



Obesity-related social stigma and its social, psychological, and health implications among Saudi women in clinical settings: A cross-sectional study

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ABSTRACT

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Obesity-related social stigma is increasingly recognized as a structural psychosocial determinant of health, yet empirical evidence from Middle Eastern clinical settings remains limited. This study aimed to examine the associations between obesity-related social stigma and social, psychological, and health-related implications among Saudi women attending bariatric and obesity medicine clinics in Jeddah. A cross-sectional correlational design was employed. Data were collected from 220 Saudi women with overweight or obesity ($\text{BMI} \geq 25 \text{ kg/m}^2$) attending obesity medicine clinics in two governmental hospitals in Jeddah between January and December 2025. Validated and researcher-developed scales were used to assess obesity-related stigma, negative social identity, selective social withdrawal, engagement in stigmatizing behaviors, psychological security, self-criticism, binge eating, and adoption of extreme weight-loss methods. Internal consistency reliability ranged from $\alpha = 0.766$ to $\alpha = 0.945$. Pearson correlation coefficients and multiple linear regression models with HC3 robust standard errors were estimated, controlling for BMI, age, education level, income, and employment status. Stigma was significantly and positively associated with adverse outcomes across all social, psychological, and health-related domains (all $p < 0.001$). Following adjustment for BMI and sociodemographic covariates, stigma remained a statistically significant independent predictor of all outcome dimensions, with standardized coefficients ranging from $\beta = 0.733$ to $\beta = 0.799$ and explained variance ranging from 59% to 72%. These findings indicate that obesity-related stigma functions as an independent psychosocial risk factor among Saudi women in clinical settings. Obesity-management programmes should integrate stigma-reduction strategies, psychological screening, and stigma-sensitive healthcare training alongside standard biomedical treatment.

Contribution/Originality: This study is one of the very few studies that have investigated weight-stigma consequences within Middle Eastern bariatric clinical settings. The paper's primary contribution is finding that obesity-related stigma independently predicts adverse outcomes after controlling for BMI and sociodemographic factors.

1. INTRODUCTION

Obesity is increasingly recognised not only as a biomedical condition but also as a socially embedded phenomenon shaped by cultural norms, moral judgements, and identity-related processes. Although obesity is commonly discussed in relation to its metabolic, cardiovascular, and other clinical risks, the lived experience of obesity is often shaped by social responses as much as by medical diagnosis. Body weight can function as a visible social marker through which

assumptions are made about self-discipline, personal responsibility, lifestyle, and moral worth. While such judgements may be expressed subtly, their cumulative effects can influence how individuals perceive themselves, negotiate social relationships, and position themselves within broader social contexts (Casadó-Marín & Gracia-Arnaiz, 2020; Hansen & Dye, 2018).

Accordingly, recent public health scholarship has increasingly conceptualised weight stigma not merely as a social consequence of obesity, but as an independent psychosocial risk factor with implications for mental health and health-related behaviours (Brown, Flint, & Batterham, 2022; Flint, Vázquez-Velázquez, Le Brocq, & Brown, 2025; Puhl, 2025). Existing evidence suggests that exposure to weight-based stigma is associated with heightened psychological distress, depressive symptoms, diminished self-esteem, and poorer quality of life (Westbury, Oyebode, van Rens, & Barber, 2023). Weight stigma may also undermine engagement in health-promoting behaviours by increasing emotional eating, binge eating, maladaptive weight-control practices, and avoidance of healthcare services (Levinson, Kinkel-Ram, Myers, & Hunger, 2024; Ryan et al., 2023). Rather than facilitating sustained weight management, stigma may intensify maladaptive coping strategies, reinforce negative self-evaluation, and contribute to the internalisation of devalued social identities.

Women may be particularly vulnerable to weight-related stigma because body size and appearance are often evaluated through gendered sociocultural expectations. In many societies, women's bodies are subject to heightened scrutiny, and deviations from culturally valued body norms may carry social, relational, and psychological consequences (Robstad & Fegran, 2024; Stevens, 2018). These processes may be especially salient in collectivist cultural contexts, where relational identity, family reputation, and community evaluation play central roles in shaping self-perception and social belonging (Lycorish, 2024). From a sociological perspective, stigma can be understood as a relational process through which individuals are socially devalued and positioned outside accepted norms (Giddens & Sutton, 2018). Goffman's concept of "spoiled identity" further suggests that visible bodily differences may disrupt social identity and increase pressures for impression management. In parallel, Social Identity Theory argues that membership in a negatively valued group may lead to identity negotiation, stereotype internalisation, social withdrawal, or attempts to distance oneself from the stigmatised group (Hornsey, 2008; Hu & Cheung, 2024).

Despite growing international attention to weight stigma, much of the existing empirical evidence has been generated in North American and European contexts. These studies have contributed important theoretical frameworks and measurement approaches, but they may not fully capture the cultural meanings, relational dynamics, and gendered expectations surrounding body weight in Middle Eastern societies. In Saudi Arabia, women often navigate closely connected family networks and community-based social expectations, within which body size may carry particular social significance. Comments or judgments about weight may therefore be communicated, interpreted, and internalised through culturally specific relational pathways. However, empirical research examining obesity-related stigma among women attending clinical obesity services in Saudi Arabia remains limited. This gap is particularly important because clinical settings are not only sites of biomedical treatment but also spaces where stigma may shape psychological security, healthcare engagement, eating behaviours, and the adoption of weight-loss strategies.

To address this gap, the present study examines the associations between obesity-related social stigma and social, psychological, and health-related outcomes among Saudi women attending bariatric and obesity medicine clinics in Jeddah. Specifically, the study investigates whether perceived obesity-related stigma is associated with negative social identity, selective social withdrawal, engagement in stigmatizing behaviours, psychological insecurity, self-criticism, binge eating, and the adoption of extreme weight-loss methods. It further assesses whether stigma predicts these outcomes independently of BMI and key sociodemographic characteristics. By situating obesity-related stigma within both clinical and sociocultural contexts, this study contributes to a more context-sensitive understanding of obesity management and psychosocial health among Saudi women.

