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Research Article

A Population-Based Study on Agreement between Actual and Perceived Body Image

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Abstract

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Background: Obesity tends to appear in modern societies and constitutes a significant public health problem with an increased risk of cardiovascular diseases.

Objective: This study aims to determine the agreement between actual and perceived body image in the general population.

Methods: A descriptive cross-sectional study design was conducted with a sample size of 300. The data were collected from eight major populated areas of the Northern district of Karachi Sindh over a period of six months (10th January 2020 to 21st June 2020). The Figure rating questionnaire scale (FRS) was applied to collect the demographic data and perception about body weight. Body mass index (BMI) is used for assessing the actual body weight status. Cohen's Kappa statistics were performed.

Results: Out of 300 participants, n=143 were males, and n=157 were females. In reality, according to BMI, 6 % were underweight, 47 % were average, 28 % were overweight, and 19 % were obese. According to perception, 8% of participants were underweight, 39 % were average, about 45% were overweight, and 8 % were obese. The mean score of real BMI was 25.51±5.62 and the figure rating score was 4.81±1.75. r value showed a strong positive relationship between both variables with a P-value of <0.001. Cohen's Kappa score was 0.362. The rate of agreement between actual and perceived body weight status in the general population was 53.88%, and the disagreement rate was 46.12%

Conclusion: There was a weak agreement in the perception and realities of the self-image of people who have the wrong impression about their body image.

Introduction

Obesity or overweight is an abnormal pattern of fat accumulation in adipose tissue that leads to some significant health problems and increases the risk of cardiovascular diseases [1]. Globally, the incidence of overweight and obesity is more among women as compared with men. The prevalence of obesity among women is 36%, whereas men contribute about 13%. In comparison, the prevalence of overweight among women is 31% and among men is 34% [2]. The Body image to be described as a personal opinion, realization, mind-set, and thoughts regarding their own body. It is dependent on various factors like

psychological components and socio-cultural influences such as family, peers, and ethnicity [3]. Real weight status and perceived weight status could be fluctuating, because individuals may evaluate their weight based on comparison of themselves with others, or with what society has set as weight values, comparatively than based on their actual weight status. An individual might evaluate themselves as having average or underweight while being overweight or obese in reality. Individual behaviors for obesity prevention or management may be different and depend on how they perceive their body weight. This evaluation may cause one not to try healthy weight control through proper exercise or diet intake or to start it too late, bringing about severe diseases including cardiovascular diseases, hypertension, and diabetes caused by obesity

[4]. Literature has indicated that about 26% of normal weighed females perceived themselves as overweight and 2% as obese whereas 12%, normal weighed males perceived themselves as overweight and no one perceived as obese [2].

Unsuitable body image desire might influence individuals to unhealthy weight-loss or weight-gain behaviors. Appropriate perception of personal weight is one of the promoting factors for weight-control behaviors and is a better prognosis of actual weight than diet or exercise. For prevention and decline the excessive weight, reasonable perception, and self-awareness of own body weight are necessary [5]. Moreover, the level of body disappointment may be encouraging for individuals with standard or above-average weight, as it may lead to healthy weight management behaviors such as increased intake of fruits and vegetables and regular physical activity [6]. The emotional and behavioral responses might follow the personal opinion of individual body size. In general, men are less likely worried about their body weight as compared to women. The women have to experience dissatisfaction about their weight and are linked with activities to lose bodyweight [7].

Subjects and Methods

A Descriptive cross-sectional study design in which we recruited a sample size of n=287. This sample was calculated by considering the following parameters $Z_{1-\alpha/2}$ (Z score for level of significance) = 1.96 $Z_{1-\beta}$ (Z score for power) = 1.28 r (Relationship established in the previous study) = 0.19.1 In this survey, The Population data were collected from different urban and rural areas of North Karachi Sindh, with a period of six months (January to June 2020). In the Null Hypothesis $H_0=$, There is no agreement between actual and perceived body image in the general population. In contrast, in the Alternate Hypothesis $H_a=$, There is an agreement between actual and perceived body image in the general population.

