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Trabajo Original

Otros

Can mindful eating be a psycho-marker of obesity in bipolar disorder?

¿Puede ser la alimentación consciente un psicomarcador de obesidad en el trastorno bipolar?

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Abstract

Background and aim: obesity is a very important problem in individuals with bipolar disorder. The study was aimed to determine the prevalence of obesity in individuals with bipolar disorder and to evaluate the effects of factors affecting eating behavior such as mindful eating, impulsivity and eating disorders on the development of obesity in these individuals.

Methods: this study is a cross-sectional study. A total of 109 individuals (52 female; 57 male) with bipolar disorder who were in a euthymic state at the time of the interview and underwent outpatient follow-up, treatment and monitorization, and 109 age- and sex-matched healthy individuals as the control group were included in the study. The Mindful Eating Questionnaire-30 (MEQ-30), Three-Factor Eating Questionnaire (TFEQ-21), Barratt Impulsiveness Scale 11-Short Form (BIS-11-SF), and Eating Attitude Test-26 (EAT-26) were used, and anthropometric measurements (height, bodyweight, etc.) were taken.

Results: the obesity rate was 50.4 % among the cases and 24.8 % in the control group. Moreover, disinhibition (3.4 ± 0.93), emotional eating (3.5 ± 1.13), and mindfulness (2.6 ± 0.54) scores of individuals with BD were significantly lower than for healthy individuals (3.7 ± 0.82, 4.0 ± 0.93, 2.8 ± 0.55, respectively). The risk of obesity was 5.19 times higher in cases compared to the age- and gender-matched controls (OR = 5.19, 95 % CI (2.01-13.37), $p = 0.001$). The risk of obesity was 2.76 times higher in those with low mindful eating level (OR = 2.76, 95 % CI (1.07-5.47), $p = 0.014$) and 4.29 times higher in those using antipsyhotics/mood stabilizers (OR = 4.29, 95 % CI (1.12-12.24), $p < 0.001$).

Conclusion: a comprehensive education program on mindful eating and healthy eating would be helpful in elucidating the mechanisms of the possible relationships between bipolar disorder-specific risk factors and mindful eating.

Keywords:

Mindful eating. Bipolar disorders. Obesity. Eating disorders. Impulsivity.

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Resumen

Antecedentes y objetivos: la obesidad es un problema muy importante en los individuos con trastorno bipolar. El objetivo era determinar la prevalencia de la obesidad en individuos con trastorno bipolar y evaluar los efectos de los factores que afectan a la conducta alimentaria, como la alimentación consciente, la impulsividad y el trastorno alimentario, en el desarrollo de la obesidad de estos individuos.

Métodos: se trata de un estudio transversal. Un total de 109 individuos (52 mujeres; 57 hombres) con trastorno bipolar que se encontraban en estado eutímico en el momento de la entrevista y se sometieron a seguimiento, tratamiento y monitorización ambulatorios, y 109 individuos sanos emparejados por edad y sexo como grupo de control, fueron incluidos en el estudio. Se utilizaron el Mindful Eating Questionnaire-30 (MEQ-30), el Three-Factor Eating Questionnaire (TFEQ-21), la Barratt Impulsiveness Scale 11-Short Form (BIS-11-SF) y el Eating Attitude Test-26 (EAT-26), y se tomaron medidas antropométricas (altura, peso corporal, etc.).

Resultados: la tasa de obesidad fue del 50,4 % en los casos y del 24,8 % en el grupo de control. Además, las puntuaciones de desinhibición (3,4 ± 0,93), alimentación emocional (3,5 ± 1,13) y atención plena (2,6 ± 0,54) de los individuos con BD fueron significativamente inferiores a las de los individuos sanos (3,7 ± 0,82, 4,0 ± 0,93, 2,8 ± 0,55, respectivamente). El riesgo de obesidad era 5,19 veces mayor en los casos en comparación con los controles emparejados por edad y sexo (OR = 5,19, IC 95 % (2,01-13,37), $p = 0,001$). El riesgo de obesidad fue 2,76 veces mayor en los que tenían un bajo nivel de alimentación consciente (OR = 2,76; IC 95 % (1,07-5,47), $p = 0,014$) y 4,29 veces mayor en los que utilizaban antipsicóticos/estabilizadores del ánimo (OR = 4,29; IC 95 % (1,12-12,24), $p < 0,001$).

