agreement

Data was entered into SPSS Version 20 and descriptive analysis was done. For associations between different categorical values, Chi square test was used. P value less than 0.05 was taken as significant. Ethical approval was obtained by the Community Health Sciences Department from the Ethics Review Committee of Ziauddin University. Informed written consent was obtained from all participants through a consent form given with the questionnaire.

## RESULTS

The sample size of this study was 450, which included 160 (35.6%) males and 290 (64.4%) females. The mean age of the subjects was 27.94 ( $\pm 10.891$ ) years. Majority of the subjects (58%) had only completed their intermediate studies, 20.9% had completed their graduate and 16% postgraduate studies. In terms of socio-economic status, 2.7% considered themselves poor, 3.3% low class, 38.7% middle class, 49.8% upper middle class and 5.6% upper class. About 55% of the subjects were students, with an equal distribution of approximately 6% each amongst teachers, housewives and medical practitioners. The rest of the subjects had a varied range of occupations. Based on body mass index (BMI), 13.3% of the participants were underweight (7.5% in males versus 16.6% in females), 54.9% were normal weight (53.8% in males versus 55.5% in

females), 25.3% were overweight (30% in males versus 22.8% in females) and 6.4% were obese (8.8% in males versus 5.2% in females).

In general, 62.2% of the total subjects perceived their weight status correctly. This percentage was 59.7% in females and 66.9% in males. Weight misperception was present in 37.8% of the subjects (40.3% in females versus 33.1% in males). Out of these, 28% overestimated their weight (15.6% in males versus 34.8% in females) and 9.3% underestimated their weight (16.25% in males versus 5.5% in females). In

males, most misperception was observed with the obese group perceiving themselves as overweight (64.3%), underweight males considering themselves of normal weight (41.7%), overweight males considering themselves underweight (25%) and normal weight males considering themselves overweight (18.6%). In females, most misperception was reported amongst obese females considering themselves overweight (40%), and underweight females considering themselves normal weight (33.3%), followed by overweight females considering themselves obese (28.8%).

**Table 1- Weight misperception along with the actual weight status**

Gender	Weight Status according to BMI	Perceived Weight Status								value
		Underweight		Normal weight		Overweight		Obese		
		N	%	N	%	N	%	N	%	
Females	Underweight	31	64.6	16	33.3	1	2.1	0	0	<0.001
	Normal weight	4	2.5	92	57.1	59	36.6	6	3.7	
	Overweight	0	0	6	9.1	41	62.1	19	28.8	
	Obese	0	0	0	0	6	40	9	60	
Males	Underweight	7	58.3	5	41.7	0	0	0	0	<0.001
	Normal weight	5	5.8	63	73.3	16	18.6	2	2.3	
	Overweight	12	25	0	0	34	78.8	2	42.2	
	Obese	2	14.3	0	0	9	64.3	3	21.4	

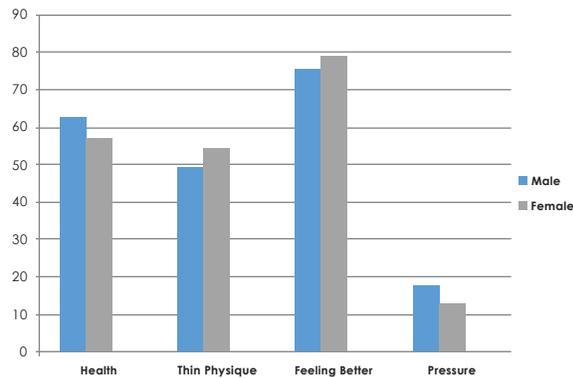
Overall, 28% were trying to lose weight, 12% trying to gain weight, 28.7% trying to control weight and 31.3% were doing nothing about their weight. Figure 2 has complete data on intentions of weight management corresponding to the actual weight statuses and the perceived weight statuses.

When compared with gender, more males were trying to gain weight (18.8% versus 8.3%), while more females were trying to lose (29.3% versus 25.6%), control (29.7% versus 26.9%) and do nothing about their weight (32.8% versus 28.7%). Association of gender with intention of weight management was found to be significant with a p-value of 0.013.

