Original Research Article

Psychological Distress as A Predictor For Weight Self-Stigma Among Youth In Jazan Region, Saudi Arabia: A Cross-Sectional Survey

ABSTRACT

Background: Weight-related self-stigma has well-known psychological consequences. There is growing evidence that psychological problems, including depression, anxiety, stress, predict the existence of weight stigma. The purpose of the present survey was to examine the association between weight self-stigma and psychological distress among Saudi young adults in Jazan region.

Materials and Methods: We performed a cross-sectional investigation using the wight-self stigma questionnaire (WSSQ) and the depression, anxiety, and stress scale 21 (DASS 21) in a convenience sample of 399 participants. The statistical analysis included descriptive analysis, independent-samples t-test, analysis of variance (ANOVA), and linear regression.

Results: The mean age was 21.12 years ± 2.91 years. Stigmatization of oneself weight (both self devaluing and enacted stigmatization concern) was significantly associated with respondents' body mass index (BMI) ($p < .001$), depression, anxiety, and stress ($p < .001$). There was a significant correlation between respondents' scores on the WSSQ and DASS 21. The main predictors for weight self-stigma were BMI ($p < .001$) and psychological distress ($p < .001$).

Conclusion: The study revealed a strong association between weight self-stigma and psychological distress among young adults in Saudi Arabia. Further epidemiological and clinical studies on the national level are warranted.

Keywords: [Weight self-stigma, Youth, Public Health, Adolescent medicine, depression, anxiety, stress, DASS-21, Saudi Arabia }

1. INTRODUCTION

The World Health Organization identified mental health as "essential to human health" in its plan for preventing, treating, and overcoming mental health diseases [1]. Despite this, mental health disorders remain the leading cause of disability and a major public health concern around the globe due to rising in its prevailing, illness progression, and treatment challenges [2,3]. Stress, depression, and anxiety all considered as

significant psychological well-being markers that, if not treated, can affect people negatively [4,5]. Both anxiety and depression are emotive reactions which produce comparable clinical manifestations such as irritation, muscular tightness, exhaustion, and troubles falling asleep. Dissimilar to stress, which commonly brought on via outer variable and could be temporary, worry persists when there is no external stressor [6]. Reduction in excitement for everyday activities, considerable weight changes, switching in style of sleep, energy reduction, fall in focus, sense of fault or useless, and also continual ideas of dying and self-immolation are all indications of depression [7]. Public stigma and self-stigma are the two types of stigmatization. Self-stigmatization can be defined by becoming aware of public stigmatization and agreeing on its assumptions and beliefs [8]. Stigmatization of the oneself weight is described by feelings of abashment, low respect of the oneself, and discriminating in a noticeable way [9]. Weight timidity refers to the societal stigma attached to people who are overweight or obese. It frequently contains negative correlations and stereotypes that are presented in a variety of ways, leading to discrimination, social isolation, blatantly unjust treatment, unfavorable stereotypes, and discrimination [10]. Weight timidity can be divided into two main categories: felt timidity of weight and internal weight timidity [11]. In fact, depression, decreased self-regard, physiologic worry, poor diet, appearance displeasure of body, ideation of suicide, declined scholastic achievement, diabetes, and also abnormally high body mass index have all been related to the psychosocial, and academic consequences of stigmatization of oneself weight among adults [12].

Body discernment seems to be known source causing stress for youth who are overweight or obese, as they are frequently punished for their lack of health and fitness [13]. As a result, they may feel self-conscious and ashamed about their bodies, leading to depression and anxiety [14]. Participants who perceived themselves as overweight and were subjected to weight discriminating stimuli showed signs of mental distress, such as anxiety and stress [15]. Women with a high BMI were more likely to experience stress than women with a low BMI [16]. According to studies, the more often a person is subjected to weight Stigma, the more severe their depressive symptoms [17]. Moreover, according to existing evidence, Maladjusted consumption, pressure, insufficient sleeping, sedentary lifestyle, and avoiding the exercise have mostly been linked to body-based harassment [18]. In addition, depressive symptoms appear to modulate the link between weight loss stigma and self-reported physical health, according to Pearl et al. [19]. Also, The Stigma attached to one's weight was already described to be known cause of pressure [20,21]. Those who considered themselves to be above the normal weight average and were subjected to body discrimination triggers, such as anxiety and stress, displayed psychiatric discomfort (psychiatric discomfort is described as chain of perplexing, upsetting, exceptional backgrounds and manifestations of private internal liveliness) [14]. Additionally, Major et al. discovered that women with a high BMI who were subjected to weight stigma were more likely to experience stress than women who were not subjected to weight stigma [15].