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2}{\frac{1}{4} \left[\log_e \left(\frac{1+r}{1-r} \right) \right]^2} + 3$$

Data Collection Procedure

The Primary data were collected from eight populated areas including, Public Parks, Hospitals, Universities, Colleges, Schools, Clinics, markets, and Hotels of Karachi Sindh. A simple random sampling technique was applied considering the population size of North Karachi. In the sample selection criteria, we included students, teachers, doctors housewife, nurses, and the businessman. We excluded the participants with a poor mental status and having a physical disability, and respondents who did not agree to participate in this survey.

In the Research Questionnaire, we have used the Figure rating scale to assess the body image and individual perceived physical appearance and the scale comprises a sequence of nine male or female figure drawings of more significant than ever body size [8]. The general population received the research questionnaire after informed consent. The personal

information of individuals was kept hidden and secured. The consent form contains several parts, Part A of the tool contains the demographic data, and Part B contains a figure rating scale. For perceived body image, the participant had to encircle one number given in scale, and for actual body image, the researcher has to measure the weight using the machine and the participant's height was changed in the meter squares to measure the BMI. The Primary data were analyzed using SPSS version 16. Cohen's Kappa statistics were applied to observe the agreement between the actual and perceived body image [17]. The P-value of 99% was considered statistically significant.

Ethical Consideration

Ethical consideration was ensured during the data collection period. The personal information of an individual was kept confidential. The study did not affect any individual's ethical values of the participants.

RESULTS

In the demographics Table 1, out of n=300 participants, n=143 were males, and n=157 were females. In reality, according to BMI, 6 % were underweight, 47 % were standard, 28 % were overweight, and 19 % were obese. According to perception, 8 % of participants were underweight, 39 % were standard, 45 % were overweight, and 8 % were obese.

In Table 2. Participants that were underweight according to BMI and out of these n=18, perceived themselves as underweight and n=8 as usual. However, n=142 participants were normal according to BMI, and out of these, 13 perceived themselves as underweight, 89 as normal, and 39 as overweight, and n=1 as obese. While n=83 participants were overweight according to BMI and out of these n=21 perceived themselves as normal, n=56 as overweight, and remaining n=06 as obese. Out of 300 participants, n=57 were obese, and out of these 40 perceived themselves as overweight. Only 17 perceived themselves as obese—the value of kappa (0.363 shows considerably weak agreement between reality and perception.

Table 3 has shown the relation between perception and reality with a mean score of real BMI was 25.51 ± 5.62 , and figure rating score was 4.81 ± 1.75 . But r value has shown a strong positive relationship between both variables

Table 1 Socio Demographic Profile

Variable	Frequency n=300	Percentage	
Gender	Male	143	47.5
	Female	157	52.2
BMI Score (Reality)	Underweight	18	6.0
	Normal	142	47.3
	Overweight	83	27.7
	Obese	57	19.0
Self-Image (perception)	Underweight	23	7.7
	Normal	118	39.3
	Overweight	135	45.0
	Obese	24	8.0

Table 2 Measure of Agreement between self-perception and reality

Self Image (Perception; Figure rating scale)	BMI Score (Reality)				Kappa	p-value
	Under Weight	Normal	Overweight	Obese		
Underweight	10(55.6%)	13(9.2%)	0(0%)	0(0%)	0.363	<0.001
Normal	8(44.4%)	89(62.7%)	21(25.3%)	0(0%)		
Overweight	0(0%)	39(27.5%)	56(67.5%)	40(70.2%)		
Obese	0(0%)	1(0.7%)	6(7.2%)	17(29.8%)		
Total	18(100%)	142(100%)	83(100%)	57(100%)		

* P-value significant at or less than 0.05

Table 3 Relation between Perception and Reality

Self-Image	Real (BMI)	Perceived (Figure Rating Score)	Pearson Correlation (r)
Score	25.51 ±5.62	4.81±1.75	0.74

* P-value significant at or less than 0.05

DISCUSSION

As a result, females did not perceive their weight as being too high. Overall, the percentage of subjects who were healthy, perceived themselves as overweight (45%) was higher than that of those who considered themselves as underweight (8%) having similar to the previous study, that conducted in American adolescents, in which no significant gender difference was found, with the majority of the population could not properly categorize their weight status [6]. The findings were similar to the other studies, in which normal females tend to perceive correct judgment of their own as compared to the wrong perception [10,12,13,14].