The remainder of this paper is organised as follows. Section 2 presents the theoretical framework and reviews the relevant literature. Section 3 describes the study design, sampling strategy, measures, and analytical procedures. Section 4 reports the correlation and regression results. Section 5 discusses the findings in relation to existing theoretical and empirical evidence. Section 6 concludes by outlining the practical implications, limitations, and directions for future research.

1.1. Problem Statement

Obesity remains a major public health concern worldwide and in Saudi Arabia. National and international estimates have consistently shown substantial levels of overweight and obesity among Saudi adults. The Saudi Health Information Survey reported an obesity prevalence of 28.7% in 2013, while the World Health Organization estimates indicated rates of 33% in 2014 and 35% in 2018. More recent national figures show that 23.1% of individuals aged 15 years and older are classified as obese, whereas 45.1% are classified as overweight. These figures suggest that obesity in Saudi Arabia represents a sustained health and social challenge rather than a transient epidemiological pattern.

Although the biomedical consequences of obesity have been extensively examined, its social and psychological implications have received comparatively less empirical attention in Saudi clinical contexts. Existing studies from other settings have linked weight-based stigma to psychological distress, disordered eating, reduced self-esteem, and avoidance of healthcare services. However, these outcomes are often examined separately, and relatively few studies have integrated social identity, psychological security, and health-related behavioural responses within a single analytical framework. This gap is particularly important for women attending obesity medicine and bariatric surgery clinics, as clinical encounters may be shaped not only by biomedical treatment needs but also by prior experiences of judgement, exclusion, and internalised stigma.

A further conceptual issue concerns the distinction between body weight as a physiological indicator and stigma as a social experience. While BMI reflects body size and weight status, obesity-related stigma reflects the social meanings, judgments, and relational consequences attached to body size. It therefore remains important to determine whether the social, psychological, and health-related implications associated with stigma persist after accounting for BMI and relevant sociodemographic characteristics. Clarifying this distinction can strengthen both theoretical understanding and the development of stigma-sensitive interventions in obesity care.

Accordingly, the present study addresses the following research question.

What are the social, psychological, and health-related implications of obesity-related social stigma among Saudi women with overweight or obesity attending clinical obesity services, and do these implications remain significant independently of BMI and sociodemographic factors?

1.2. Significance of the Study

This study contributes to the literature in several ways. First, it adopts an interdisciplinary perspective by integrating sociological and social-psychological approaches to obesity-related stigma. By linking stigma theory, social-identity processes, psychological security, and health-related behaviours, the study provides a more comprehensive framework for understanding the consequences of obesity-related stigma among women in clinical settings.

Second, the study offers context-specific empirical evidence from Saudi Arabia, where obesity, gendered body expectations, family relations, and community evaluation may interact in culturally specific ways. Most existing evidence on weight stigma has been generated in Western contexts; therefore, examining these relationships in Saudi clinical settings can broaden the cultural relevance of obesity stigma research.

Third, the findings may inform healthcare practice by highlighting the need to address stigma as part of obesity management. Understanding how stigma is associated with social withdrawal, self-criticism, psychological insecurity,

binge eating, and extreme weight-loss practices may help clinicians, psychologists, and social workers provide more sensitive and effective support for women receiving obesity-related care.

Fourth, the study has practical implications for families, healthcare institutions, and public health authorities. By demonstrating the potential harms of obesity-related stigma, the findings may support the development of awareness programmes, stigma-reduction interventions, and healthcare training aimed at reducing blame-based or shame-based responses to obesity.

1.3. Objectives of the Study

The present study aims to examine the social, psychological, and health-related implications of obesity-related social stigma among Saudi women with overweight or obesity attending obesity medicine and bariatric surgery clinics. Specifically, the study seeks to:

1. Examine the association between obesity-related social stigma and social outcomes, including negative social identity, selective social withdrawal, and engagement in stigmatizing behaviours.
2. Assess the association between obesity-related social stigma and psychological outcomes, including psychological insecurity and self-criticism.
3. Investigate the association between obesity-related social stigma and health-related behavioural outcomes, including binge eating and the adoption of extreme weight-loss methods.
4. Determine whether obesity-related social stigma predicts these outcomes independently of BMI and sociodemographic characteristics.

1.4. Study Hypotheses

Based on the theoretical framework and previous empirical evidence, the study proposes the following hypotheses.

H₁: Obesity-related social stigma is positively associated with adverse social outcomes, including negative social identity, selective social withdrawal, and engagement in stigmatizing behaviours among Saudi women with overweight or obesity.

H₂: Obesity-related social stigma is positively associated with adverse psychological outcomes, including psychological insecurity and self-criticism among Saudi women with overweight or obesity.

H₃: Obesity-related social stigma is positively associated with adverse health-related behavioural outcomes, including binge eating and the adoption of extreme weight-loss methods among Saudi women with overweight or obesity.

H₄: Obesity-related social stigma remains a significant independent predictor of social, psychological, and health-related outcomes after controlling for BMI and sociodemographic characteristics.

1.5. Study Delimitations

This study was delimited to women with overweight or obesity who attended obesity medicine and bariatric surgery clinics in two governmental hospitals in Jeddah, Saudi Arabia: King Fahd Hospital and King Abdullah Hospital. The study sample consisted of 220 Saudi women aged 15 years and older with a BMI of 25 kg/m² or above.

The study was also temporally delimited to data collected between 1 January 2025 and 31 December 2025. Each participant completed the questionnaire once during clinic attendance, consistent with the cross-sectional design. Therefore, the findings should be interpreted as reflecting associations between obesity-related stigma and selected social, psychological, and health-related outcomes, rather than causal relationships.