A variety of stimuli or strains may cause stress, and the body responds predictably [21]. Also, Adolescents who are bullied because of their weight can experience stress and depression, leading to sleep problems. Furthermore, The relationship between stigmatization of oneself weight and personal-described bodily wellness is mediated by depression manifestations according to Pearl et al. [18]. The overweight and obesity, according to WHO criteria in Saudi Arabia, has a high prevalence, especially among Saudi females [22]. However, there is insufficient research on adolescent mental health in the area. Still, one study shows that the boys aged 15- 18 years in Abha city reported that 38.2% suffer from depression, whenever 48.9% suffer from anxiety, and 35.5% suffer from stress [23]. So, we want to investigate the correlation between weight self-stigmatization and psychological distress in young people In Jazan region, Saudi Arabia.

2. Methods

1. 1.1. Study design and method of sampling

A cross-sectional survey was conducted between 3 August and 1 September, 2021. A convenience random method of sampling was applied.

1. 1.2. Study sample size and participants

To achieve 95% confidence interval, margin of error not exceeding 5%, and 20% nonresponse rate, a sample of 440 participants was determined for the study, according to the following formula:

$$n = \frac{Nz^2_{(\alpha)}P(1-P)}{(N-1)d^2 + P(1-P)z^2_{(\alpha)}}$$

Based on the prevalence of overweight in Saudi Arabia (35.5%) and estimated number of populations in Jazan region which is about two millions [24, 25]. This study survey enrolled a convenient random sample of 399 participants who took part in an online, self-report questionnaire shared via social media apps and networks. The inclusion criteria were Arabic-speaking young adults aged from 15 to 24 years living in Jazan region [25]. We excluded those who are younger than 15 years and older than 24 years, and those who refuse to complete the questionnaire.

1.2. Measures

1.2.1. Sociodemographic features

In the survey's first part, participants answered questions in regard to their gender, age, job situation, marital situation, work status, degree of education, salary, and residence place.

1.2.2. Weight Stigmatization Assessment (WSSQ)

Weight-related self-devaluation and fear of enacted stigma were evaluated by the WSSQ in two categories. Internal consistency and reliability are considerable in the Arabic WSSQ. The factorial structure is identical to that of the original English WSSQ, indicating that it is useful in cross-cultural research [26]. The self-devaluation section of the WSSQ had an internal consistency of .840, while the fear of enacted stigma had revealed .876 [27]. Thereupon, the Arabic WSSQ appears to be a valid tool for assessing weight-related self-stigma among people who speak Arabic.

1.2.3. Depression, anxiety, and stress scale 21 (DASS 21)

The Arabic version of depression, anxiety, and stress scale 21 (DASS 21), is a valid and reliable 21-questions, self-report measure composed of three domains to assess symptoms of depression, anxiety, and stress. Each subscales includes 7 questions, combined with a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). The total score is calculated by summing the questions on each subscale then multiplying the sum by 2, resulting in a score of 0-42 on each subscale. Cut-off points for severe depression, anxiety, and stress are 20, 14, and 25. Our analysis showed an internal consistency of α = .888 for depression, .864 for anxiety, and .890 for stress.

1.2.4. Data analysis

SPSS Statistics version 25.0 was carried out to conduct the statistical analysis. Descriptive and comparative statistics were used to analyze the data. For study variables, descriptive statistics such as frequency and percentage for qualitative variables and mean and standard deviation for quantitative data. The independent samples t-test or one-way Analysis of Variance (ANOVA) were used to establish the correlations between

variables. To analyze significant relationships in further depth, post-hoc Tukey's HSD was used. Simple linear regression model was created to predict WSSQ scores using subjects' BMI and scores on the DASS 21. P-value less than 0.05 was settled to be significant.