**Table 2- Intentions of weight management**

Weight Status		Intentions of weight management				
		Lose % (n)	Gain % (n)	Control % (n)	Nothing % (n)	P Value
Actual Weight Status	Underweight	1.7 (1)	41.7 (25)	10 (6)	46.7 (28)	<0.001
	Normal weight	23.1 (57)	11.7 (29)	31.2 (77)	34 (84)	
	Overweight	48.2 (55)	0 (0)	34.2 (39)	17.5 (20)	
	Obese	44.8 (13)	0 (0)	24.1 (7)	31 (9)	
Perceived Weight Status	Underweight	0 (0)	55.3 (26)	4.3 (2)	40.4 (19)	<0.001
	Normal weight	14.8 (29)	14.3 (28)	32.1 (63)	38.8 (76)	
	Overweight	47 (78)	0 (0)	33.1 (55)	19.9 (33)	
	Obese	46.3 (19)	0 (0)	22 (9)	31.7 (13)	

In both genders, the highest rated reason was 'feeling better about myself', followed by 'health concern', 'desire for a thin physique' and 'family/peer pressure'. However, in females the reason of 'health concern' (57.2%) was almost equally as frequent as that of 'thin physique' (54.3%).



**Figure 1- Reasons to lose/control weight in the participants**

**The percentage of participants according to gender who rated the mentioned reasons as 4/5 and 5/5 (strong agreement) behind their efforts to lose/control weight has been shown. The reasons were 'health concerns', 'thin physique', 'feeling better about myself' and 'peer/family pressure'**

## DISCUSSION

In our study, the proportion of underweight, normal weight, over weight and obese subjects was 13.3%, 54.9%, 25.3% and 6.4% respectively. According to the most recent Global Database of BMI by WHO, Pakistan is shown to have approximately 31.2% underweight, 54.4% normal weight, 14.4% overweight and 3.4% obese populations<sup>12</sup>. Except for the normal weight category, our study's data in Karachi shows different statistics than the rest of the country, including a lower percentage of underweight and a higher percentage of overweight and obese individuals. Weight perception is a phenomenon focused relatively more in the rest of the world with more studies targeting teenaged school going subjects than adults. To the best of our knowledge, only three studies have been carried out in the city of Karachi. Two studies were conducted on university going students<sup>3, 10</sup> with one study focusing on female university students only<sup>3</sup>. The third study focused mainly on underestimation of weight in the adult population of Karachi<sup>11</sup>.

Overall prevalence of weight misperception in our study (37.8%) falls in between data from other studies done on both genders (42.4% and 33%).

In young adults, overall misperception was 36.9% in

Mexico<sup>13</sup>, and 50.2% misperceived their weight status in China (14.3% overestimation and 35.9% underestimation)<sup>14</sup>. Previously, a study conducted on university students in twenty two low, middle and emerging economy countries, reported a 19% overestimation<sup>4</sup>, and 41% was reported in obese and overweight adults in Mauritius<sup>6</sup>. In studies conducted on older individuals with mean age above 40, 40.1% misperception was prevalent in the US with more underestimation than overestimation<sup>15</sup>, and 18% underestimation and 7% overestimation was found in Switzerland<sup>16</sup>.

In our study, females misperceived their weight more than males. Overall, 28% of the subjects overestimated their weight. Females overestimated their weight approximately twice more than males (34.8% versus 15.6%). On the other hand, 9.3% of the participants underestimated their weight with males twice more than females (16.25% versus 5.5%). Similar to the trend in our results, overestimation has been strongly associated with the female gender and underestimation with the male gender in multi-parts of the world<sup>5, 7, 10, 16-19</sup>.

According to a study, overestimation in adolescents is associated with higher weight loss intentions along with increased risk of practicing weight loss methods that are deemed injurious to health<sup>[20]</sup>. Our study shows that the number of participants who are trying to lose weight is much higher than the numbers who actually need to lose weight. This is a reflection of high prevalence of weight misperception. Only 54% of the participants trying to lose weight actually fall in the overweight or obese categories according to their BMI. The rest of the 45.2% were actually of normal weight, out of which half were overestimating their weight. This can show that an equal number of correctly perceiving and overestimating normal weight individuals were not satisfied with their weight and were making efforts to lose it. Peltzer et al. reported 27% non-overweight/obese university students making efforts to lose weight from 22 countries. This was much higher among women (34.6%) than men (16.5%). This overall percentage was, however, below 20% in the Caribbean, South America and sub-Saharan Africa, and above 20% among students in North Africa, Near East, Central Asia and most other Asian countries including Pakistan, Bangladesh, Singapore, Thailand and Philippines<sup>4</sup>. The perceived and actual weight statuses both had the same p-value, with an association with weight management intentions. This tells us that not much can be said about which can be a more positive predictor about weight management intentions.

In our study, out of those trying to gain weight, half were normal weight and half underweight individuals. However, we do not have knowledge of the extent of the efforts made to gain weight, due to which not much can be said about whether these

efforts in normal weight individuals can lead to being overweight or even obese. Where all underweight people should be working on gaining weight, 46.6% are doing nothing at all and 10% are trying to control their weight. This should be brought to attention since being underweight can predispose people to osteoporosis, menstrual irregularities and weak immunity<sup>3</sup>. Efforts of just weight control have majority of normal weight individuals followed by overweight and obese.