1.6. Key Concepts of the Study

For conceptual and analytical clarity, several key concepts used in this study are defined operationally. Social stigma refers to a relational process through which individuals are labeled, devalued, excluded, or denied full social acceptance because they are perceived to differ from socially accepted norms. In the context of this study, obesity-

related social stigma refers to direct or indirect statements, behaviors, gestures, or social interactions that communicate mockery, sarcasm, contempt, blame, exclusion, or negative judgment toward women because of their body size or weight status. This concept specifically refers to stigma experienced by Saudi women aged 15 years and older with overweight or obesity who were attending obesity medicine and bariatric surgery clinics in governmental hospitals in Jeddah.

Obesity was defined using Body Mass Index, calculated as weight in kilograms divided by height in metres squared. Participants with a BMI of 25.0–29.9 kg/m² were classified as having overweight, whereas those with a BMI of 30.0 kg/m² or above were classified as having obesity. This classification was used to determine eligibility for inclusion in the study.

In this study, the implications of obesity-related social stigma refer to the social, psychological, and health-related responses associated with exposure to stigma. Social implications include negative social identity, selective social withdrawal, and engagement in stigmatizing behaviours toward others with obesity. Psychological implications include reduced psychological security and self-criticism. Health-related behavioural implications include binge eating and the adoption of extreme weight-loss methods. These domains were examined as outcome variables to assess whether obesity-related social stigma is associated with adverse consequences among Saudi women with overweight or obesity.

2. THEORETICAL FRAMEWORK AND RESEARCH GAPS

Recent scholarship increasingly conceptualizes weight stigma as a structural and psychosocial determinant of health rather than merely as an interpersonal form of prejudice (Brown et al., 2022; Puhl, 2025). Weight stigma refers to negative attitudes, stereotypes, and discriminatory behaviors directed toward individuals on the basis of body weight. These experiences may occur across family settings, healthcare institutions, workplaces, educational environments, and digital platforms, indicating that obesity-related stigma is embedded in both everyday social interactions and broader institutional contexts. Systematic reviews have shown that weight stigma is associated with adverse psychological outcomes, including depression, anxiety, diminished self-esteem, and internalized self-criticism (Lengton, Schoenmakers, Penninx, Boon, & van Rossum, 2025; Westbury et al., 2023). However, the effects of stigma are not uniform across contexts. For example, while Westbury et al. (2023) documented strong associations between stigma and depression across diverse populations, Brown et al. (2022) emphasized that stigma effects vary according to the institutional and relational contexts in which they occur. Hansen and Dye (2018) further showed that identity-based stigma may persist even after weight loss, suggesting that stigma operates through durable processes of labelling and social interpretation rather than being resolved through biomedical intervention alone. This challenges weight-centric healthcare assumptions that weight reduction necessarily removes the psychosocial burden associated with obesity.

Stigma is also closely connected to social identity formation and identity management. From Goffman's perspective, visible bodily differences may produce a "spoiled identity," whereby individuals become socially marked and are required to manage how they are perceived by others. In the context of obesity, body weight may become a visible attribute through which assumptions about discipline, morality, responsibility, and self-control are socially produced. These assumptions can shape how individuals understand themselves and how they participate in social life. Stevens (2018), for example, found that students with obesity were reluctant to use campus healthcare services because they anticipated judgement, supporting the argument that stigma may be intensified in settings where bodily visibility and institutional evaluation are highly salient. Similarly, Hansen and Dye (2018) and Garcia et al. (2024) reported that individuals who had undergone bariatric surgery often concealed their surgical status because they expected continuing negative judgements, such as being perceived as lazy or lacking self-control. These findings indicate that obesity-related stigma may continue to affect identity even when individuals engage in medical or surgical weight-management strategies.

Social Identity Theory provides a further explanation for how stigma may influence social behavior. Individuals who perceive themselves as members of a negatively evaluated group may internalize negative stereotypes, withdraw from broader social participation, seek alternative identity groups, or attempt to distance themselves from the stigmatized category (Chapman, Spence, Hornsey, & Dixon, 2025; Hornsey, 2008; Hu & Cheung, 2024). Casadó-Marín and Gracia-Arnaiz (2020) illustrated how online communities may function as spaces in which individuals renegotiate obesity-related identity and resist dominant stigmatizing narratives. However, stigma does not operate in isolation from other identity dimensions. Gender, cultural expectations, family structures, and community norms may shape how obesity-related stigma is expressed and internalized. Kuroki (2017) found that women are particularly affected by stigma when labelled as obese, while Al-Ruwaibea (2018) showed that individuals with morbid obesity in Middle Eastern contexts may experience intense social pressure from family and relational networks. These findings are especially relevant to Saudi women, whose experiences of body weight may be shaped by gendered expectations, family evaluation, and community-based social norms.

A substantial body of research has also linked perceived weight-based discrimination and internalized stigma to psychological distress. Jung, Spahlholz, Hilbert, Riedel-Heller, and Luck-Sikorski (2017) reported that perceived weight discrimination was associated with greater discrepancy between actual and desired weight, more extreme weight-loss goals, and higher body dissatisfaction, particularly among women and individuals with higher BMI. Carels, Rossi, Solar, and Selensky (2019), using ecological momentary assessment, found that daily stigma experiences were associated with depressive mood, shame, and binge eating. Lillis, Luoma, Levin, and Hayes (2010) further identified internalized weight stigma, often expressed as self-criticism about one's weight, as a key mechanism through which repeated experiences of devaluation erode psychological well-being. More recently, Puhl (2025) emphasized that weight stigma functions as a chronic social stressor with cumulative effects on psychological health. Together, these studies suggest that obesity-related stigma may influence psychological outcomes not only through direct exposure to negative judgment, but also through the internalization of stigmatizing meanings.