1.3. Ethical approval

The ethical approval was obtained from The Jazan Health Ethics Committee (permission number 2157, dated 03/08/2021). Before taking part in the study, minor participants (under the age of 18) were asked to get parental consent. All procedures involving human participants in our study were carried out in accordance with the institutional and/or national research committee's ethical standards, as well as the 1964 Helsinki declaration and its later amendments, or comparable ethical standards.

3. RESULTS

3.1. Baseline characteristics of the sample

The study enrolled a total of 399 participants; women made up 66.2% of the total. The study participants average age was 21.12 years ± 2.91 years. The baseline characteristics of the sample are shown in Table 1.

3.2. Self-devaluation

Table 2 shows the respondents' scores on the weight self-stigma questions. A significant difference between different body weights and self-devaluation was observed, $F(3, 391) = 23.86$, $p = .000$. Obese individuals had higher mean scores on the self-devaluation section than those who were average weight, underweight, or overweight, according to Tukey HSD test that utilized by hoc analyses (Table 1). Scores for self devaluing were importantly higher for subjects with severe depression (Mean = 20.33, SD = 5.55) compared to not severe form (Mean = 17.96, SD = 5.68), $t(397) = 4.80$, $p = .000$, according to the independent-samples t-test. For anxiety, scores for self-devaluation were significantly higher for subjects with severe anxiety (Mean= 19.53, SD = 5.55) than for subjects with milder forms of anxiety (Mean= 17.94, SD = 5.80), $t(397) = 2.77$, $p = .006$. For stress, scores for self-devaluation were significantly higher for subjects with severe stress (Mean = 20.61, SD = 5.45) than for subjects with milder forms of stress (Mean = 18.03, SD = 5.69), $t(397) = 53.92$, $p = .000$ (Table 1). There was no difference in self-devaluation between men and women, according to the independent-samples t-test, $t(397) = 0.04$, $p = .060$. (Table 1). A one-way between-subjects ANOVA showed no difference between self-devaluation and education level, $F(2, 396) = 0.62$, $p = .540$, or salary, , $F(3, 395) = 1.20$, $p = .311$ (Table 1).

3.3. Enacted stigmatization concern

A one-way ANOVA demonstrated a significant difference between different body weights and fear of enacted stigma, $F(3, 391) = 11.19$, $p<0.001$. Obese people had higher mean scores on the self devaluing domain than those who were normal weight, underweight, or overweight, according to post hoc analyses that use the Tukey HSD test (Table 1). Scores for fear of enacted stigma were significantly higher for subjects with severe depression (Mean = 13.4, SD = 6.32) than those with not severe form (Mean = 12.2, SD = 6.10), $t(397) = 4.95$, $p<0.001$, in accordance to the independent-samples t-test. For anxiety, scores for self-devaluation were significantly higher for subjects with severe anxiety (Mean = 12.56, SD = 6.11) compared to those with not severe forms of anxiety (Mean = 12.52, SD = 6.36), $t(397) = 3.72$, $p = .000$. For stress, scores for self-devaluation were significantly higher for individuals with severe (Mean= 12.56±6.11) stress compared to those with

not severe form of stress (Mean = 12.54, SD = 6.04), (Table 1). An independent-samples t-test showed no difference between men and women in enacted stigmatization concern, t(397) = 1.89, p = .971 (Table 1). A one-way between-subjects ANOVA revealed no difference between Enacted stigmatization concern and level of education, F(2, 396) = 0.49, p = .615, or salary, , F(3, 395) = .51, p = .674 (Table 1).

Table 1. Weight-self stigma and psychological distress.