Conclusiones: un programa educativo integral sobre *mindful eating* y alimentación saludable sería útil para dilucidar los mecanismos de las posibles relaciones entre los factores de riesgo específicos del trastorno bipolar y la comida consciente.

Palabras clave:

Alimentación consciente. Trastornos bipolares. Obesidad. Trastornos alimentarios. Impulsividad.

INTRODUCTION

Bipolar disorder (BD) is a recurrent, long-course disorder that typically begins at a young age with depressive episodes, manic/hypomanic episodes, and mixed mood periods with symptoms of both extremes and with full recovery or subthreshold symptoms between these mood periods, affecting the social and occupational functioning of the person. Genetic, epigenetic, and environmental factors play a role in its etiology (1).

Compared with the general population, individuals with BD have an increased morbidity and mortality rate. This results in a shorter life expectancy of 9-20 years among individuals with BD. Research suggests that the basis for this is an increased risk of metabolic diseases such as autoimmune diseases, overweight and obesity-related diabetes, and cardiovascular diseases, which are associated with more frequent medical comorbidities in individuals with BD (2,3).

Studies report that more than half of individuals with bipolar disorder are overweight or obese. Platzer et al. found that 44.6 % of male individuals with BD were overweight and 31.1 % were obese, while these rates were 21.5 % and 30.7 %, respectively, for female individuals with BD (4). It has been reported that individuals with BD are 1.77 times more likely to be obese than healthy individuals (5). Etiogenic factors of obesity in individuals with BD include potential weight gaining effects of psychotropic drugs (atypical antipsychotics, mood stabilizers), disorders in the neuro-endocrine system and neurotransmitter dysfunction, atypical depression symptoms, poor lifestyle (poor diet quality, sedentary lifestyle), and genetic predisposition for weight gain (4-6).

Obesity in individuals with BD leads to significant health problems. Therefore, it is of great importance to understand the factors underlying eating behaviors that lead to the development of obesity in these individuals. In this study, it was aimed to determine the prevalence of obesity in individuals with bipolar disorder and to evaluate the effects of factors affecting eating behavior such as mindful eating, impulsivity and eating disorder on the development of obesity in these individuals.

METHODS

PARTICIPANTS

The study was designed as a case-control study. A total of 109 outpatients diagnosed with bipolar disorder, 52 females and 57 males, as well as 109 age- and sex-matched healthy individuals as the control group were included in the study. The study was conducted between May-December 2022 in euthymic individuals diagnosed with bipolar disorder by a psychiatrist according to DSM-5 diagnostic criteria, who were followed up, treated, and monitored on an outpatient basis at Manisa Mental Health and Diseases Hospital. Patients between the ages of 18-60, literate, able to communicate verbally in the scales administered, euthymic for the last six months, without metabolic syndrome, and who agreed to participate in the study after being informed were included in the study. Patients with impaired cooperation and cognitive functions due to mental retardation, neurological disease, alcohol, and substance abuse or being under the influence of alcohol or substance at the time of recruitment, and those with schizophrenia or schizoaffective disorder, organicity-related affective disorder, and those who did not have sufficient command of the Turkish language to answer the questions were excluded from the study. As a control group, age- and gender-matched individuals without neuropsychiatric disorders and alcohol and substance abuse, without prenatal and/or postnatal period, who were Turkish citizens and who was born and bred within their families and and Turkish culture for at least 3 generations were included. The present study was conducted in accordance with the Helsinki Declaration. It was approved by an independent review board of the Ege University (Medical Ethics Committee decision no: 22-1.1T/40 date: 14.01.2022). Verbal and written consent was obtained from all the participants.