Weight stigma also has important implications for health-related behaviors. Although public discourse sometimes assumes that stigma may motivate healthier behavior, empirical evidence generally suggests the opposite. Levinson et al. (2024) found that weight stigma is strongly associated with disordered eating cognitions and binge-eating behaviors, while Jung et al. (2017) linked weight-based discrimination to more extreme weight-loss goals and greater body dissatisfaction. These studies point to related but distinct mechanisms. Some evidence emphasizes internalized stigma as the pathway through which individuals develop maladaptive eating patterns, whereas other findings highlight externally perceived discrimination as a driver of extreme weight-control behaviors. Stigma has also been linked to avoidance of healthcare. Ryan et al. (2023) and Puhl (2025) showed that anticipated stigma within healthcare settings may reduce patients' willingness to seek, continue, or fully engage with medical care. Rather than supporting sustainable weight management, stigma may therefore function as a chronic stressor that increases psychological distress, undermines healthcare engagement, and contributes to health-risk behaviors.

Despite growing international evidence on obesity-related stigma, several important gaps remain. Much of the existing literature examines single outcome domains, such as depression, healthcare avoidance, or disordered eating, without integrating social identity processes, psychological security, and health-related behaviors within a unified analytical framework. In addition, most empirical evidence has been generated in North American and European contexts, which may limit its applicability to Middle Eastern societies where family relations, gendered expectations, and community evaluation may play a stronger role in shaping stigma experiences. Another unresolved issue concerns whether the effects of stigma persist independently of BMI and sociodemographic factors. This distinction is important because BMI reflects physiological body size, whereas stigma reflects the social meanings and relational consequences attached to body weight.

The present study addresses these gaps by examining obesity-related social stigma among Saudi women attending obesity medicine and bariatric surgery clinics in Jeddah. It situates stigma within a multidimensional

framework that links social identity, psychological security, and health-related behavioral outcomes. Specifically, the study examines whether obesity-related stigma is associated with negative social identity, selective social withdrawal, engagement in stigmatizing behaviors, psychological insecurity, self-criticism, binge eating, and the adoption of extreme weight-loss methods. It further assesses whether stigma predicts these outcomes after controlling for BMI and key sociodemographic characteristics. By doing so, the study contributes context-specific evidence from a Saudi clinical population and advances a more culturally sensitive understanding of obesity-related stigma as an independent psychosocial risk factor.

Based on stigma theory and Social Identity Theory, this study proposes that obesity-related social stigma may contribute to adverse social, psychological, and health-related outcomes. Stigma is expected to weaken social identity, increase social withdrawal, intensify self-criticism, reduce psychological security, and contribute to maladaptive health-related behaviors. The hypothesized relationships guiding the empirical analysis are presented in Figure 1.

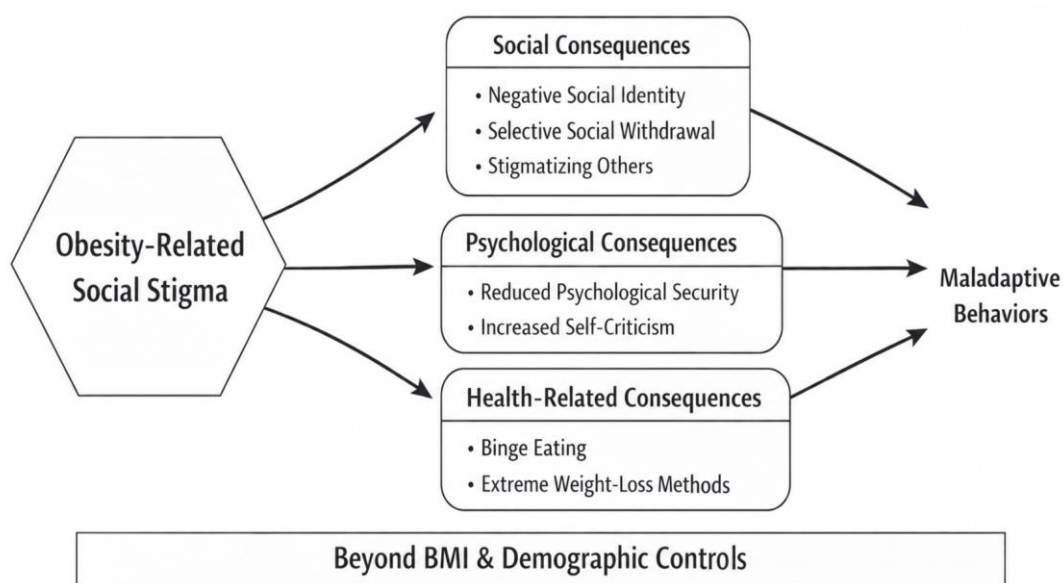


Figure 1. Conceptual framework of obesity-related social stigma and its multidimensional implications.

3. MATERIALS AND METHODS

3.1. Study Design and Setting

This study adopted a cross-sectional correlational design to examine the associations between obesity-related social stigma and its social, psychological, and health-related implications among Saudi women attending obesity medicine and bariatric surgery clinics. The design was intended not only to assess bivariate associations between stigma and outcome variables, but also to determine whether stigma remained independently associated with adverse outcomes after accounting for BMI and key sociodemographic characteristics.

The study was conducted in two governmental hospitals in Jeddah, Saudi Arabia, namely King Fahd Hospital and King Abdullah Hospital. Both hospitals provide obesity medicine and bariatric surgery services under the Saudi Ministry of Health and represent high-volume public-sector clinical settings for obesity-related care.

3.2. Participants and Sampling

The target population comprised women attending obesity medicine and bariatric surgery clinics between January 2025 and December 2025. During the data collection period, 661 women were identified as eligible to participate. A clinic-based consecutive non-probability sampling approach was used, whereby all eligible women attending the selected clinics were invited to complete the questionnaire.

The final analytical sample consisted of 220 Saudi women with overweight or obesity, corresponding to an approximate response rate of 33%. BMI data were available for 215 participants. Eligible participants were female, aged 15 years or older, attending obesity medicine or bariatric surgery clinics, and had a BMI of 25 kg/m² or above. Participants were excluded if their questionnaires had more than 20% missing responses or if their clinic visit was not related to obesity care.

