AGREEMENT BETWEEN ACTUAL AND PERCEIVED BODY IMAGE IN GENERAL POPULATION OF LAHORE

Original Research

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ABSTRACT

Background: Obesity continues to rise globally and remains a major public health challenge, contributing significantly to the burden of cardiovascular diseases, type 2 diabetes, and other chronic conditions. One key barrier to effective weight management is the misperception of body image, where individuals fail to accurately assess their weight status. Encouraging accurate self-awareness through health education and behavioral interventions is crucial for promoting healthy lifestyles and preventing obesity-related complications.

Objective: To determine the level of agreement between actual and perceived body image among the general population of Lahore.

Methods: This analytical cross-sectional study was conducted in Lahore over a six-month period, following ethical approval from the institutional review board. A total of 300 individuals were selected using simple random sampling from urban and rural areas. Data were collected using a validated Figure Rating Scale, which included sections on demographic information and self-perceived body image. Actual body weight status was assessed through direct measurements of height and weight to calculate Body Mass Index (BMI). The degree of agreement between perceived and actual body image was evaluated using Cohen's Kappa statistics and Pearson correlation.

Results: Of the 300 participants, 47.5% were male (n=143) and 52.5% female (n=157). Based on BMI, 6% were underweight, 47.3% normal, 27.7% overweight, and 19% obese. In contrast, perceived weight status revealed 7.7% as underweight, 39.3% as normal, 45% as overweight, and 8% as obese. The mean BMI was 25.51±5.62 and the mean figure rating score was 4.81±1.75. A strong positive correlation was observed (r=0.74, p<0.05). The overall agreement between actual and perceived body weight status was 53.88%, with 46.12% showing disagreement.

Conclusion: There was a weak agreement between perceived and actual body image, highlighting a substantial gap in self-awareness. Promoting body image awareness through targeted education may play a vital role in reducing obesity and encouraging healthier lifestyle choices.

Keywords: Body Mass Index, Body Image, Cross-Sectional Studies, Health Behavior, Obesity, Perception, Self-Concept.

INTRODUCTION

Obesity and overweight represent a pathological accumulation of body fat in adipose tissue that contributes significantly to a range of chronic health conditions, including hypertension, cardiovascular disease, type 2 diabetes, and certain types of cancer. Over recent decades, the global prevalence of obesity has escalated alarmingly, becoming one of the most pressing public health issues of the 21st century (1). Strikingly, this burden is more prominent among women than men, with recent global estimates suggesting obesity prevalence at 36% among women compared to 13% in men, and overweight prevalence at 31% among women versus 34% in men (2). These statistics point not only to a gendered disparity in weight distribution but also hint at possible differences in how body image is perceived and internalized across populations. Body image refers to the perception, attitude, and emotional response an individual has about their own body. It is shaped by a complex interplay of psychological factors and socio-cultural influences including family norms, peer pressures, media portrayals, and cultural expectations (3,4). Misalignment between actual weight status and perceived body image can significantly affect an individual's health behaviors and psychological well-being. In a cross-sectional study, discrepancies between anthropometric measurements and perceived body image in overweight children revealed a critical gap between actual and perceived weight status, suggesting a potential barrier in adopting appropriate dietary or lifestyle interventions (5).

This incongruence is not uncommon; individuals often assess their body weight through comparisons with societal standards or peer references rather than clinical indicators such as body mass index. Consequently, many individuals with overweight or obesity might misperceive themselves as being of normal or even underweight status, reducing the likelihood of initiating timely weight management behaviors (6). This misjudgment could delay interventions, leading to the progression of obesity-related conditions. Conversely, some individuals with normal weight may perceive themselves as overweight or obese, especially among women, which could promote body dissatisfaction and unhealthy weight control behaviors such as disordered eating or excessive exercise (7,8). Research highlights that appropriate perception of one's own weight is a significant determinant of engaging in weight-control behaviors. For instance, individuals who accurately assess their weight status are more likely to adopt beneficial habits such as increasing physical activity and improving dietary intake (9). However, this perception is often influenced by gender norms. Women, in general, are more concerned about their weight and body image, frequently experiencing dissatisfaction that may lead to continuous efforts to lose weight, whereas men tend to be less preoccupied with weight issues (10). A study found that, underestimation of body weight was more prevalent than overestimation, particularly among obese adults and young males, further complicating the development of tailored interventions (11).