MEASURES

Anthropometry and BMI

Height was measured, without shoes, feet together, knees straight, heels, hips, and shoulder blades in contact with the ver-

tical surface in the Frankfort position with a stadiometer (Seca mod. 240 CE 0123, Germany), whereas body weight and body composition (% body fat, fat-free mas) was measured with light clothing, without shoes with Accuniq BC310 bioelectric impedance device (SELVAS Healthcare Inc., Daejeon, Korea). Weight and height were used to calculate body mass index (BMI) as weight in kilograms divided by height in meters squared. Weight status was classified according to WHO categories as follows: underweight (BMI < 18.5), normal weight (BMI between 18.5 and 24.9), overweight (BMI between 25 and 29.9), and obesity (BMI ≥ 30).

Mindful Eating Questionnaire (MEQ-30)

The Mindful Eating Questionnaire was developed by Framson et al. in 2009 to assess the level of mindful eating in individuals (7). A Turkish validity and reliability study of the scale was conducted in 2016 by Köse et al. (8). Unlike the original, the Turkish version of the scale consists of 30 items and seven subscales. The high score obtained from each sub-dimension of the scale indicates that the individual has the characteristic assessed by the relevant sub-dimension. Each item was scored between 1 and 5, and the overall total score is obtained from the average of the scores of 7 subscales, and higher scores indicate more mindful eating.

Three-Factor Eating Questionnaire (TFEQ-21)

This scale was first developed by Stunkard and Messick in 1985 to measure behavioral and cognitive components of eating (9). A Turkish validity and reliability study of the questionnaire was conducted by Karakuş et al. (10). Higher scores indicate greater cognitive restraint, binge eating, or emotional eating.

Eating Attitude Test (EAT-26)

It was developed by Garner et al. (1982) to measure the symptoms of anorexia nervosa (11). It was adapted into Turkish by Okumuş and Sertel (2020), and used as a measurement tool in their study and used as a measurement tool in their study (12). In the EAT-26 test, the results are determined by assessing the sum of the scores of the 26 items. The test results in values ranging from 0-53. For EAT-26, 20 points is considered as the cut-off point. Values of ≥ 20 are considered "at risk of eating behavior disorder" and values of < 20 points are considered "without risk of eating behavior disorder".

Barratt Impulsiveness Scale-11-Short Form (BIS-11-SF)

This scale developed by Patton, Standford, and Barratt (1995), and was adapted into Turkish by Tamam, Güleç and Karataş (13,14). When assessing the BIS-11-SF, four different sub-scores are obtained. These are total score, inability to plan, attentional impulsivity, and motor impulsivity scores. The higher the total BIS-11-SF score, the higher the impulsivity level of the patient.

STATISTICS

Data were analyzed with SPSS 26.0 (Statistical Package for Social Sciences IBM-SPSS Inc., Armonk, NY). The conformity of the variables to normal distribution was analyzed using Shapiro-Wilk test. For categorical variables, descriptive statistics were expressed as numbers and percentages, and for continuous variables, mean and standard deviation were used. Differences between groups were evaluated using Student's t-test or Chi-square analysis. Pearson Correlation analysis was used to analyze the relationship between the subjects' BMI with other parameters. Multinominal logistic regression analysis was used to identify risk factors associated with obesity. The results were considered significant at $p < 0.05$.

RESULTS

PARTICIPANTS

A total of 109 outpatients diagnosed with bipolar disorder, 52 females and 57 males, as well as 109 age- and sex-matched healthy individuals (52 F/57 M) as the control group were included in the study. The mean age of the groups was 40.6 ± 10.19 years. The BMI of the patients was 30.4 ± 6.80 kg/m^2 and 26.9 ± 4.92 kg/m^2 in the control group ($p < 0.001$). According to the BMI classification, 50.4 % of the patients were in the obese group, 27.5 % were in the overweight group, and only 19.3 % were in the normal weight group. In the control group, 24.8 % of the individuals were obese and 42.2 % were overweight ($p < 0.001$). Table I presents the sociodemographic characteristics of the participants.