The Mexican National Health and Diet survey [16] evaluated the impact of sex and diagnosis of obesity/overweight by healthcare practitioners from which the Self-perceived and desired BMIs were evaluated using a numeric rating scale questions and compared to actual BMIs. Only 8.8% and 6.1% of the diagnosed and non-diagnosed obese are correctly identified as such. For obese, 20.2% of non-diagnosed subjects and 12.7% of diagnosed subjects are viewed as normal or underweight, while 49.1% and 37% were satisfied with their perceived BMI. Our findings in terms of the self-image real BMI mean score was observed at 25.51 and SD 5.62, along with the perceived figure rating mean score of 4.81 and 1.75 SD. A recent study by Berry et al [17] showed the generalization of perceived body measurement, in which Cohen's kappa statistic is also used to calculate the consensus between two observers using categorical polytomies. In that study, Cohen's statistics are seen to be essentially multivariate; are expanded to evaluate ordinal and interval data, and are extended to more than two observers. A non-asymptotic significance test is given for general statistical purposes.

Research by Paeratakul et al. estimated that overweight self-perception was more prevalent in females compared to males and in whites compared to blacks or Hispanics. In average weight and overweight white women, both the right and incorrect perception of overweight was more prevalent compared to black women [7]. Whereas, our research also included a P-value of <0.001 and 29.8 percent of obesity and 7.2 percent overweight, and the demographics were solely based on the Asian Pakistani population. The previous research using the Stunkard's Figure Rating Scale for measurement results found that boys were slightly taller (p<0.001), heavier (p<0.001), and had a higher BMI (p<0.001) than girls [8]. However, in our observations, the total

the male count was 45.5% and the self-perception score of obese was around 8.0. The limitations of the self-reported correlation analysis revealed that there was a disparity between direct and indirect social comparisons, indicating that indirect comparisons precede direct comparisons since both questions did not explicitly follow one another and one visual aid used and the other a direct line of inquiry, we cannot be sure that these two types of measuring did not affect each other [9]. The intensity of our analysis was focused on the degree of consensus rather than social contrast, which was comparatively higher for overweight people. Based on perception and the degree of agreement, especially among women, our findings were particularly inconsistent with the Japanese analysis of office workers, which provided that the degree of agreement between BMI and weight perception differed between age and sex [10]. The Italian study concluded that females displayed a higher degree of dissatisfaction than men and that the number of overweight/obese children increased. There was a difference between self-perception and the actual nutritional condition of the subject in 6–9% of overweight/obese children [11]. Our study recorded that the majority of females reported around 52.2% and the total BMI overweight of 27.7%.

In females, the ideal body weight is thinner than their perceived body image, which means that females desire to be slimmer [12]. The outcomes of this study were different from previous studies, in which more girls considered themselves to be overweight and more boys considered themselves to be underweight [5]. The reason for the increased prevalence of obesity being higher among females than males indicated that the agreement between actual and perceived body image was more considerable in females (kappa= 0.38) as compared to males (kappa= 0.32). So that the rate of agreement between actual and perceived body weight status in the general population was 53.88% and the disagreement rate was 46.12%. Therefore, the agreement was higher in the general population. Another study that was conducted on the Korean adult population is consistent with our findings, that only 17 perceived themselves as obese—the value of kappa (0.363 shows considerably weak agreement between reality and perception. The community health survey, concerning the associations between discordance of body image and physical activities among adults aged 19 to 64 years, reflected that the subjects who showed agreement between their body weight perception and their actual body weight were 74.9%, while disagreement was 25.1% [18]. These results differ from previous studies, in which the rate of agreement between actual and perceived body image was 45.2%, and disagreement was 58.8%. The disagreement was higher in adolescents [4].

The outcomes of this study, concerning the agreement of actual and perceived body image, an underweight agreement was found in 55.56%, average weight 62.68%, overweight 67.47%, and obese 29.82%. The level of agreement was relatively higher in overweight. So the results of this study were quite different from other cross-sectional studies involving primary school children and adolescents which considered that a large number of the population perceived themselves as underweight even though they were healthy [13,14,15]. Therefore, health improvement strategies targeting to design the health education methods that help them perceive themselves as obese when their weight

is obese and normal when their weight is healthy. In Pakistan, there are no sufficient studies on body image, and it is not as much as necessary to aware the people with body image. This study would be helpful to think about perception and reality positively.

This study still had a few limitations. The small sample size was a concern to include the dense population parameters. We understood that a more reliable scale should have used for assessing the perception that varies from different to every person to person and population. Therefore, the outcome was unbiased and calculated as random.

