Research Article

# Investigation of the relationship between eating attitude and body composition of patients with anxiety disorders

Anksiyete bozukluğu olan hastaların yeme tutumu ile vücut kompozisyonu arasındaki ilişkinin incelenmesi

iD Hülya Ertekin

[a]Department of Psychiatry, School of Medicine, Canakkale Onsekiz Mart University, Canakkale, Turkey

## ABSTRACT

**Introduction:** The aim of this study was to evaluate the relationship between eating attitude, body composition and disease severity in patients with anxiety disorders.

**Methods:** This is a cross-sectional case-control study conducted between January-March 2018 in Clinic of Psychiatry of Çanakkale Onsekiz Mart University Medical Faculty of Hospital. Beck depression scale (BDI), beck anxiety scale (BAI) and eating attitude test (EAT) were applied to patients diagnosed as anxiety disorder according to DSM-5 criteria and to healthy controls. Body compositions of all participants were measured by Bioimpedance Analysis (BIA).

**Results:** Twenty-five patients with anxiety disorders and 25 healthy controls were included in the study. The BDI and BAI scores of the participants measured the severity of anxiety and depressive symptoms were statistically higher than the controls. (p <0.001). There were statistically significant positive correlations between BDI and BAI, EAT and BMI (p = 0.029, r = 0.436; p = 0.001, r =.630, respectively). There was a statistically significant positive correlation between EAT and BMI (p = 0.027, r = 0.441). There were no statistically significant differences between two groups in terms of body fat ratios.

**Conclusions:** Our study shows that patients with anxiety disorders should be evaluated for obesity and related factors and necessary recommendations should be made.

**Keywords:** anxiety disorders, obesity, body composition, eating attitude

## ÖZ

**Giriş:** Bu çalışmanın amacı anksiyete bozukluğu olan hastaların yeme tutumu, vücut kompozisyonu ve hastalık şiddeti arasındaki ilişkiyi değerlendirmektir.

**Yöntem:** Ocak-Mart 2018 tarihleri arasında, Çanakkale Onsekiz Mart Üniversitesi Tıp Fakültesi Hastanesin Psikiyatri Kliniği'nde yapılmış kesitsel vaka-kontrol çalışmasıdır. DSM-5 tanı ölçütlerine göre anksiyete bozukluğu tanısı almış hastalar ve sağlıklı kontrollere beck depresyon ölçeği (BDÖ), beck anksiyete ölçeği (BAÖ) ve yeme tutumu testi (YTT) uygulandı. Tüm katılımcıların vücut kompozisyonu ölçümü Bioimpedans Analizi (BIA) ile yapıldı.

**Bulgular:** Çalışmamıza DSM-5'e göre anksiyete bozukluğu olan 25 hasta ve 25 sağlıklı kontrol alındı. Katılımcıların anksiyete ve depresif belirtilerinin şiddetini ölçen BDÖ ve BAÖ puanları kontrollerden istatistiksel olarak anlamlı yüksekti (p<0,001), YTT bakımından ise her iki grup arasında anlamlı fark saptanmadı. BDÖ ile BAÖ, YTT ve vücut kitle indeksi (VKİ) arasında istatistiksel olarak anlamlı pozitif korelasyonlar saptandı (sırasıyla p=0,029, r=0,436; p=0,001, r=0,630) . YTT ile VKİ arasında istatistiksel olarak anlamlı pozitif korelasyon saptandı (p=0,027, r=0,441). İki grup arasında vücut yağ oranları bakımından istatistiksel olarak anlamlı fark saptanmadı.

**Sonuç:** Çalışmamız anksiyete bozukluğu olan hastaların obezite ve ilişkili konularda değerlendirilmesi ve gerekli önerilerde bulunulması gerektiğini göstermektedir.

**Anahtar kelimeler:** anksiyete bozuklukları, obezite, vücut kompozisyonu, yeme tutumu

# Introduction

Anxiety is a biological factor that stimulates the individual to take action and act in the face of a danger or threat. Anxiety is a very important part of the response to stress, allowing the individual to take action in the event of danger. The pathological anxiety is more severe than expected, lasts longer, disrupts the daily functions of the individual and negatively affects his / her life. Anxiety disorders are common mental disorders with loss of functionality. [1]. Anxiety disorders according to DSM-5 (Diagnostic and Statistical Manual of Mental Disorders-5) classification; generalized anxiety disorder; panic disorder; agoraphobia; social phobia; specific phobia; separation anxiety disorder; selective non-speaking (mutism), substance/medication-induced anxiety disorder, and anxiety disorder due to another medical condition, specified anxiety disorder, unspecified anxiety disorder.