MEASUREMENTS

The results of the questionnaires administered to the participants are presented in table II. When mindful eating was analyzed, the MEQ-30 score of the patients was 3.3 ± 0.52, while the score of the control group was 3.5 ± 0.43 ($p = 0.005$). In MEQ-30 subscale scores, disinhibition, emotional eating and mindfulness scores of the patients were significantly lower than the control group. Similar to Chung et al., an arbitrary cut-off point on the level of mindful eating was made using the mean score to facilitate the interpretation of the study results (15). Therefore, any scores above 3.50 were considered to be a high level of mindful eating. It was determined that 56.9 % ($n = 62$) of the cases and 42.2 % ($n = 46$) of the control group had low mindful eating level ($p = 0.030$). The TFEQ-21 score of the patients (50.4 ± 9.69) was significantly higher than that of the control group (42.6 ± 10.19) ($p < 0.001$). Similarly, it was determined that the BIS-11-SF score and the scores of all subscales were higher in the patients.

Table I. Sociodemographic characteristics of the participants

	Case (*n* = 109)	Control (*n* = 109)	*p*
*Age (years) ($\tilde{x}$ ± SD)	40.6 ± 10.19	40.6 ± 10.19	1.000
Gender, n (%)			
Female	52 (47.7)	52 (47.7)	1.000
Male	57 (52.3)	57 (52.3)	
Marital status, n (%)			
Single	70 (64.2)	27 (24.8)	< 0.001
Married	39 (35.8)	82 (75.2)	
Education, n (%)			
Illiterate	4 (3.7)	-	0.070
Primary	56 (51.3)	44 (40.4)	
High school	33 (30.3)	42 (38.5)	
Bachelor degree	16 (14.7)	23 (21.1)	
Employment, n (%)			
Worker	51 (46.8)	104 (95.4)	*< 0.001*
Unemployed	58 (53.2)	5 (4.6)	
Smoking, n (%)			
Yes	72 (66.1)	54 (49.5)	*0.010*
No	37 (33.9)	55 (50.5)	
†Number of daily cigarettes ($\tilde{x}$ ± SD)	25.5±18.4	15.1±8.23	*< 0.001*
Body weight satisfaction, n (%)			
Satisfied	36 (33.0)	52 (47.7)	*0.021*
Indecisive	25 (22.9)	28 (25.7)	
Dissatisfied	48 (44.0)	29 (26.6)	
*Anthropometric measurements**			
Height (m)	1.68 ± 0.11	1.69 ± 0.98	0.542
Body weight (kg)	85.8 ± 18.97	77.1 ± 16.13	*< 0.001*
Body fat percentage (%)	28.1 ± 14.02	26.1 ± 9.81	0.462
Body fat mass (kg)	26.0 ± 16.11	21.2 ± 9.99	*0.009*
BMI (kg/m^2)	30.4 ± 6.80	26.9 ± 4.92	*< 0.001*
Class of BMI, n (%)			
Underweight	3 (2.8)	2 (1.8)	*0.001*
Normal	21 (19.3)	34 (31.2)	
Overweight	30 (27.5)	46 (42.2)	
Obesity	55 (50.4)	27 (24.8)	

**Student's t-test, p < 0.01; Chi-square test, p < 0.01. Italics fonts indicate significant differences.*

Table III shows the relationships between the subjects' BMI and some parameters. A weak negative correlation was found between BMI and MEQ-30 score (r = -0.233, p = 0.001). There was a weak positive correlation between BMI and TFE21 score and EAT-26 score (r = 0.373, $p \leq 0.001$; p = 0.182, r = 0.007, respectively). While there was a negative weak correlation between MEQ-30 and BIS-11-SF, there was a negative moderate correlation between MEQ-30 score and TFEQ-30 score.

The analysis of group differences in obesity markers showed a higher rate of obesity in cases compared to the control group (OR = 3.06, CI = 1.53-6.10, p = 0.002). After adjusting the data, it was determined that subjects had a higher risk for obesity compared to the control group (OR = 5.19, CI = 2.01-13.37, p = 0.001), those with low mindful eating (OR = 2.76, CI = 1.07-5.47, p = 0.014), and those receiving antipsychotic or mood stabilizing medication (OR = 4.29, CI = 1.12-12.24, $p \leq 0.001$). Multinomial logistic regression analysis results are presented in table IV.