Although participation was voluntary, several factors may have affected the response rate, including time constraints, hospitalization procedures, literacy limitations, and concerns about completing digital survey links. These factors were documented as potential sources of nonresponse bias.

3.3. Measures

Data were collected using a structured questionnaire comprising validated scales and researcher-developed instruments. The questionnaire assessed obesity-related social stigma as the independent variable and three groups of outcome variables: social implications, psychological implications, and health-related behavioral implications.

As shown in Table 1, Obesity-related social stigma was measured using a 16-item scale developed for this study to assess perceived direct and indirect stigma experiences among Saudi women with overweight or obesity. Items were rated on a five-point Likert-type scale ranging from 1 = never to 5 = always, with higher scores indicating greater perceived stigma. The scale demonstrated excellent internal consistency reliability, with Cronbach's alpha of 0.945.

Social implications were assessed through three subdimensions: Negative social identity, selective social withdrawal, and engagement in stigmatizing behaviors toward other women with overweight or obesity. Negative social identity was measured using a 14-item scale assessing distorted social self-perception resulting from stigma exposure. Selective social withdrawal and engagement in stigmatizing behaviors were assessed using researcher-developed items. A composite social implications score was calculated from the three subscales, with higher scores indicating more adverse social consequences. The overall internal consistency for this domain was good, with Cronbach's alpha of 0.859.

Psychological implications were assessed through two subdimensions: psychological security and self-criticism. Psychological security was adapted from Shuqair (2005) scale and assessed feelings of emotional reassurance, belonging, and social acceptance. Self-criticism, or weight-related self-stigma, was adapted from Lillis et al. (2010) and assessed the internalization of negative weight-related evaluations. A composite psychological-implications score was computed from these subscales, with higher scores indicating greater psychological distress. The internal consistency for this domain was excellent, with Cronbach's alpha of 0.915.

Health-related behavioral implications were assessed through binge eating and the adoption of extreme weight-loss methods. Binge eating was measured using a five-item scale based on Abdul Nabi, assessing the frequency and severity of binge-eating episodes. Adoption of extreme weight-loss methods was measured using six researcher-developed items assessing potentially harmful weight-control practices. A composite health-related-implications score was calculated from the two subscales, with higher scores indicating greater health-risk behaviors. The internal consistency for this domain was good, with Cronbach's alpha of 0.864.

All scales used Likert-type response formats, and higher scores indicated a greater presence of the measured construct.

Table 1. Measurement framework of the study.

Construct	Role in analysis	Subdimensions / Indicators	Number of items	Reliability
Obesity-related social stigma	Independent variable	Direct and indirect stigma experiences	16	$\alpha = 0.945$
Social implications	Dependent variable	Negative social identity; selective social withdrawal; engagement in stigmatizing behaviors	19	$\alpha = 0.859$
Psychological implications	Dependent variable	Psychological security; self-criticism / Weight self-stigma	9	$\alpha = 0.915$
Health-related behavioral implications	Dependent variable	Binge eating; adoption of extreme weight-loss methods	11	$\alpha = 0.864$
Binge eating	Subscale	Frequency and severity of binge eating episodes	5	$\alpha = 0.817$
Extreme weight-loss methods	Subscale	Potentially harmful weight-control practices	6	$\alpha = 0.766$

3.4. Covariates and Reliability Assessment

To estimate the independent association between obesity-related social stigma and the study outcomes, several covariates were included in the adjusted analyses. These included BMI, age, education level, income level, and employment status. BMI was treated as a continuous variable in the regression models.

Internal consistency reliability was assessed using Cronbach's alpha. Across the study scales and subscales, alpha coefficients ranged from 0.766 to 0.945, indicating acceptable to excellent reliability. These values suggest that the measures demonstrated adequate internal coherence without evidence of problematic redundancy.

3.5. Data Collection and Ethical Considerations

Data were collected after obtaining ethical approval from the Saudi Ministry of Health and institutional permission from both participating hospitals. Questionnaires were administered in designated waiting areas of the obesity medicine and bariatric surgery clinics. Before participation, eligible women were informed about the purpose of the study, the voluntary nature of participation, confidentiality protections, and their right to withdraw at any time without any effect on their medical care. Written informed consent was obtained from all participants before questionnaire completion.

To protect participant privacy, no personally identifying information was collected. All responses were anonymized and used only for research purposes. The study procedures were conducted in accordance with relevant ethical requirements for research involving human participants.

3.6. Statistical Analysis

Data were analyzed using SPSS version 26. Descriptive statistics, including means and standard deviations, were used to summarize the characteristics of the sample and the main study variables. Pearson correlation coefficients were then calculated to examine bivariate associations between obesity-related social stigma and each social, psychological, and health-related outcome.

Multiple linear regression models were estimated to assess whether obesity-related social stigma independently predicted adverse outcomes after adjusting for BMI and sociodemographic covariates, including age, education level, income level, and employment status. Because the study used a clinical convenience sample and homoskedasticity could not be assumed, regression models were estimated using HC3 heteroskedasticity-robust standard errors. This approach provides more conservative and reliable statistical inference when error variance may be unequal across observations.

For each outcome, the regression model was specified as follows:

$$Y = \beta_0 + \beta_1(Stigma) + \beta_2(BMI) + \beta_3(Age) + \beta_4(Education) + \beta_5(Income) + \beta_6(Employment) + \varepsilon \quad (1)$$

Where Y represents the outcome variable, including the social implications composite score, psychological implications composite score, or health-related implications composite score. The coefficient β_1 represents the independent association between obesity-related social stigma and each outcome after adjustment for BMI and sociodemographic factors. The residual term is represented by ε .

Before model estimation, multicollinearity diagnostics were examined using variance inflation factors and tolerance statistics. Residual plots were also inspected to assess the assumptions of linearity and variance stability. All findings from the regression analyses were interpreted as associations rather than causal effects because of the cross-sectional design.