Another distinctive result is that although none of the overweight or obese participants wanted to gain more weight, 20.3% of them were not intending to do anything regarding their weight (14.2% in overweight and 6.4% in obese) and 32.1% were trying to just control their weight when they should have been working on losing it (34.2% in overweight and 24.1% in obese). Improper management of an overweight status can lead to obesity and its long-term complications. It is associated in adults with diabetes mellitus Type 2, hypertension, dyslipidemia, heart disease, cerebrovascular disease, metabolic syndrome and certain other systemic conditions<sup>21</sup>. Oddly, even after overestimating their weight in the overweight and obese categories, a few participants were doing nothing about their weight.

In our findings, more males underestimated their weight and more females overestimated their weight. Having said that, as one would expect, more males were trying to gain weight and more females were trying to lose or control their weight. Where only 7.5% of males in our study were of underweight category, 18.8 % were trying to gain weight. Where only 31.7 % females were overweight or obese, 59% were trying to lose or control their weight. Similar pattern of more females trying to lose weight than males has been seen previously<sup>25</sup>.

Ideally the primary reason to lose/control weight in both males and females should be concern about health. However, majority of the people gave higher rates to 'feeling better about myself'. Health is still the second highest rated reason overall and greater in males (62.8%) as compared to females (57.2%). Females are almost equally worried about health and having a thin physique. It has been reported previously that both genders have different primary concerns for losing weight and more men have claimed health concern as a trigger<sup>8</sup>. The desire for a thin physique is a stronger reason to control/lose weight amongst females (54.3%) as compared to males (49.4%). According to a previous study conducted in Pakistan, females tend to be oversensitive towards their weight status because they are influenced more by family and social pressures<sup>10</sup>. A study conducted in India reported overweight younger females to have the highest body dissatisfaction<sup>22</sup>. Similar findings were observed in a study conducted on adolescent

females in the US. In this, they also found overweight girls to have lower self-esteem than normal weight girls and an association of influence from friends about ideal body image was also observed<sup>23</sup>.

In our culture, a major reason identified to lose weight, especially in the younger females (15-24 years), is projection by the media that tends to motivate and pressurize people to be of a certain weight and physique. In males, a smaller percentage is concerned about thin physique or influenced by peer pressure, because a heavier body structure or muscular model is preferred<sup>10</sup>. However, a study on Australian adults and one on Malaysian adolescents reported health concern as the number one reason to lose weight<sup>8, 24</sup>.

Most of the studies conducted on this subject target a younger age group, so there is very limited data targeting the range of 20 to 60 years in our country. This study being conducted in Karachi portrays a good outlook of urban cities in the developing world. In this study, it was beneficial that the anthropometric measurements were performed by the researchers, not having to rely on self-reported weight and height.

The study had certain limitations. We targeted the adult age group of Karachi, but the mean age was 27.94 years. The data was unequally divided in terms of gender with more female than male subjects. Voluntary participation along with anthropometric measurements could have led to a selection bias.

## CONCLUSION

Our study showed that more than half the participants were of normal weight. Women outweighed men in the underweight class and the male proportion was higher in the overweight and obese classes. Overestimation was seen more in females while underestimation more in males. More males were trying to gain while more females were trying to lose and control their weight. For majority, feeling better about themselves turned out to be the most important reason to try to lose or control their weight, while health concern was the second highest rated reason. Emphasis should be made on creating awareness about obesity and its complications. The social stigma regarding an ideal body image should also be discouraged. Focus should be made on informing and properly counseling people about their weight category and management, to avoid misperception and inaccurate weight management behaviors.