Among adolescents, body image dissatisfaction has also been associated with actual weight status. A study showed that, body image dissatisfaction increases with rising weight status, even at an early age. This psychological distress, while sometimes motivating positive behavioral changes, also has the potential to contribute to low self-esteem and emotional disturbances if not addressed within a supportive framework (12). Therefore, recognizing how individuals perceive their body weight—and the consequences of such perceptions—is fundamental to the design of effective public health interventions. Given these considerations, this study aims to assess the alignment between actual and perceived body image among individuals and explore how body image perception influences self-awareness and engagement in weight management behaviors. The objective is to generate insights that may inform the development of more personalized and psychologically informed obesity prevention strategies.

METHODS

This analytical cross-sectional study was conducted over a six-month period following the approval of the research synopsis by the institutional review board. A total of 300 participants were recruited using multistage random sampling to enhance the representativeness of the population. Initially, Union Councils within Lahore were listed, and ten areas were randomly selected through a simple random sampling technique. Data collection took place across a range of settings, including public parks, hospitals, universities, colleges, schools, clinics, and hotels located in both urban and rural regions of Lahore. Participants included individuals from the general population who were mentally sound, physically able, and willing to provide informed consent. Those with any form of cognitive impairment, physical disability, or unwillingness to participate were excluded. Ethical approval for the study was obtained from the Institutional Review Board (IRB). Ethical considerations were maintained throughout the study. Informed written consent was obtained

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from all participants after they were briefed on the purpose and procedures of the study. Personal information was kept strictly confidential, and data was anonymized and securely stored to ensure privacy.

The Figure Rating Scale (FRS) was employed to evaluate perceived body image. This tool consists of nine gender-specific silhouette drawings arranged in ascending order of body size. Each participant was asked to select the figure that best represented their current body perception. The FRS has demonstrated acceptable test-retest reliability, with coefficients of 0.72 for boys and 0.78 for girls (11,12). To determine actual body image, height was measured using a measuring tape, and weight was recorded with a digital weighing scale. These measurements were then used to calculate Body Mass Index (BMI) for categorizing weight status. The data collection instrument was divided into two sections: Part A gathered demographic information, while Part B included the FRS for perceived body image assessment. All procedures were carried out under standardized conditions. Data were analyzed using SPSS version 21. Descriptive statistics were used to summarize demographic data, while Cohen's Kappa statistic was employed to assess the level of agreement between perceived and actual body image, indicating the degree of alignment between subjective perception and objective measurement (13).

RESULTS

The study included 300 participants with a mean age of 32.94 years (SD ±15.11), ranging from 18 to 98 years. The average body mass index (BMI) was 25.51 (SD ±5.62), with values ranging between 13.6 and 50.1. Among the participants, 47.5% were male (n=143) and 52.2% were female (n=157). Based on actual BMI measurements, 6.0% of participants were classified as underweight, 47.3% had normal weight, 27.7% were overweight, and 19.0% were obese. In terms of perceived body image as assessed through the Figure Rating Scale, 7.7% of individuals considered themselves underweight, 39.3% perceived themselves as having normal weight, 45.0% as overweight, and 8.0% as obese. The comparison between actual BMI and self-perceived body weight demonstrated a noticeable mismatch, with 53.88% of participants accurately perceiving their weight status, while 46.12% showed misperception. The agreement between actual and perceived weight categories was statistically significant (p<0.001), but the strength of agreement was weak with a Cohen's Kappa value of 0.363. Underweight individuals had a correct self-perception rate of 55.6%, while only 62.7% of individuals with normal BMI correctly identified themselves as normal weight. Notably, 70.2% of obese participants perceived themselves as overweight rather than obese, indicating a trend toward underestimation of body weight.

When stratified by gender, males demonstrated a slightly lower agreement (Kappa = 0.32, p<0.001) compared to females (Kappa = 0.38, p<0.001). Among males, only 45% of those classified as obese based on BMI correctly identified as obese, whereas 55% underestimated their status. Among females, 78.4% of those who were overweight by BMI considered themselves overweight, and 21.6% correctly identified as obese. A strong positive correlation was found between actual BMI and perceived body image score (r = 0.74, p<0.05), indicating that as actual body weight increased, perceived body size also tended to increase, though not always accurately. Further analysis was performed to examine perception accuracy across different age groups and residential areas. A stratified evaluation revealed that younger individuals (aged 18–30) demonstrated a higher agreement between perceived and actual body image, particularly in urban areas where agreement was noted at 58%, compared to 52% in rural areas. This accuracy decreased with age, with individuals aged 31–50 showing 50% agreement in urban areas and 44% in rural areas. The lowest agreement rates were observed in participants aged 51 years and above, with only 40% accuracy in urban and 38% in rural areas. These findings suggest that younger populations, especially those in urban settings, are more likely to accurately perceive their body weight status, while older adults and those in rural areas are at higher risk of misperception. This age-area interaction underlines the need for age-specific and geographically tailored awareness interventions to improve body image perception accuracy.