3.7. Validity, Reliability, and Bias Control

The validity of the study instruments was assessed through expert review. Specialists evaluated the relevance, clarity, and appropriateness of the questionnaire items, and their recommendations regarding item deletion, addition, or modification were incorporated before the final version of the questionnaire was administered.

Reliability was assessed using Cronbach's alpha coefficient. A preliminary reliability assessment was conducted with 30 women attending obesity medicine and bariatric surgery clinics who agreed to participate. Across the study scales and subscales, Table 2 reports the Cronbach's alpha coefficients, which indicate acceptable to excellent internal consistency, supporting the reliability of the instruments used in the study.

Given the clinic-based sampling strategy and voluntary participation, the possibility of self-selection bias cannot be fully excluded. Some eligible women may have declined participation because of time constraints, hospitalization procedures, literacy limitations, or concerns about completing digital survey links. To reduce potential confounding, all adjusted regression models controlled for BMI and key sociodemographic characteristics. Nevertheless, the findings should be interpreted with caution and understood as reflecting statistically adjusted associations within a clinical sample rather than population-level causal relationships.

Table 2. Internal Consistency of Study Scales.

Scale	Items	Cronbach's α
Obesity-related social stigma	16	0.945
Social identity	14	0.828
Social dimension (Composite)	19	0.859
Psychological implications	9	0.915
Binge eating	5	0.817
Extreme methods	6	0.766
Health-related implications (Composite)	11	0.864

3.7.1. Reliability Analysis

All instruments demonstrated acceptable to excellent internal consistency (α range = 0.766–0.945), supporting scale aggregation and subsequent inferential analyses.

3.7.2. Statistical Methods Used to Analyze the Study Data

Table 3 summarizes the means and SD of the core study variables. The data collected were analyzed using the SPSS statistical software. The program was used to analyze the results of the study scales. Cronbach's alpha and the split-half method were used to test the reliability of the study instruments. Pearson's correlation coefficient was used to determine statistical significance, and the arithmetic mean and standard deviation were used for the study scales.

Table 3. Descriptive Statistics of Core Study Variables (N = 220).

Variable (Higher scores indicate higher levels of the construct)	N	Mean	SD
Obesity-related social stigma	220	3.08	1.08
Social identity	220	3.41	0.74
Selective social withdrawal	220	2.64	1.38
Engagement in practicing stigma	220	2.04	1.16
Social dimension (Composite)	220	3.20	0.72
Psychological implications (Composite)	220	2.93	1.13
Binge eating	220	2.95	1.13
Extreme weight-control methods	220	2.72	0.96
Health-related implications (Composite)	220	2.83	0.94
BMI	215	29.51	5.48

4. RESULTS

4.1. Descriptive Statistics

Participants reported moderate levels of perceived obesity-related stigma and corresponding moderate levels of social, psychological, and health-related implications. Variability indices indicate substantial dispersion across participants, supporting the suitability of correlational and regression modeling.

4.2. Hypothesis Testing

4.2.1. Hypothesis 1

H₁: Obesity-related social stigma is positively associated with the social dimension (social identity, selective withdrawal, and engagement in practicing stigma).

Table 4. Correlations Between Stigma and Social Dimension Components.

Outcome Variables	N	r	p
Social identity	220	0.764	< 0.001
Selective social withdrawal	220	0.730	< 0.001
Practicing stigma	220	0.438	< 0.001
Social dimension (Composite)	220	0.816	< 0.001

Table 4 reports that stigma exhibited strong positive associations with social identity and selective withdrawal, and a moderate association with engagement in practicing stigma. The composite social dimension demonstrated a very strong correlation ($r = 0.816$), indicating that higher perceived stigma is systematically linked to heightened adverse social processes. Hypothesis 1 is strongly supported.

4.2.2. Hypothesis 2

H₂: Obesity-related social stigma is positively associated with psychological implications.

Table 5. Correlation Between Stigma and Psychological Implications.

Outcome Variable	N	r	p
Psychological implications (Composite)	220	0.734	< 0.001

Table 5 shows a strong positive correlation ($r = 0.734$) between stigma and psychological implications, suggesting that increased stigma is robustly associated with diminished psychological well-being. Hypothesis 2 is supported.

4.2.3. Hypothesis 3

H₃: Obesity-related social stigma is positively associated with health-related implications (binge eating and extreme weight-control methods).

Table 6. Correlations Between Stigma and Health-Related Outcomes.

Outcome Variables	N	r	p
Binge eating	220	0.686	< 0.001
Extreme weight-control methods	220	0.699	< 0.001
Health-related implications (Composite)	220	0.761	< 0.001

Table 6 indicates that binge eating and extreme weight-control behaviors were both found to be strongly positively associated with obesity-related stigma. Compared to other health-related outcomes, the composite health dimension ($r = 0.761$) had the strongest correlation with stigma score, further indicating that stigma has a systemic impact on maladaptive health-related behaviors. Thus, Hypothesis 3 is supported.

4.2.4. Multiple Regression Analysis

To evaluate whether stigma predicts social, psychological, and health outcomes beyond BMI and sociodemographic characteristics, we estimated multiple regression models with heteroskedasticity-robust standard errors (HC3).

Covariates included:

- BMI.
- Age category.
- Education level.
- Economic level.
- Employment status.

Table 7. Multiple Regression Models Predicting Outcome Dimensions from Stigma and Covariates (Adjusted Models, N = 215).

Dependent Variables	N	R ²	Adj. R ²	b (Stigma)	Robust SE	β	95% CI	p
Social dimension (Composite)	215	0.724	0.699	0.532	0.029	0.799	0.475, 0.589	0.001
Psychological implications	215	0.592	0.554	0.744	0.049	0.733	0.648, 0.841	0.001
Health-related implications	215	0.654	0.623	0.643	0.038	0.749	0.569, 0.718	0.001

Table 7 reports that, following adjustment for BMI and sociodemographic covariates, the association of stigma with all outcomes was statistically significant. Standardized coefficients were all large ($\beta \approx 0.73$ – 0.80), and explained variance ranged from 59% to 72%, which indicates that stigma represents a dominant explanatory correlate of negative social, psychological, and health outcomes in our analytical sample.