## REFERENCES

1. Yoong SL, Carey ML, Sanson-Fisher RW, D'Este C.

- A cross-sectional study assessing the self-reported weight loss strategies used by adult Australian general practice patients. *BMC Family Practice*. 2012;13:48.
2. Bhurtun DD, Jeewon R. Body Weight Perception and Weight Control Practices among Teenagers. *ISRN Nutrition*. 2013;2013:1-6.
  3. Sirang Z, Bashir HH, Jalil B, Khan SH, Hussain SA, Baig A et al. Weight patterns and perceptions among female university students of Karachi: a cross sectional study. *BMC Public Health*. 2013;13:230.
  4. Peltzer K, Pengpid S. Trying to lose weight among non-overweight university students from 22 low, middle and emerging economy countries. *Asia Pacific Journal of Clinical Nutrition*. 2015;24(1):177-83.
  5. Linder J, McLaren L, Siou GL, Csizmadia I, Robson PJ. The Epidemiology of Weight Perception: Perceived Versus Self-reported Actual Weight Status among Albertan Adults. *Can J Public Health*. 2010;101:56-60.
  6. Caleyachetty R, Kengne AP, Muennig P, Rutter H, Echouffo-Tcheugui JB. Misperception of body weight among overweight or obese adults in Mauritius. *Obesity Research and Clinical Practice*. 2016;10(2):216-219.
  7. Patte KA, Laxer R, Qian W, Leatherdale ST. Weight Perception and Weight-control Intention among Youth in the COMPASS Study. *Am J Health Behav*. 2014;40(5):614-623.
  8. Yoong SL, Carey ML, Sanson-Fisher RW, D'Este CA. A cross-sectional study assessing Australian general practice patients' intention, reasons and preferences for assistance with losing weight. *BMC Family Practice*. 2013;14:187.
  9. Maletle L, Motlhoiwa K, Shaibu S, Wrotniak BH, Maruapula SD, Jackson J, et al. Body image dissatisfaction is increased in male and overweight/obese adolescents in Botswana. *Journal of Obesity*. 2013;2013:7.
  10. Saleem MD, Ahmed G, Mulla J, Haider SS, Abbas M. Weight misperception amongst youth of a developing country: Pakistan -a cross-sectional study. *BMC Public Health*. 2013;13:707.
  11. Bhanji S, Khuwaja AK, Siddiqui F, Azam I, Kazmi K. Underestimation of weight and its associated factors among overweight and obese adults in Pakistan: a cross sectional study. *BMC Publ Health*. 2011;11:363.
  12. WHO Global Database on Body Mass Index. 2017. <http://apps.who.int/bmi/index.jsp>. Accessed 22 Jan 2017.
  13. Andrade F, Raffaelli M, Teran-Garcia M, Jerman J, Garcia C. Weight status misperception among Mexican young adults. *Body Image*. 2012;9:184-188.
  14. Xu BY, Zhang YH, Ma WJ, Xu YJ, Song XL, Nie SP, et al. Prevalence regarding weight misperception and related influencing factors among residents in Guangdong province. *Zhonghua Liu Xing Bing XueZaZhi*. 2011;32(10):964-968.
  15. Wang ML, Haughton CF, Frisard C, Pbert L, Geer C, Lemon SC. Perceived weight status and weight change among a U.S. adult sample. *Obesity*. 2016;25:223-228.
  16. Rouiller N, Marques-vidal P. Prevalence and determinants of weight misperception in an urban Swiss population. *Swiss Med Wkly*. 2016;146:1-7. doi:10.4414/smw.2016.14364.
  17. Joh HK, Oh J, Lee HJ, Kawachi I. Gender and socioeconomic status in relation to weight perception and weight control behavior in Korean adults. *Obesity Facts*. 2013;6:17-27.
  18. Kurdak H, Bozdemir N, Saatci E, Ozturk P, Ozcan S, Akpinar E. Self-perceived body weight status and weight-control behaviors of high school students in a southern city of Turkey. *CollAntropol*. 2010;34(4):1295-1302.
  19. Jáuregui-Lobera I, Bolaños-Ríos P, Santiago-Fernández MJ, Garrido-Casals O, Sánchez E. Perception of weight and psychological variables in a sample of Spanish adolescents. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*. 2011;4:245-251.
  20. Fan M, Jin Y. The Effects of Weight Perception on Adolescents' Weight-Loss Intentions and Behaviors: Evidence from the Youth Risk Behavior Surveillance Survey. *International Journal of Environmental Research and Public Health*. 2015; 12:14640-14668.
  21. Segula D. Complications of obesity in adults: A short review of the literature. *Malawi Medical Journal*. 2014;26(1):20-24.
  22. Stigler MH, Arora M, Dhavan P, Shrivastav R, Reddy KS, Perry CL. Weight-related concerns and weight-control behaviors among overweight adolescents in Delhi, India: a cross-sectional study. *Int J Behav Nutr Phys Act*. 2011;8:9.
  23. Thompson JK, Shroff H, Herbozo S, Cafri G, Rodriguez J, Rodriguez M. Relations among multiple peer influences, body dissatisfaction, eating disturbance, and self-esteem: A comparison of average weight, at risk of overweight, and overweight adolescent girls. *J Pediatr Psychol*. 2006;32(1):24-29.
  24. Khor GL, Zalilah MS, Phan YY, Ang M, Maznah B, Norimah AK. Perceptions of body image among Malaysian male and female adolescents. *Singapore Med J*. 2009;50(3):303-311.
  25. Wang Y, Liang H, Chen X. Measured body mass index, body weight perception, dissatisfaction and control practices in urban, low-income African American adolescents. *BMC Public Health*. 2009;9:183. doi:10.1186/1471-2458-9-183.