Variables / Categories		Self-devaluation				Fear of enacted stigma		
		Total N (%)	Mean±SD	95% CI	*F* or *t*	Mean±SD	95% CI	*F* or *t*
All subjects			18.65±5.74	18.1-19.2		12.54±6.35	11.8-13.3	
BMI	Underweight <18.5	69 (17.3)	15.30[bc]±6.17	13.8-16.8	23.86**	14.33[a]±6.89	12.3-16-3	11.19**
	Normal weight 18.5-24.9	168 (42.1)	17.62[b]±5.07	16.9-18.4		11.27[b]±5.85	10-12.5	
	Overweight 25-29.9	92 (23.1)	20.62[a]±5.06	19.6-21.7		12.28[a]±5.59	10.9-13.7	
	Obese >30	66 (16.6)	21.92[a]±5.25	19.6-23.3		14.21[a]±6.57	11.4-17	
Sex	Male	135 (33.8)	18.64±5.76	17.7-19.6	0.04	12.76±6.17	11.4-14.1	1.89
	Female	264 (66.2)	18.66±5.74	17.9-19.4		12.42±6.40	11.5-13.4	
Education	Middle school	15 (3.8)	20.27±7.67	16-24.5	0.62	12.1±6.38	7.6-16.5	0.49
	High school	126 (31.5)	18.57±5.80	17.5-19.6		13.06±6.82	11.6-14.5	
	Bachelor	258 (64.5)	18.60±5.59	17.9-19.3		12.31±6.12	11.4-13.3	
Monthly income (SAR)	0−4999	101 (25.3)	18.52±6.43	17.2-19.8	1.20	13.5±7.30	11.9-15.3	0.51
	5,000−9,999	84 (21.1)	18.71±5.56	17.5-19.9		10.9±5.63	9.4-12.6	
	10,000−15,000	81 (20.3)	19.63±5.07	18.5-20.7		12.17±5.57	10.6-13.7	
	> 15,000	133 (33.3)	18.11±5.66	17.1-19.1		12.9±6.48	11.5-14.3	
Depression	Not severe	283 (70.9)	17.96±5.68	17.3-18.6	3.80**	12.2±6.10	11.2-13.2	4.95**
	Severe	116 (29.1)	20.33±5.55	19.3-21.3		13.4±6.32	12.1-14.6	
Anxiety	Not severe	220 (55.1)	17.94±5.80	17.2-18.7	2.77*	12.52±6.36	11.4-13.6	3.72**
	Severe	179 (44.9)	19.53±5.55	18.7-20.3		12.56±6.11	11.5-13.6	
Stress	Not severe	333 (100)	18.7±5.69	18.1-19.2	3.92**	12.54±6.04	11.7-13.3	5.60**

DASS 21. Depression, Anxiety, and Stress Scale 21. SD, standard deviation; CI, confidence interval; BMI, body mass index; SAR, Saudi Riyals. Independent samples t test or one-way Analysis of Variance (ANOVA) used as appropriate. Post-hoc Tukey's HSD test as following:

[a]$p < 0.01$ vs normal weight.

[b]$p < 0.01$ vs overweight.

[c]$p < 0.05$ vs normal weight.

*$p < 0.05$

** p < 0.01

3.4. Weight-self stigma and psychological distress

The scatterplot below (Figure. 1) illustrates the linear relationship between subject's mean scores on the weight-self stigma questionnaire and depression, anxiety, and stress scale 21. Although the correlation was weak [r(399) = .24, p<0.001], but it is statistically significant. This means that weight-self stigma was positively correlated with psychological distress in our study population.