4.2.5. Integrated Summary of Findings

Obesity-related stigma was strongly and consistently associated with negative social functioning, psychological distress, and maladaptive health-related behaviors across descriptive, reliability, correlational, and multivariable analyses; these associations remained statistically significant after controlling for body mass index (BMI) and sociodemographic factors; thus, obesity-related stigma appears to be a central, independent correlate of multidimensional impairment in Saudi women with overweight or obesity attending obesity clinics.

5. DISCUSSION

The current study explored the relationship between obesity-related social stigma and its social, psychological, and health-related implications among Saudi women with overweight or obesity who attend Jeddah's bariatric and obesity treatment clinics. The results provide strong, empirical support for the conceptual model of the study, indicating that social stigma is significantly positively associated with negative outcomes across all domains studied.

Correlational analyses demonstrated significant positive associations between obesity-related stigma and negative social identity; selective social withdrawal; engagement in stigmatizing attitudes toward other women with overweight or obesity; decreased psychological security; increased self-criticism; and binge-eating disorder and extreme weight-control behaviors. Additionally, the results from multiple regression analyses utilizing HC3 robust standard-error estimates indicated that stigma remained a significant predictor of all measured outcomes when BMI and other key sociodemographic variables were controlled for. This indicates that these psychological and behavioral consequences cannot be solely attributed to body mass index (BMI) or sociodemographic characteristics, but rather are independently associated with experienced stigma.

These findings significantly enhance the theoretical and empirical contribution of the study.

5.1. *Social Identity and Withdrawal: A Goffmanian Interpretation*

The strong association between obesity-related stigma and negative social identity supports (Goffman, 1963) conceptualization of stigma as a spoiled identity. Women reporting higher stigma exposure were more likely to internalize a devalued social identity, supporting the view that stigma is not only an external label but a socially constructed identity framework that reshapes self-perception (Thornicroft et al., 2022).

Within the Saudi sociocultural context, physical appearance, femininity, and social presentation carry substantial symbolic significance, which is likely to magnify the apparent disconnect between the “virtual identity” and “actual social identity.” Since being obese is visible, it is conceptualized as a discredited stigma according to Goffman's typology, which increases the likelihood of identity-based tension in face-to-face interactions.

The act of selectively withdrawing from society likely serves as a protective adaptation mechanism aimed at reducing exposure to stigmatizing environments. Withdrawing from social interaction does not necessarily reflect dispositional introversion; rather, it represents a strategic effort to limit exposure to anticipated stigma. This interpretation aligns with Puhl (2025) observation that anticipated stigma—not only experienced stigma—drives avoidance behaviors, suggesting a proactive rather than purely reactive process. Importantly, this finding partially contrasts with Ryan et al. (2023), who reported that withdrawal was most pronounced within healthcare settings rather than general social contexts. The present study's clinical recruitment setting may therefore have contributed to elevated withdrawal scores, a methodological consideration that warrants attention in future comparative studies.

5.2. *Internalization and Self-Criticism*

Research shows a strong correlation between self-criticism and stigma. When a person has been repeatedly devalued externally, they are more likely to internalize external devaluation. Stigma was not limited to interpersonal social consequences but also manifested as self-directed negative evaluation. This process can be analyzed using Social Identity Theory; when the person's group membership is seen as negative and becomes salient, they will engage in collective defense or adopt the dominant negative narrative. The findings also indicate that many individuals internalize weight-related stigma, given that it is problematized within medical discourse, so there are both medical and social contexts that may reinforce internalization.

Importantly, the regression results indicate that stigma predicts self-criticism independently of BMI, demonstrating that psychological harm is not determined by body size alone but by the social meaning attributed to body weight. This finding extends Lillis et al. (2010) argument that internalized stigma is the primary mechanism through which repeated devaluation erodes psychological well-being and is further corroborated by Puhl (2025), who

identifies internalization as the critical mediating pathway between social stigma and psychological distress. However, a contrasting perspective is offered by Brown et al. (2022), who suggest that not all individuals exposed to stigma develop internalized self-criticism, pointing to potential moderating factors such as social support and coping style. Future research in Saudi clinical populations should examine these moderating pathways to develop more targeted psychological interventions.

5.3. *Psychological Security*

The lowered sense of psychological security felt by participants experiencing stigma reflects the destabilizing effect of ongoing social evaluations. The three core components of psychological security include feeling emotionally supported, having a sense of belonging, and feeling accepted by others. This research showed that all three of these elements are significantly undermined by stigma.

This finding is consistent with research indicating that weight stigma is associated with increased depression, anxiety, and diminished well-being (Carels et al., 2019; Jung et al., 2017; Westbury et al., 2023). In collectivist societies, family and social networks are central to individual identity, meaning that stigma may carry an amplified destabilizing effect due to heightened relational expectations and the public visibility of body size. This interpretation is supported by Al-Ruwaibea (2018), who documented intense family-mediated social pressure among individuals with morbid obesity in the Middle Eastern region. In contrast, studies conducted in individualist Western contexts tend to emphasize peer-based and media-based stigma as primary sources of psychological insecurity, suggesting that the mechanisms through which stigma undermines psychological security may differ meaningfully across cultural settings, a distinction that has significant implications for culturally adapted intervention design.

5.4. *Health-Related Behavioral Consequences*

The most significant findings pertained to the relationship between stigma and maladaptive health behaviors. Higher levels of stigma were significantly associated with increased binge eating and also significantly greater use of extreme weight-control methods.