Table II. Assessment of participants' scale results

	Case (*n* = 109) ($\bar{X}$ ± SD)	Control (*n* = 109) ($\bar{X}$ ± SD)	*p*
Mindful Eating Questionnaire-30	3.3 ± 0.52	3.5 ± 0.43	*0.005*
Disinhibition	3.4 ± 0.93	3.7 ± 0.82	*0.011*
Emotional eating	3.5 ± 1.13	4.0 ± 0.93	*0.001*
Eating control	3.8 ± 0.96	4.0 ± 0.83	0.194
Focus	3.4 ± 0.57	3.4 ± 0.44	0.979
Eating discipline	3.3 ± 0.81	3.2 ± 0.8*3*	0.484
Mindfulness	2.6 ± 0.54	2.8 ± 0.55	*0.012*
Interference	3.4 ± 1.06	3.7 ± 0.91	0.125
Three Factor Questionnaire-21	50.4 ± 9.69	42.6 ± 10.19	*< 0.001*
Uncontrolled eating	21.9 ± 5.46	17.9 ± 5.89	*< 0.001*
Cognitive restraint	15.6 ± 3.83	15.1 ± 3.89	0.310
Emotional eating	12.9 ± 4.3	9.6 ± 3.72	*< 0.001*
Barratt Impulsiveness Scale-11-SF	25.2 ± 7.77	21.4 ± 6.51	*< 0.001*
Non-planning	10.3 ± 5.17	8.9 ± 3.95	*0.043*
Motor impulsivity	8.1 ± 3.9	6.4 ± 2.65	*< 0.001*
Attention impulsivity	6.9 ± 3.24	6.0 ± 2.68	*0.041*
Eating Attitude Test-26	14.7 ± 9.73	8.8 ± 6.25	*< 0.001*
	n (%)	***n (%)***	
*Eating disorder risk**			*< 0.001*
≥ 20	27 (24.8)	9 (8.3)	
< 20	82 (75.2)	100 (91.7)	

*Student's t-test; *Chi-square test. Italics fonts indicate significant differences.*

Table III. Assessment of the relationship between BMI and other parameters

	BMI		MEQ-30		BIS-11-KF		TFEQ-21		EAT-26	
	r	***p***	**r**	***p***	**r**	***p***	**r**	***p***	**r**	***p***
BMI	1	-	*-0.233*	*0.001*	0.129	0.058	*0.373*	*< 0.001*	*0.182*	*0.007*
MEQ-30			1	-	*-0.384*	*< 0.001*	*-0.580*	*< 0.001*	0.030	0.655
Barratt-11-SF					1	-	*0.257*	*< 0.001*	0.060	0.379
TFEQ-21							1	-	*0.265*	*< 0.001*
EAT-26									*1*	-

Pearson correlation analysis. Italics fonts indicate significant differences.

DISCUSSION

This study aimed to investigate the level of mindful eating and the factors impacting mindful eating in individuals with BD. In this study, it was revealed that the level of ME (mindful eating) in individuals with BD was lower than in healthy individuals, and they had problems, especially in disinhibition, emotional eating, and mindfulness behaviors. It was found that binge eating, lack of planning, motor impulsivity, and attention impulsivity scores were higher in individuals with BD than in healthy individuals.

Table IV. Result of the multinomial logistic regression for BMI

	Overweight		Obesity	
Variables	**OR (95 % CI)**	***p***	**OR (95 % CI)**	***p***
Crude model				
Group (Ref: Control)				
Case	0.98 (0.49-1.95)	0.978	3.06 (1.53-6.10)	*0.002*
Adjusted model				
Group (Ref: Control)				
Case	1.55 (0.63-3.82)	0.346	5.19 (2.01-13.37)	*0.001*
Gender (Ref: Female)				
Male	1.43 (0.67-3.09)	0.351	1.07 (0.48-2.38)	0.864
Age	1.05 (1.02-1.09)	0.005	1.06 (1.02-1.11)	*0.002*
Education (Ref: Bachelor's degree)				
Primary	0. 84 (0.29-2.39)	0.737	1.43 (0.48-4.28)	0.530
High school	0.74 (0.27-2.06)	0.569	0.68 (0.22-2.08)	0.679
Marital status (Ref: Single)				
Married	2.50 (1.09-5.75)	0.031	2.55 (1.07-5.47)	*0.036*
Smoking (Ref: Yes)				
No	1.06 (0.49-2.31)	0.879	2.42 (1.07-5.47)	*0.034*
Mindful eating (Ref: High)				
Low	1.43 (0.66-3.11)	0.364	2.76 (1.22-6.23)	*0.014*
BIS-11-SF Score	0.99 (0.94-1.04)	0.601	0.99 (0.94-1.04)	0.674
Antipsyhotic/Mood stabilizing medications (Ref: No)				
Yes	1.44 (0.61-3.41)	0.409	4.29 (1.12-12.24)	*< 0.001*
EAT-26 Score	0.99 (0.94-1.04)	0.615	0.99 (0.95-1.05)	0.950