Table 1: Demographic characteristics

Variable	Minimum	Maximum	Mean	SD
Age	18.00	98.00	32.94	15.11
BMI	13.60	50.10	25.51	5.62

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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 3: 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	Total		
Underweight	10(55.6%)	13(9.2%)	0(0%)	0(0%)	23(7.7%)	0.363	<0.001
Normal	8(44.4%)	89(62.7%)	21(25.3%)	0(0%)	118(39.3%)		
Overweight	0(0%)	39(27.5%)	56(67.5%)	40(70.2%)	135(45%)		
Obese	0(0%)	1(0.7%)	6(7.2%)	17(29.8%)	24(8%)		
Total	18(100%)	142(100%)	83(100%)	57(100%)	300(100%)		

Table 4: Measure of Agreement between self-perception and reality (Gender Distribution)

Gender	Self-Image (Perception; Figure rating scale)	BMI Score (Reality)					Kappa	p-value
		Under Weight	Normal	Overweight	Obese	Total		
Male	Underweight	1(50%)	6(8.5%)	0(0%)	0(0%)	7(4.9%)	0.32	<0.001
	Normal	1(50%)	38(53.5%)	12(24%)	0(0%)	51(35.7%)		
	Overweight	0(0%)	26(36.6%)	34(68%)	11(55%)	71(49.7%)		
	Obese	0(0%)	1(1.4%)	4(8%)	9(45%)	14(9.8%)		
	Total	2(100%)	71(100%)	50(100%)	20(100%)	143(100%)		
Female	Underweight	9(56.3%)	7(9.9%)	0(0%)	0(0%)	16(10.2%)	0.38	<0.001
	Normal	7(43.8%)	51(71.8%)	9(27.3%)	0(0%)	67(42.7%)		
	Overweight	0(0%)	13(18.3%)	22(66.7%)	29(78.4%)	64(40.8%)		
	Obese	0(0%)	0(0%)	2(6.1%)	8(21.6%)	10(6.4%)		
	Total	16(100%)	71(100%)	33(100%)	37(100%)	157(100%)		

Table 5: 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

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Table 6: Agreement and Disagreement percent between actual and perceived Body weight Status

	Body Mass Index (BMI)					Total Agreement	Total Disagreement
Self-Image		Underweight	Normal	Overweight	Obese	Total	53.88%	46.12%
	Underweight	10 (55.56%)	13 (9.15%)	0 (0.00%)	0 (0.00%)	23 (7.7%)		
	Normal	8 (44.44%)	89 (62.68%)	21 (25.30%)	0 (0.00%)	118 (39.3%)		
	Overweight	0 (0.00%)	39 (27.46%)	56 (67.47%)	40 (70.18%)	135 (45%)		
	Obese	0 (0.00%)	1 (0.70%)	6 (7.23%)	17 (29.82%)	24 s(8%)		
	Total	18 (100%)	142 (100%)	83 (100%)	57 (100%)	300 (100%)		