These associations contradict assumptions that stigma motivates healthy behavioral change. Rather, the current data support the stress-eating model, in which stigma-induced distress triggers emotional eating as a maladaptive coping mechanism. This is consistent with Levinson et al. (2024), whose systematic review found no evidence that stigma promotes adaptive eating behaviors, and with Carels et al. (2019), who documented real-time associations between daily stigma experiences and binge-eating episodes using ecological momentary assessment. However, a contrasting perspective is offered by Jung et al. (2017), who found that in some cases weight-based discrimination was associated with increased motivation to pursue weight loss, albeit through extreme rather than healthy methods. This nuance suggests that stigma may simultaneously generate both maladaptive coping and heightened weight-loss motivation, with the behavioral outcome depending on the individual's available coping resources. The use of extreme weight-loss methods may further represent an urgent attempt to escape stigmatized group membership, aligning with Tajfel and Turner (1979) notion of social mobility when group boundaries are perceived as permeable.

The persistence of these associations following adjustment for BMI in regression models confirms that the effects of stigma on maladaptive health behaviors are socially mediated rather than purely biomedical, reinforcing the conceptualization of obesity-related stigma as an independent psychosocial determinant of health.

5.5. *The Paradox of Reproduced Stigma*

One of the most remarkable findings is that experiencing stigma has a significant positive association with engaging in stigmatizing behaviors towards other women with overweight or obesity. Therefore, it appears that stigmatization is socially reproduced through the mechanism of internalization and redirection of stigma.

This phenomenon may reflect defensive distancing from a devalued identity, intragroup differentiation attempts, or the internalization of dominant societal beauty standards. Hansen and Dye (2018) observed a parallel dynamic among individuals who had undergone bariatric surgery and subsequently distanced themselves from their pre-surgery identity, suggesting that the redirection of stigma may function as an identity-management strategy. Such dynamics have been observed across various stigmatized populations and underscore the need for further qualitative exploration of how stigmatized Saudi women negotiate identity boundaries within clinical and community settings.

5.6. Theoretical Contribution

The study contributes to knowledge of stigma through the following:

1. A new integration of Goffman's stigma framework and Social Identity Theory within the clinical context of obesity care.
2. Evidence of independent predictive effects of stigma beyond BMI (Body Mass Index).
3. A collection of primary data from an underrepresented Middle Eastern cultural context in stigma research as it pertains to obesity.

The findings reinforce the conceptualization of obesity-related stigma as a multidimensional social determinant of psychological and behavioral health.

Overall, our primary findings indicated that obesity-related stigma functions as an independent psychosocial risk factor for the development of identity formation and emotional security, and for health-related behaviors among Saudi women. These effects continue to exist after adjusting for the participants' BMI, which reflects the central role of social meaning in shaping health outcomes.

Therefore, interventions addressing obesity should also consider stigma as a parallel public health concern.

6. CONCLUSIONS

This study demonstrates that obesity-related social stigma is strongly associated with adverse social, psychological, and health-related outcomes among Saudi women attending obesity medicine and bariatric surgery clinics. Women who reported higher levels of stigma were more likely to experience negative social identity, selective social withdrawal, increased self-criticism, reduced psychological security, binge eating, and the adoption of extreme weight-loss methods. These findings suggest that obesity-related stigma is not merely a secondary social experience attached to body weight, but a meaningful psychosocial factor associated with multiple dimensions of well-being and health-related behaviour.

Importantly, the associations between stigma and adverse outcomes remained statistically significant after controlling for BMI and key sociodemographic characteristics. This indicates that the implications observed in this study cannot be explained solely by body size or weight status. Rather, they appear to be shaped by the social meanings, judgments, and relational pressures attached to obesity. This finding supports a conceptual shift in obesity research and clinical practice: obesity-related stigma should not be treated as a peripheral issue, but as an independent psychosocial risk factor that may undermine psychological well-being, social participation, and adaptive health behaviors.

The findings have direct implications for obesity care in Saudi clinical settings. Medical interventions that focus only on weight reduction may be insufficient if the social and psychological dimensions of stigma remain unaddressed. Bariatric and obesity medicine services should therefore integrate stigma-sensitive care into routine clinical practice. This may include psychological screening for stigma-related distress, self-criticism, binge eating, and extreme weight-control behaviours, as well as structured training for healthcare professionals in non-stigmatizing communication. In addition, public health authorities should develop culturally appropriate awareness programmes that address weight-based discrimination, particularly family-mediated stigma and community-based judgement in collectivist social contexts.

Several limitations should be considered when interpreting the findings. First, the cross-sectional design does not allow causal inference, and the directionality of the relationships between stigma and adverse outcomes cannot be confirmed. Second, the clinic-based consecutive sampling approach and the response rate of approximately 33% may have introduced self-selection bias, as women with stronger experiences of stigma may have been more willing to participate.

Third, the use of self-reported measures may have increased the risk of social desirability bias, particularly for sensitive variables such as engagement in stigmatizing behaviours and extreme weight-loss practices. Fourth, the study was conducted in two governmental hospitals in Jeddah, which may limit the generalizability of the findings to other regions of Saudi Arabia or to private healthcare settings.

Future research should use longitudinal designs to clarify the temporal sequence between stigma exposure and subsequent social, psychological, and health-related outcomes. Structural equation modelling could also be used to examine potential mediating and moderating mechanisms, such as whether self-criticism mediates the association between stigma and binge eating, or whether social support buffers the psychological effects of stigma. Qualitative and mixed-method studies would further deepen understanding of how Saudi women experience, interpret, and respond to obesity-related stigma in both clinical and community settings. Comparative research across regions, healthcare sectors, and population groups would also help determine whether the patterns observed in this study are specific to clinical populations or reflect broader sociocultural dynamics.

Overall, this study highlights obesity-related social stigma as a significant psychosocial factor associated with identity disruption, emotional insecurity, and maladaptive health-related behaviours.

Effective obesity management should, therefore, address stigma reduction and biomedical treatment as parallel and mutually reinforcing priorities. In culturally and socially embedded contexts, reducing stigma is not only a matter of improving patient experience but also an essential component of more ethical, effective, and person-centred obesity care.

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