Reference: Underweight/Normal; BIS-11-SF: Barratt Impulsiveness Scale-11-Short Form; EAT-26: Eating Attitudes Test-26. Italics fonts indicate significant differences.

Besides, it was found that the risk of eating behavior disorder was higher in individuals with BD and 50.4 % of these individuals were obese.

Increased obesity rates in individuals with BD is one of the most important problems. In studies, it was found that the risk of obesity was 1.62-1.77 times higher in individuals with BD and the obesity rate ranged between 29 % and 45 %, with abdominal obesity reaching 51.1 % (6,16). Gurpegei et al. found that the risk of obesity was 4.6 times higher in these patients compared to the control group (17). Increased obesity predisposes individuals with BD to insulin resistance, type II diabetes and cardiovascular diseases (16). It is also known that obesity is associated with an increase in the duration of depressive episodes and hospitalization due to depression, worsening of the course of the disease, inability to feel and increased risk of suicide (18). Therefore, combating obesity in individuals with BD is of great importance.

Recently, the determination that mindful eating level is low in individuals with eating disorders and obese people has led to an increased interest in this issue. Studies in different groups have shown that a high level of mindful eating is associated with high diet quality, healthy body mass index (BMI) and waist circumference, and reduced depressive symptoms, risk of food addiction, and binge eating behavior (19-21). In this study, it was determined that individuals with BD had lower levels of mindful eating than healthy individuals. This may exacerbate health risks in individuals with BD and/or add new problems to these risks.

Studies have found that higher ME scores are associated with improved mental well-being and reduced symptoms of depression (21,22). Hence, it may be beneficial to conduct intervention studies to increase mindful eating in individuals with BD. Gidugu and Jacobs reported that restrictive eating behavior, emotional

eating, binge eating, and disinhibition decreased significantly and mindfulness increased significantly in individuals as a result of mindful eating and nutrition education applied for 14 weeks to a group with SMI, including individuals with BD (23).

It has been suggested that individuals with high levels of mindful eating have healthy eating behaviors and healthy eating habits (24). Studies have documented that BMI level increases as the mindful eating level decreases and obese individuals have lower mindful eating levels than normal or lean individuals (32). Considering the level of mindful eating in addition to medication use, poor dietary habits, sedentary lifestyle, and other comorbidities, which have been shown to cause a high prevalence of obesity in individuals with BD, could be helpful in avoiding obesity and obesity-related health risks in this patient group (6,25).

Disinhibition behaviors and socially inappropriate behaviors seen in individuals with bipolar disorder are among the important symptoms of the disease (26). It was determined that the disinhibition (unrestrained eating) score, which is one of the subscales of mindful eating, showed a negative correlation with psychiatric symptoms. The results obtained from this study were found to be consistent with the literature. Boulanger et al. found that disinhibition was associated with binge eating behaviors in individuals with BD, with individuals having approximately two more levels of disinhibition, and patients with BE behaviors tended to eat in response to emotional cues and lacked control over food intake (27). It has been reported that typical antipsychotics, some atypical antipsychotics, and mood stabilizers used in treatment cause insulin resistance, increased appetite, increased body weight, and waist circumference, which is often accompanied by disturbances in executive functions that facilitate dysregulation and disinhibition in food intake (28).

