

The impact of obesity on suicidality among female patients suffering from bipolar affective disorder: the indirect role of body dissatisfaction

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Abstract – The aim of study is to evaluate the impact of body dissatisfaction and obesity on suicide attempts in patients suffering from Bipolar Affective Disorder (BAD). The study included a cross-sectional cohort of patients diagnosed with BAD who were treated at Sveti Ivan Psychiatric Hospital in Zagreb. The studied group was composed of female patients in the remission phase of BAD, aged 18 to 65 years. Through evaluation of the Body Mass Index (BMI), patients were divided into two groups: the study group (BMI>30), and a control group (BMI ranging from 18 to 25). Following this segmentation, the patients filled out two questionnaires: a schematic perception test (Figure Rating Scale) to determine body dissatisfaction, and a modified Beck Scale for Suicidal Ideation to determine suicidal intensity. The study established a difference in body dissatisfaction between obese patients and patients with average body weight suffering from BAD. Higher BMI corresponded with higher dissatisfaction with body appearance. In addition, the study determined a statistically significant difference in suicidal intensity according to the Beck scale with regard to the level of satisfaction with body appearance. A significant correlation between dissatisfaction with body appearance and suicidal intensity according to the Beck Scale for Suicidal Ideation indicates that evaluation of dissatisfaction with body appearance could be used in daily clinical work as an indicator for suicidality in patients suffering from BAD. Statistically significant body dissatisfaction and a generally higher level of dissatisfaction, which have been confirmed as predictors of suicidality, were found in obese patients.

Key words: Bipolar Affective Disorder, body dissatisfaction, female, obesity, suicidality

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Introduction

Obesity is becoming a growing public health challenge and a preventive and therapeutic priority among the adult population, with a significant increase in prevalence recorded over the past two decades [1-3]. Obesity not only constitutes a serious health

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threat, it is also comorbid with other medical conditions, including psychiatric disorders [4-11]. One of the most frequent methods for establishing obesity is the measurement of the BMI (Body Mass Index), expressed as mass in kilograms over height in meters squared [12-13]. Obesity is a frequent condition among persons suffering from Bipolar Affective Disorder (BAD) and is associated with significant impairments in quality of life as a result of increased body weight [14-16]. It is significantly correlated with disorder outcome among patients suffering from BAD [17]. Obese persons, in comparison with those of average body weight, experience a greater number of depressive and manic episodes during their lifetime, and their clinical presentations have a higher intensity of symptoms and more frequent depressive residues [18-22].

Obesity is associated with several significant psychological and social factors such as poorer quality of life, deficient social functionality, greater sense of dissatisfaction, lowered self-esteem, and poorer overall bodily health [23-26]. Current cultural norms encourage the ideal of a slim body build. Contemporary Western cultures deem obese persons to be responsible for their state, and they promote an attitude of personal responsibility for many aspects of life including the control of body weight and appearance. As a result of these cultural assumptions, obese people are often described as “lazy, ugly and stupid.” Obese persons therefore, often experience discrimination and are stigmatized in their professional and private lives. Taking into consideration these negative attributions, it is logical that obese persons face an increased risk of developing various disorders, including severe, mental disorders and suicidal behaviors [20-27].

Suicidal behavior is defined as encompassing a broad semantic spectrum: from suicidal ideation, verbalization, planning, intent and self-harming to attempted suicides and their execution, i.e., committing suicide. Suicidal behavior is an etiologically complex phenomenon predicated on biological, environmental, developmental and learned factors [28-31]. With BAD, there is a high rate of suicidal risk of approximately 15 percent. Suicidal behaviors are the third leading general cause of mortality, and the third leading cause of mortality in the 15- to 24-year-old age group [21,24,32-35].

In similar studies of large, nationally representative sample groups (over 40,000 people), Carpenter et al. found a gender-dependent correlation between obesity and depression. Among a group of obese women, 37% had experienced a severe depressive episode, 20% had experienced suicidal ideation, and 23% had attempted suicide in the past year. Among women of average body mass, no correlation with either depression or suicidality was found [7].