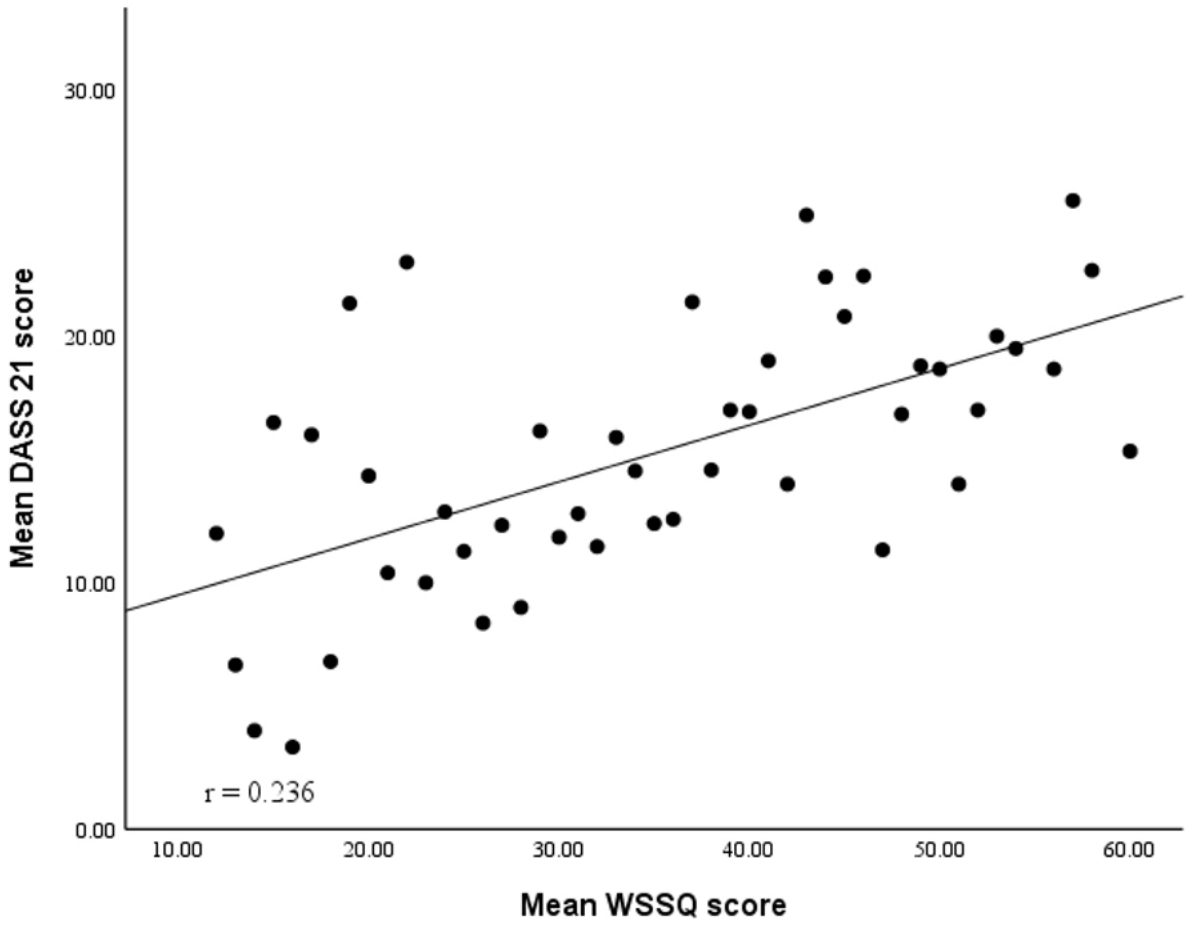

Figure1. Multiple Linear regression scatterplot between weight-self stigma questionnaire and psychological distress indicators.

A Multiple Linear Regression (MLR) model was used to assess predictors of weight-related self-stigma. Psychological distress and BMI as independent predictors explained 16% of the amount of variation in weight-related self-stigma with R2 = 0.16, adjusted R2 of i0.15 and F(2, 392) = 38.10, p < 0.001. The regression coefficients indicated that an increase in psychological distress score by one unit associated with a significant increase in the dependent variable by [B = 2.772, 95% CI [1.996, 3.547], p <0.001). Further the increase in BMI is also associated with significant increase in WSSQ score by [B = .079, 95% CI [0.047, 0.111, p <0.001]) (Table 2).

Table 2. Results of Multiple linear regression analysis for the independent predictors of weight-related self-stigma.

Model	**Unstandardized coefficients**		**Standardized coefficients (β)**	***t***	***p***	**95% CI**	
	B	SE				Upper	Lower
Constant	24.288	1.305		18.614	< .001	21.723	26.854
DASS 21	2.772	.395	.325	7.025	< .001	1.996	3.547
BMI	.079	.016	.224	4.832	< .001	.047	.111

CI, confidence interval; B, beta coefficient; SE, standard error; BMI, body mass index; DASS 21, Depression, anxiety, and stress scale 21.

4 Discussion

This study examined the relationship between weight-related self-stigma and psychological distress in a sample of Saudi young population. The results indicated that there was a positive correlation between weight-related self-stigma and psychological distress and an individual's BMI. This suggests that weight-related self-stigma is predicted to develop in participants with psychological symptoms and overweight by 7 and 4.8 times, respectively. This result is confirmed by regression analysis in which it is indicated that the strongest predictor for weight-related self-stigma was psychological distress (B = 2.772) followed by BMI (B = .079). Further, psychological distress and BMI directly predict weight-related self-stigma in the studied population. This finding is in line with previous research that demonstrated a strong association between psychological distress and weight-related self-stigma [11,12,28–31].