Table 7: Subgroup Analysis: Perception Accuracy by Age Group and Area Type

Age Group	Urban (%)	Rural (%)
18–30	58	52
31–50	50	44
51+	40	38
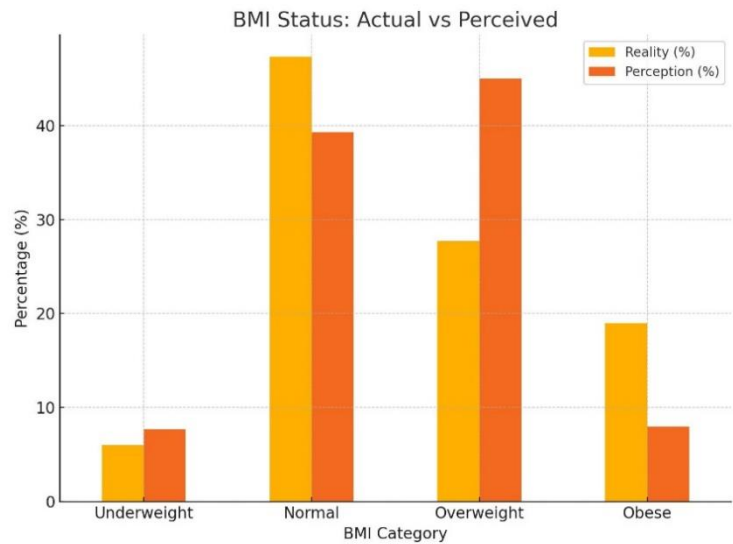
Figure 1 BMI Status: Actual vs Perceived
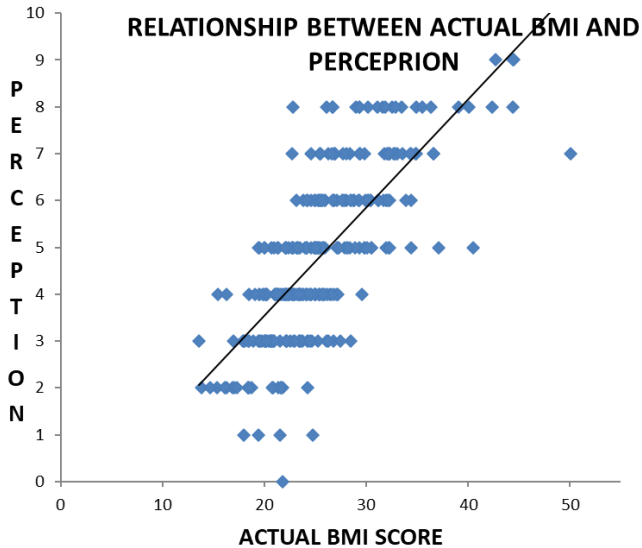
Figure 2 Relationship Between Actual BMI and Perception

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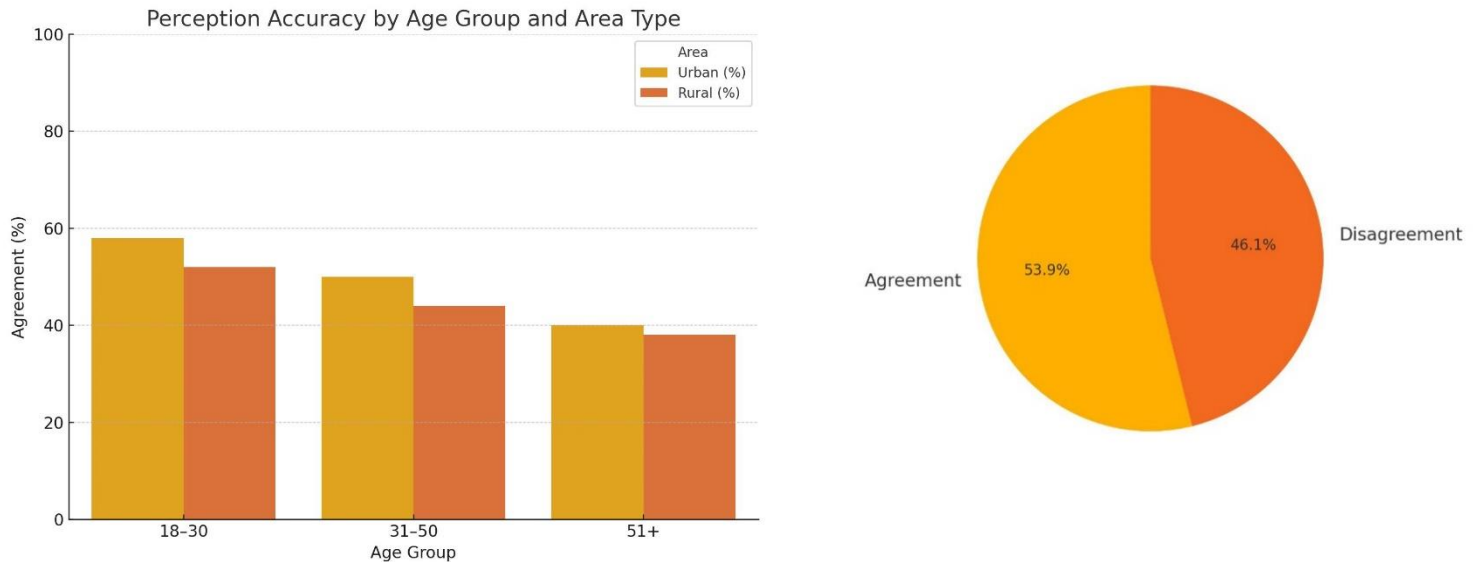AND REHABILITATION ▪ ▪ ▪