Women are preoccupied with their body mass and figure. They aspire to an ideal body, and they evaluate themselves based upon how they look, i.e., their outer appearance [36-39]. The perception itself of real bodily appearance is affected by the “ideal” appearance of a body and social stereotypes [37,40,41]. The body is seen as a reflection of the self. The body image is both a way in which people experience themselves but, equally importantly, a way in which they believe that others see them. Body image changes constantly over the lifetime depending upon objective and subjective influences (growth, trauma, pain, operations). The cultural environment and its common definitions of what is desirable and attractive play a significant role in the devel-

opment of body image. A person's body image includes their perception of cultural standards, an evaluation of the measure in which they are consistent with standards, and a perception of the importance of membership in a cultural group and of one's place within it [40-42]. Numerous studies have shown that the impact of body image on self-concept is greater among women than among men. Women are preoccupied with their appearance and their perception of how others see them. The female self-concept is correlated with a personal perception of one's own attractiveness [43,44]. In the human species, unlike in animal species, women have a decorative role and are evaluated based on attractiveness, as has been demonstrated by studies conducted in 190 different cultures [45]. The impact of the media and propaganda is very significant, and it typically determines standards of beauty. Surrounded by models and film stars on TV, women set for themselves physiologically impossible goals and demands. As a result, many women are unsatisfied with their body and body image [39,44,46,47].

The purpose of this study was to investigate whether there was a difference in suicidality between the two groups suffering from BAD with regard to body dis(satisfaction) in obese female patients and female patients of average body weight.

Subject and methods

Subjects

The study included women in the 18- to 65-year-old age group that have been diagnosed with BAD in the remission phase.

The subject group consisted of the following:

1. Individuals suffering from diagnosed BAD and having suicidal ideation or attempts in their anamnesis that met the criteria for obesity;
2. Individuals suffering from diagnosed BAD of average body mass, also having suicidal ideation or attempts in their anamnesis.

The diagnoses were determined by two independent psychiatric specialists based upon the criteria for the Classification of Mental Disorders and Behavioral Disorders MKB-10: Clinical Descriptions and Diagnostic Guidelines (Tenth Revision), after structured psychiatric interview using the Young Mania Rating Scale (YMRS) i Montgomery- Asperg Depression Rating Scale (MADRS) (48-50).

The study included 71 female subjects for whom the Body Mass Index (BMI) was determined based on the well-established formula [12,13]. After the BMI was determined, the subjects were divided into two groups: the study group and the control group. Based upon their BMI, 29 of the subjects met the criteria for obesity (BMI>30) and constituted the study group, while 42 subjects met the criteria for average body mass based on the BMI (BMI of from 18 to 25) and constituted the control group. Both groups of subjects had suicidal ideation or attempts at suicide in their anamnesis.

Informed Consent and IRB approval

The study was conducted in line with ethical standards and with the approval of the Ethics Commission of Sveti Ivan Psychiatric Hospital after the subjects gave signed consent, following oral and written explanation of the purposes and aims of the study.

The identity of subjects was fully protected, and personal subject data were not published in any form. The results of the study

were used exclusively for scientific and non-profit purposes (dissertation, further scientific work).

Methods

Upon determination of BMI, the patients were distributed into the study and control groups. Body weight was determined by weighing, height measurements were taken, and the BMI was calculated using the appropriate formula.

Body (dis)satisfaction was evaluated using a schematic body perception test (Figure Rating Scale) that determines actual figure and desired body figure, with the difference constituting body (dis)satisfaction. Referring to nine female silhouettes depicting body size, ranging from severe emaciation (“1”) to severe obesity (“9”), subjects were asked to indicate: “your current size and shape” (current); “the size and shape you would most like to be” (ideal); and “the size and shape you feel men in general find most attractive” (attractive). This procedure has been used widely in similar research [51].

Suicidality was assessed with the aid of a Modified Beck Scale for Suicide Ideation (Suicide risk: the intent score scale). The scale consists of 12 items and is divided into three parts: questions related to the objective circumstances of the suicide attempt, issues relating to the personal testimony of the patient and the third part, which includes the expected risk. The total sum at the end of the scale is arranged as follows: low risk is a sum of 0-3, medium risk is a sum of 4-10, and high risk is if the sum is greater than 11 [52].

Results

All statistical processing was done in IBM SPSS, version 21.

The age distribution had a statistically significant deviation from the normal distribution in the group of subjects of normal body mass (Kolmogorov-Smirnov $z = 0.149$; $P = 0.020$), as a result of which median and interquartile ranges were used as a measure of central tendency. The median (interquartile range) age for the group of subjects with average body mass was 44.5 (32 – 50.5), while the median age for the group of obese subjects was 48 (42.5 – 57). The obese subjects were significantly older (Mann-Whitney $U = 438$, $Z = -2.002$; $P = 0.048$; $AUC = 0.36$).

A significant difference was established in body dissatisfaction between actual and desired figure with respect to Body Mass Index (Mann-Whitney $U = 199.5$; $Z = -4.958$; $p < 0.001$; $AUC = 0.16$). Obese subjects had a significantly greater difference between their actual and desired figure (Table 1).