Emotional eating is positively associated with BMI, abdominal obesity, increased waist circumference and body fat percentage, failure of weight loss attempts, increased risk of eating disorders, and deterioration of mental health (29). Martin et al. found that individuals with BD have a higher prevalence of emotional eating and binge eating behaviors than healthy individuals and that this is associated with maladaptive nutritional behaviors (30). In a population of patients with BD and schizophrenia, the prevalence of emotional eating behavior was found to be 49.2 % and patients were found to have high scores on the emotional eating subscale of the TFEQ-21 (31). Emotional dysregulation in individuals with BD is a key feature of the psychopathology of bipolar disorder and is an affective instability associated with a worse course of the illness (e.g., more severe episodes, increased number of hospitalizations). The level of psychological distress and emotional eating are significant predictors of emotional dysregulation (32). Likewise, similar results were obtained in this study and it was determined that the increase in emotional eating behavior was a strong factor in the decrease in mindful eating levels.

One of the most important reasons for weight gain in individuals diagnosed with bipolar disorder is pharmacotherapy. Atypical antipsychotics and mood stabilizers, as well as their combined use, have been associated with increases in overweight and obesity among patients being treated with these drugs. With the initiation of treatment, it was found to cause significant weight gain in all patients, notably in drug-naive patients and more pronounced in lean and normal-weight individuals (33,34). Doane et al. found that 30.4 % of patients who started atypical antipsychotic treatment had clinically significant weight gain (> 7 %) and the obesity rate in this population was 50.7 % (35). In patients receiving mood stabilizers, 8.2 % of lithium users and 8.5 % of valproate users experienced weight gain (36). Antipsychotic agents exert this effect by altering leptin metabolism and the activity of dopaminergic, histaminergic, muscarinergic, and serotoninergic receptors (5-HT2C) that regulate hunger/satiety and appetite. Changes in these receptors can cause hyperphagia behavior in patients and compulsive consumption of palatable foods containing high carbohydrates and fats (37). Davison, meanwhile, found that the rate of cognitive restraint and disinhibition was higher in individuals with mental disorders than in healthy individuals, that mood stabilizers were associated with weight gain, and the use of atypical antipsychotics and mood stabilizers was associated with disinhibition score (38).

LIMITATIONS

The study has some limitations that should be taken into account. Firstly, the scales were administered on the basis of self-report. Participants who completed these scales may have caused self-report bias by reporting socially accepted behaviors instead of some actual eating behaviors (39). Secondly, more systematic approaches are needed to evaluate the effect of the methods used in the treatment of bipolar disorder on eating behavior. Medications used in the treatment are known to have different effects on eating behavior. For instance, while there is a difference between atypical antipsychotics and mood stabilizers in terms of their effect on patients' eating behaviors, there is also a difference between the effects of atypical antipsychotics olanzapine and aripiprazole. Although none of the individuals in our study had a diagnosis of personality disorder, we consider it an important limitation that personality traits and temperament differences have not been studied. We would like to emphasize that the personality and temperament characteristics of the patients should also be examined in future studies to form a more homogeneous group among patients in terms of mindful eating. Finally, the data were obtained from participants receiving outpatient treatment at the same center. It would be useful to conduct comprehensive studies involving different centers.

CONCLUSION

It has been well-established that eating behavior disorders and obesity are common problems in individuals with bipolar disorder. In this study, it was revealed that emotional eating and binge eating behavior, disinhibition, and impulsivity in individuals with BD lead to decreased levels of mindful eating,

adversely affect the eating behavior of individuals and are one of the main factors underlying the high rate of overweight and obesity. It was found that patients with severe mental disorders lost weight, improved their physical functions, and decreased depression levels in physical activity intervention studies combined with healthy nutrition education (40). However, it has been shown that intervention programs that address psychological factors such as mood, anxiety, and stress in addition to nutrition education and physical activity changes are more successful in helping individuals acquire healthy eating habits and eating behaviors. In the mindfulness intervention study, it was shown that emotional eating and binge eating behaviors of individuals with bipolar disorder decreased, and mindful eating levels increased and this intervention practice may be a helpful option for individuals with severe mental disorders. Thus, studies with larger sample groups are needed to elucidate the mechanisms of possible relationships between bipolar disorder-specific risk factors and mindful eating. Mindfulness education designed specifically for individuals with BD can improve physical health and mental well-being.

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