Figure 3 Perception Accuracy by Age Group and Area Type

DISCUSSION

Obesity remains a growing public health concern in modern societies, contributing significantly to the global burden of non-communicable diseases such as cardiovascular conditions, diabetes, and metabolic syndrome. This study was conducted to explore the degree of agreement between actual and perceived body image, highlighting its implications for health behaviors and weight management. The findings confirmed that individuals who misperceived their overweight status as normal were at a heightened risk for poor health outcomes due to a lack of motivation to engage in weight control practices. Conversely, those who perceived their weight status as above actual BMI were more likely to attempt weight management strategies such as dieting and physical activity, indicating a behaviorally favorable response rooted in overestimation. Among the 300 participants, 57 were classified as obese, yet only 17 individuals identified themselves as such, while the majority perceived themselves as merely overweight. This disconnect underscores the prevalence of body image underestimation among individuals with obesity and reflects a broader societal trend of desensitization to increasing body weight. The overall agreement between actual and perceived weight status was modest at 53.88%, while the disagreement rate was substantial at 46.12%. Although the agreement level was comparable to a study conducted among Korean adults, which reported a 74.9% concordance (14,15), it differed from previous investigations involving adolescents, where misperception was more widespread, and agreement was lower at 45.2% (16).

Gender-wise analysis indicated a slight difference in perception accuracy. Females demonstrated a higher agreement rate (kappa = 0.38) than males (kappa = 0.32), with a tendency to perceive their body weight more accurately. Most normal-weight females correctly categorized themselves as normal (42.7%), whereas a larger proportion of males who were normal-weight perceived themselves as overweight (49.7%). These findings support earlier research suggesting that females are generally more body-conscious and aligned in their perception with actual weight. However, the data also contradicted some earlier findings, which noted that more females tend to overestimate their weight status while males underestimate it (17,18). In the present study, females exhibited a more realistic appraisal of their body image, aligning with studies that suggest females often aim for a slimmer physique, thus reinforcing a closer link between perception and actual body mass (19-21). The highest agreement rate was observed in the overweight group (67.47%), followed by normal (62.68%), underweight (55.56%), and obese (29.82%) categories. This pattern reflects a consistent difficulty in recognizing obesity, possibly due to normalization of higher body weight within communities or psychological denial. Such misclassification has critical health implications, as individuals failing to identify their obesity status are less likely to engage in corrective behaviors (22,23). This gap in perception highlights the necessity of incorporating accurate self-assessment tools and targeted health education campaigns into public health strategies.

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Despite the valuable insights offered, the study has some limitations. The use of public spaces like parks and hotels for data collection may have introduced sampling bias, potentially excluding individuals who are homebound, less mobile, or socioeconomically disadvantaged. Additionally, the reliance on tape measures instead of stadiometers for height assessment may have affected BMI accuracy. Nevertheless, the study's strengths include a robust sample size, representation from both rural and urban populations, and the use of validated tools such as the Figure Rating Scale with known reliability. There is a pressing need for more context-specific public health interventions in Pakistan aimed at improving body weight perception accuracy. Culturally tailored health education and co-counseling strategies could bridge the gap between perception and reality, ultimately contributing to better disease prevention. Moreover, future research should incorporate longitudinal data to evaluate whether improvements in body image perception result in long-term behavioral changes and health outcomes. Inclusion of psychological and socio-cultural variables may also deepen the understanding of perceptual biases in different demographic groups. This study serves as a stepping stone for future inquiry and intervention in an area that remains under-researched in the regional context.

CONCLUSION

This study concluded that there is a considerable disconnect between individuals' perceived and actual body weight status, with many people underestimating their weight, particularly those who are overweight or obese. Such misperception poses a significant barrier to adopting healthy lifestyle changes and effectively managing weight. Enhancing awareness and promoting accurate self-perception of body image is essential for encouraging proactive health behaviors. The findings emphasize the importance of integrating targeted health education and counseling strategies into community health programs. These interventions can empower individuals to recognize weight-related health risks more accurately and take informed steps toward achieving and maintaining a healthier lifestyle.

AUTHOR CONTRIBUTION

Author	Contribution
Amina Riaz	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Nimra Fazal*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Muhammad Usman Ismail	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Qurat-ul-Ain	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Komal Iftikhar	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Adeela Mushtaq	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Hira Nawaz	Contributed to study concept and Data collection Has given Final Approval of the version to be published

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