There was a significant difference in body satisfaction between obese subjects and those of average body mass (Fisher’s Exact Test, $p = 0.01$). Obese subjects had an almost nine times greater chance of being dissatisfied with their bodies than subjects with average mass ($OR = 8.7$; $95\% CI = 2.27 – 33.08$) (Table 2).

There was a statistically significant difference in suicide attempts among subjects for whom the difference between actual and desired figure is three or greater in relation to subjects for whom the difference between actual and desired figure is less than three (Hi^2 test = 4.619; $p = 0.037$; contingency coefficient $C = 0.247$). Subjects for whom the difference between actual and desired figure was three or greater (dissatisfied with their body) had a five times greater chance of attempting suicide than subjects for whom the difference between actual and desired figure was

Table 1. Difference in body dissatisfaction (difference between actual and desired figure) with respect to Body Mass Index (n=71)

	Diff. between actual and desired figure X (sd)	P
Body Mass Index		
Normal body mass	0.7* (0.81)	<0.01; 0.16
Obesity	2.5 (1.60)	

LEGEND: X = arithmetic mean; sd = standard deviation; P = Mann-Whitney U test for continued variables, level of statistical significance, i.e., likelihood of a type 1 error (alpha); AUC (Area Under the Curve) – calculated as: $U/(n1 \times n2)$ where U is the statistic of the Mann-Whitney test, and n1 and n2 are the sample sizes of the two groups, given as a standardized measure of effect

*p<0.01 in relation to the difference between the actual and desired figure of obese subjects

Table 2. Body satisfaction prediction with respect to Body Mass Index (n=71)

	Body satisfaction						OR _{uv}	95% CI
	Dissatisfied		Satisfied		Total			
	n	(%)	n	(%)	n	(%)		
Body Mass Index								
Normal body mass	21	(50.0)	21	(50.0)	42	(100.0)	1	
Obesity	26	(89.7)	3	(10.3)	29	(100.0)	8.7 (2.27 – – 33.08)	

LEGEND: OR = Odds Ratio; 95% CI = 95% confidence interval of Odds Ratio; uv = univariant logistic regression

less than three (satisfied with their body) (OR = 5.0; 95% CI = 1.03 – 24.56) (Figure 1).

A statistically significant difference in suicidality intensity based upon the Beck Scale for Suicide Ideation was established with respect to satisfaction with body appearance (Mann-Whitney U = 263, Z = -2.161; p = 0.031; AUC = 0.33) (Table 3).

With respect to the Body Mass Index, however, obese subjects did not have a statistically significant greater chance of attempting suicide in relation to subjects of average body mass (OR = 1.1; 95% CI = 0.42–2.94).

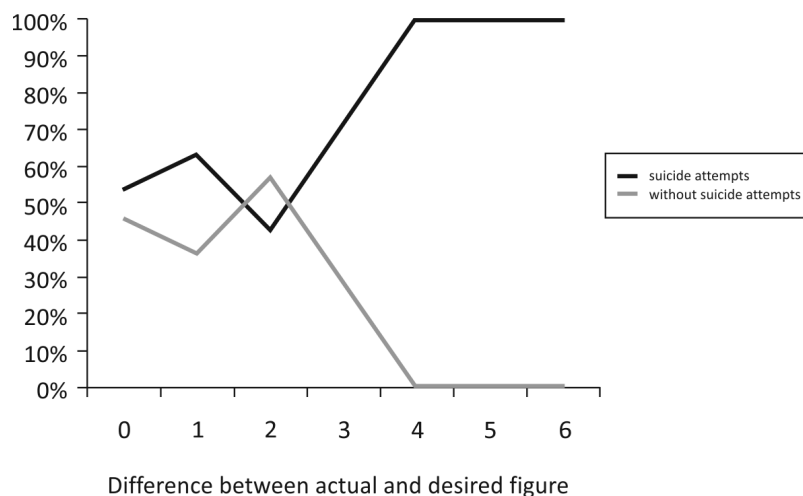


Figure 1. Prevalence of suicide attempts with respect to the difference intensity between actual and desired figure

Table 3. Difference in suicidality intensity based on the Beck Scale for Suicide Ideation with respect to body satisfaction (n=71)

	Beck Scale		p; AUC
	X	(sd)	
Body satisfaction			
Satisfied (result <3)	2.0*	(0.94)	0.031; 0.33
Dissatisfied (result ≥3)	2.6	(0.76)	