CONCLUSION

There was a weak agreement in the perception and reality of body image, and a large number of people have the wrong perception about their body image. The real awareness of body image can help to control the dilemma of overweight and obesity and promote a healthy lifestyle. According to this study, the majority of obese and overweight peoples do not consider themselves as having excess body weight.

Recommendations

Health professionals should provide the information and make people understand the health risks associated with an excess of body weight.

Conflicts of interest

The authors have no conflicts of interest relevant to this article

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REFERENCES

- [1] Jafari-Adli, S., et al., *prevalence of obesity and overweight in adults and children in Iran; a systematic review*. Journal of Diabetes & Metabolic Disorders, 2014. **13**(1): p. 121.
- [2] Muhihi, A.J., et al., *obesity, overweight, and perceptions about body weight among middle-aged adults in Dar es Salaam, Tanzania*. ISRN obesity, 2012. **2012**.
- [3] Zaccagni, L., et al., *Body image and weight perceptions in relation to actual measurements by means of a new index and level of physical activity in Italian university students*. Journal of translational medicine, 2014. **12**(1): p. 1.
- [4] Shin, S.M., *Agreement Between Actual and Perceived Body Weight in Adolescents and Their Weight Control Behaviors*. Journal of Obesity & Metabolic Syndrome, 2017. **26**(2): p. 138-146.
- [5] Cheung, P.C., et al., *A study on body weight perception and weight control behaviours among adolescents in Hong Kong*. Hong Kong medical journal, 2007. **13**(1): p. 16.
- [6] Wang, Y., H. Liang, and X. Chen, *Measured body mass index, body weight perception, dissatisfaction and control practices in urban, low-income African American adolescents*. BMC public health, 2009. **9**(1): p. 183.
- [7] Paeratakul, S., et al., *Sex, race/ethnicity, socioeconomic status, and BMI in relation to self-perception of overweight*. Obesity, 2002. **10**(5): p. 345-350.
- [8] Lo, W.-S., et al., *The Use of Stunkard's figure rating scale to identify underweight and overweight in Chinese adolescents*. PloS one, 2012. **7**(11): p. e50017.
- [9] Lev-Ari, L., I. Baumgarten-Katz, and A.H. Zohar, *Mirror, mirror on the wall: How women learn body dissatisfaction*. Eating behaviors, 2014. **15**(3): p. 397-402.
- [10] Inoue, M., et al., *Degree of agreement between weight perception and body mass index of Japanese workers: MY Health Up Study*. Journal of occupational health, 2007. **49**(5): p. 376-381.
- [11] Gualdi-Russo, E., et al., *Weight status and body image perception in Italian children*. Journal of human nutrition and dietetics, 2008. **21**(1): p. 39-45.
- [12] Hatami, M., et al., *Relationship between body image, body dissatisfaction and weight status in Iranian adolescents*. Archives of Obesity, 2015. **1**(1): p. 1-7.
- [13] Mpembeni, R.N., et al., *Overweight, obesity and perceptions about body weight among primary schoolchildren in Dar es Salaam, Tanzania*. Tanzan J Health Res, 2014. **16**(4): p. 304-11.
- [14] Standley, R., V. Sullivan, and J. Wardle, *Self-perceived weight in adolescents: Over-estimation or under-estimation?* Body Image, 2009. **6**(1): p. 56-59.
- [15] Alipour, B., et al., *Body image perception and its association with body mass index and nutrient intakes among female college students aged 18–35 years from Tabriz, Iran*. Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 2015. **20**(4): p. 465-471.
- [16] Easton, J.F., C.R. Stephens, and H.R. Sicilia, *an analysis of real, self-Perceived, and Desired BMI: is There a need for regular screening to correct Misperceptions and Motivate Weight reduction?* Frontiers in public health, 2017. **5**: p. 12.
- [17] Berry, K.J. and P.W. Mielke Jr, *A generalisation of Cohen's kappa agreement measure to interval measurement and multiple raters*. Educational and Psychological Measurement, 1988. **48**(4): p. 921-933.
- [18] Chun, I., et al., *The associations between discordance of body image and physical activities among adults aged 19 to 64 years: based on the data from 2010 community health survey*. The Korean Journal of Obesity, 2014. **23**(4): p. 274-280.



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