Weight-related self-stigma has well-known psychological consequences in overweight people. Longitudinal studies suggest that this relationship is causal, for instance, perceived weight-related stigma has been prospectively linked to an increased risk of stress and depression [32,33]. These findings challenge societal attitudes that stigma is justifiable and may motivate obese people to adopt healthy eating behaviors. The relationship between weight-related self-stigma, depression, anxiety, and stress in overweight individuals could be explained by the tendency of overweight people to have weight bias and negative attitudes toward obese people [34]. In addition, overweight people are exposed to negative stereotyping (e.g., weight teasing, biased attitudes, etc.) by family, friends, and media [29,35] Therefore, they develop psychological distress and harmful concepts on being overweight [36]. Psychological distress has also been identified as a risk factor mediating weight stigma and binge eating disorder [37]. As shown in Figure 1, weight-related self-stigma correlated with psychological problems. Experiencing weight self-stigma has serious implications for the mental and physical health of individuals with overweight [38]. Studies have shown that individuals who reported perceived weight discrimination are twice as likely to experience mood problems and exercise avoidance [39,40]. Some overweight

individuals internalize negative stereotypes, and these individuals are at an increased risk for binge eating and poor quality of life [34]. The findings revealed a substantial correlation between people's BMI and body-related self-stigma. This relationship was evident in the linear regression (B = .079). Previous research provided strong evidence that individuals with increased BMI are more likely to suffer from weight-related stigma [34]. However, the relationship between weight stigma and BMI has yielded multifarious results [41,42]. Cohorts from the United States demonstrated that people with greater BMI reported higher rates of weight stigmatization compared to discrimination of racial minorities and mentally ill people [43]. Obese patients with self-stigma need to be supported with adaptive ways to cope with weight-related stigma rather than using stigma as a motivation to lose weight. There is some evidence from randomized treatment studies that a brief 1-day intervention that trained patients on strategies to accept weight-related stigma resulted in greater improvement compared with wait-list controls. Brief interventions improved patients' quality of life, BMI, self-stigma, and psychological symptoms at 3-month follow-up [44]. Thus, interventions that can reduce weight-related psychological distress while empowering BMI control efforts provide a new treatment model that seems justifiable [45].

Despite it is one of the few studies in the region that sought the predictors weight self-stigma using validated assessment tools, our study has some limitations. The study is cross-sectional and does not explain the causal relationship between weight-related self-stigma and its predictors. In addition, the sample consisted mainly of female participants, making it difficult to generalize our findings. However, the study is the first to examine weight self-stigma and its association with psychological distress in Saudi Arabia. It may serve as a model for future studies aiming at reducing weight-related stigma and its psychological consequences. Future studies should look for the causal relationships between the weight-related self-stigma and its different predictors like quality of life in light of different study designs. Our results suggest that there is a real need to develop interventional plans to minimize the risk of weight-related self-stigma by anticipating its predictors and including weight stigma as a primary goal in programs to manage and treat obesity and overweight.

4. Conclusion

The present study revealed that depression, anxiety, stress, and BMI predicted weight-related self-stigma in young Saudi population. Weight self-stigmatization, which include self-devaluation and the concern of enacted stigmatization, correlated positively with overall psychological distress. These findings highlight the critical role of psychological distress in weight-related stigma. Future studies should aim at teaching patients adaptive strategies to cope with psychological consequences of weight self-stigma as means of controlling weight and improving the overall wellbeing of patients with obesity.

CONSENT AND ETHICAL APPROVAL

This study had been ethically approved by The Jazan Health Ethics Committee (permission number 2157, dated 03/08/2021). Before taking part in the study, minor participants (under the age of 18) were asked to get parental consent. All procedures involving human participants in our study were carried out in accordance with the institutional and/or national research committee's ethical standards, as well as the 1964 Helsinki declaration and its later amendments, or comparable ethical standards. Additionally, permission was obtained from each participant. No name or other personal details were collected for this study as all the questionnaires were anonymous. All information collected was kept confidential and used only for scientific purposes.

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