LEGEND: X = arithmetic mean; sd = standard deviation; p = Mann-Whitney U test for continued variables, level of statistical significance, i.e., likelihood of a type 1 error (alpha); AUC (Area Under the Curve) - calculated as: $U/(n1 \times n2)$ where U is the statistic of the Mann-Whitney test, and n1 and n2 are the sample sizes of the two groups, given as a standardized measure of effect

*P=0.031 in relation to the result of the Beck Scale among subjects dissatisfied with the body appearance

Discussion

This study posed three questions:

1. Does body mass have an impact on body (dis)satisfaction?
2. Does body (dis)satisfaction have an impact on suicide attempts?
3. Does obesity have an impact on suicide attempts?

The study was conducted on females because studies conducted on the female popu-

lation have indicated an association between body dissatisfaction and obesity with suicidality. The results of the study show that women are preoccupied with their appearance and that a sense of satisfaction with their own body is important to them [36,37,44].

The majority of subjects in this study, both obese and of average body mass, were distributed in the 36 to 55 year age range. In observing the age of the subjects in relation to the Body Mass Index, it is evident that the obese subjects were of a statistically significant older age than subject of average body mass. This finding corresponds with results in literature that demonstrate that obesity increases with age and that obese persons are more prevalent in older age groups. The reasoning may be biological factors such as the change in the distribution of fat deposition, the nutritional habits of the population and a lack of physical activity [3,6,10]. The cited research pertains to the general population, while among patients suffering from BAD obesity can also be due to the interaction of the disorder itself with body mass [8,14,18].

A desire for thinness (or weight gain), i.e., (dis)satisfaction with body image, was observed using the Figure Rating Scale. Based upon the intensity of dissatisfaction, the majority of obese subjects demonstrated a greater intensity of dissatisfaction in relation to subjects of average body mass.

Based on the results obtained, obese subjects are more dissatisfied with their appearance, i.e., they wish to be thinner. The cited results are consistent with the literature, i.e., it was also found that there is a significant difference in dissatisfaction or satisfaction with appearance between the obese and those of average body mass. Being obese is stigmatized in Western culture [20,25-27]. The im-

portance of being accepted by others and preoccupation with body appearance are particularly significant among women, and women in our milieu, similar to those from the Western cultural sphere, are fascinated by the ideal figure of a woman that constitutes the contemporary ideal of beauty and that comprises the attributes of attractiveness, health, sex appeal and societal success. The impact of the media is very significant and, surrounded by models and film stars, women set for themselves goals that are physiologically impossible [39-42,44]. Obese people often experience discrimination, are rejected by society, are unattractive to others, or themselves make this assessment of the opinions of others, all based upon a favored standard of body appearance [38,42,47]. Body image is the way in which people experience themselves but, equally importantly, it is also the way they believe others perceive them [36,40,42].

The cultural environment and its accepted paradigms and value systems of what is desirable and attractive play a significant role in the development of body image [39,43]. Someone's body image includes their perception of cultural standards, an assessment of the measure in which it is consistent with standards, and a perception of the importance of being a member of a cultural group and of one's own place within the group [37,40,41,44]. Numerous studies have shown that the impact of body image on self-concept is greater among females than males. Women are preoccupied with their appearance and their perception of how others see them. Women's self-concept is correlated to the personal perception of one's attractiveness [37,38,43,46].

In the human species, unlike in animal species, women have a decorative role and are evaluated based upon attractiveness, as

has been demonstrated by studies conducted in 190 different cultures [43-46].

The concept of beauty has never been a static one but has changed over time in all milieus, and each culture milieu has its own and unique definition of beauty. The definitions of beauty may correspond in some or several elements with other cultures. Studies have shown that body mass and the experience of self as an obese person is an important factor in the majority of cultures impacting satisfaction or dissatisfaction with body image, especially among women [36-38,43].

The results of this study show that there is a statistically significant difference in suicide attempts among subjects for whom the difference between actual and desired figure is three or greater than among subjects where the difference between actual and desired figure is less than three. Subjects for whom the difference between actual and desired figure was three or greater (dissatisfied with their body) had a five times greater chance of attempting suicide in relation to subjects for whom the difference between actual and desired figure was less than three (satisfied with their body). There is, therefore, a sharp rise in the prevalence of suicide attempts among subjects for whom the difference between the actual and desired figure was three or greater.

Subjects for whom the difference between actual and desired figure was three or greater (dissatisfied with their body) scored significantly higher on the Beck Scale for Suicide Ideation than subjects for whom the difference between actual and desired figure was less than three.

This can only partially be compared to the literature, as similar studies of body dissatisfaction and suicidality were largely conducted among adolescents and young women, while

there are no known studies for the older age group or psychiatric patients of any diagnostic category [53,54]. Studies have been conducted among patients who received operations for breast carcinomas, and a correlation was found in these subjects between body dissatisfaction and suicidality [55]. Among young women and adolescents, numerous studies have indicated interdependency between body dissatisfaction and suicidality. Studies indicate that greater body dissatisfaction is correlated with a greater prevalence of suicide attempts [53,54].

There was no statistically significant difference between the subjects in suicidality intensity based on the Beck Scale with respect to Body Mass Index.

There are contradictory results in literature, but most of the studies cited indicate a correlation between obesity and suicidality. A greater intensity of BAD and a greater BMI are significantly correlated with suicide attempts. Obese people have more depressive than manic episodes; they manifest more intense, more serious affective episodes and they have worse disorder outcomes that most often are manifested as suicide attempts. Obesity alone may lead to an increased risk of suicide because of the significant psychosocial consequences, including discrimination and stigmatization in most areas of everyday life. Obesity is believed to negatively affect quality of life, self-esteem and a psychophysical sense of well-being and functionality [56,57].

Twenty-four studies found an association between obesity and significant emotional distress, while twenty-five studies found only minor problems. In similar studies of large, nationally representative sample groups (over 40,000 people), Carpenter et al. found a gender-dependent correlation between obesity

and depression [7]. In a one-year period, 37 percent of obese women suffered a major depressive episode, 20 percent experienced suicidal ideation, and 23 percent attempted suicide. Among women of average body mass, however, no association was found with depression or suicidality. On the other hand, other studies have shown that extreme obesity significantly increases the frequency of suicide attempts and confirmed a correlation between suicide attempts and BMI [9,56,57]. Taking the cited data into consideration, it is evident that obese persons have an increased risk of developing various disorders, including severe mental disorders and suicidal behaviors. Obesity, according to the literature, appears to be a major factor responsible for the intensity of BAD itself, worse outcomes, and ultimately suicidal attempts.

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Limitations of this study include the sample size, but despite this limitation, given the significant differences, we can discuss the predictive value of body dissatisfaction and resultant obesity on suicidality in patients suffering from BADs.

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Conflict of interest

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Utjecaj adipoziteta na suicidalnost među ženskim pacijenticama oboljelim od bipolarnog afektivnog poremećaja: indirektna uloga nezadovoljstva svojim tijelom.

Sažetak – Cilj istraživanja bio je procijeniti utjecaj nezadovoljstva tijelom i pretilosti na pokušaj suicida u bolesnica koje boluju od bipolarnog afektivnog poremećaja (BAP). U prosječnom istraživanju sudjelovale su bolesnice s dijagnosticiranim BAP-om koje su liječene u Psihijatrijskoj bolnici "Sveti Ivan" u Zagrebu. Promatrana skupina sastavljena je od pacijentica u fazi remisije, u dobi od 18 do 65 godina. Prema indeksu tjelesne mase (BMI), pacijentice su bile raspodijeljene u dvije skupine: Ispitivana skupina (BMI>30) i kontrolna skupina (BMI u rasponu od 18 do 25). Nakon podjele, pacijentice su ispunile dva upitnika: Test shematske percepcije (Figure Rating Scale) kako bi se utvrdilo nezadovoljstvo tijelom i modificiranu Beckovu ljestvicu za suicidalnost. Rezultati istraživanja ukazali su da postoji razlika u nezadovoljstvu tijelom između pretilih bolesnica i bolesnica s prosječnom tjelesnom masom koje boluju od BAP-a. Viši BMI korespondira s većim nezadovoljstvom tjelesnim izgledom. Dobivena je statistički značajna razlika u intenzitetu suicidalnosti s obzirom na stupanj zadovoljstva/nezadovoljstva tjelesnim izgledom. Značajna korelacija između nezadovoljstva izgledom tijela i suicidalnog intenziteta ukazuje na to da se procjena nezadovoljstva tjelesnim izgledom može koristiti u svakodnevnom kliničkom radu kao indikator za suicidalnost kod pacijenata koji pate od BAP-a. Statistički značajno nezadovoljstvo tijelom i općenito viša razina nezadovoljstva, koje su potvrđene kao prediktori suicidalnosti, pronađeni su kod pretilih pacijenata.

Ključne riječi: Bipolarni afektivni poremećaj, nezadovoljstvo tijelom, pretilost, suicidalnost, ženski spol