Obesity is a chronic medical disorder that occurs as a result of the increase in body fat mass compared to lean body mass as a result of the fact that the energy taken by food is more than the energy consumed. Obesity; plays an important role in the etiology of many health problems especially in metabolic syndrome (MetS), cardiovascular diseases and endocrine diseases [2]. The prevalence of diseases such as cardiovascular diseases, obesity and MetS in the society has been increasing in recent years. Cardiovascular diseases are among the leading causes of death worldwide and in our country. However, depression, anxiety, personality characteristics and stress contribute to the development of cardiovascular diseases [3]. Anxiety disorders and depression have been shown to be the second most common disease in the world. It is known that especially patients with depression and anxiety disorders have higher risk from the community in terms of MetS, obesity and cardiovascular diseases [4]. The prevalence of obesity, depression and anxiety is increasing in the industrialized world [5].
Body fat mass is measured by bioelectrical impedance analysis (BIA). Recent studies have shown that the distribution of body fat mass is an important risk factor for cardiovascular diseases. There are data that psychiatric disorders may affect body fat distribution, especially visceral fat accumulation [6]. It has also been shown that abdominal obesity may play a role in the development of depression [7, 8].

Eating attitude occurs with an interaction of psychomotor development and environmental factors. Eating behaviors and attitudes are take part of the etiology of obesity. In previous studies, it was shown that high level of anxiety affects eating attitudes [9].

The aim of this study was to evaluate the relationship between eating attitude, body composition, and severity of anxiety and depressive symptoms in patients with anxiety disorders.

# Methods

This is a cross-sectional case-control study conducted in Çanakkale Onsekiz Mart University Hospital between January-March 2018. Ethics committee approval was received from Çanakkale Onsekiz Mart University Faculty of Medicine for the study (Decision No: 27.12.2017-2017-21). The study group consisted of 25 patients who were examined in the Psychiatry Clinic of outpatient unit of Çanakkale Onsekiz Mart University Hospital, diagnosed with anxiety disorders according to DSM-5 diagnostic criteria, and who were accepted to participate in the study. The study consisted of 25 healthy individuals who agreed to participate in the study from the accompanying staff and hospital staff of the patients who were treated in non-psychiatric departments of the hospital with no known psychiatric disorder.

### Process and Tools of Data Collection

Demographic data form, Beck Depression Inventory (BDI) [10], beck anxiety scale (BAI) [11], and eating attitude test (EAT) were applied tol all participants. In order to measure the severity of depressive symptoms BDI, to measure the severity of anxiety BAI, and evaluate eating attitude EAT were used. Body composition was measured by Bioimpedance Analysis (BIA) of all participants.
Patients were classified for obesity according to BMI. Weight (kg) / Height (m$^2$) formula was used to calculate body mass index (BMI). It was evaluated as 0-18.9 weak, 19-24.9 normal weight, 25-29.9 overweight, 30-34.9 obese and 35-44.9 morbidly obese.
Patients under the age of 18, with chronic diseases, alcohol-substance dependence, pregnancy, and mental retardation to prevent filling the scales were excluded from the study.

### Bioelectrical impedance analysis (BIA)

Body analysis was performed according to the manufacturer's instructions with Tanita BC418 (Tanita Corporation, Tokyo, Japan). Patients; he were called for a body analysis after 8 hours of fasting in the morning,. After emptying the bladder at room temperature, the bare feet and the electrodes were taken to the platform where the measurements were made by holding the electrodes at the body level with their bare hands. Body fat mass was calculated with electrodes given multiple level frequencies.

### Statistical Analysis

The obtained data were analyzed with SPSS (SPSS Inc., Chicago, IL, USA) Version 20.0 for Windows program. Chi-square test was used to compare categorical data and student t test was used to compare non-categorical data. Pearson correlation test was used for correlation analysis. Values of p≤0.05 were considered statistically significant.

## Results

Twenty-five patients with anxiety disorders and 25 healthy controls who met the criteria for inclusion in the study were included in the study. There were 24 female and 1 male patients in the patient group. 80% (n = 20) of the patients had Generalized Anxiety Disorder (GAD), 16% (n = 4) had Panic Disorder (PD) and 4% (n = 1) had Social Anxiety Disorder (SAD). The mean age of the patient group was 43.08 ± 11.53 years, and the mean age of the control group was 42.45 ± 9.88 years. No statistically significant differences were found between patient and control groups when comparing the body fat ratios and abdominal fat ratioa between the patient and control groups (Table 1).

The BDI and BAI scores of the patients were statistically higher than the controls (p <0.001) (Table 1).

There were statistically significant positive correlations between BDI and BAI, EAT and BMI scores (p = 0.029, r = 0.436; p = 0.001, r = 0.630, respectively). There was a statistically significant positive correlation between EAT and BMI scores (p = 0.027, r = 0.441). (Table 2).

44% (n = 11) of the patients were normal weight, 28% (n = 7) were overweight, 4% (n = 1) were obese and 24% (n = 6) were morbidly obese.

**Table 1. Comparison of demographic data of patients and healthy controls groups**

| | | PG (n,%) | HC (n,%) | p | χ² /t |
|---|---|---|---|---|---|
| Gender | Female | 24(96) | 19(76) | 0.098 | 0.049 |
| | Male | 1(4) | 6(24) | | |
| Age | | 43.08±11.53 | 42.45±9.88 | 0.841 | 0.202 |
| Education (years) | | 10,08.±4.60 | 12.20±5.00 | 0.128 | -1.549 |
| Marital Status | Married | 18(72) | 20(83.3) | 0.541 | 1.228 |
| | Single | 4(16) | 3(12.5) | | |
| | Widow | 3(12) | 1(4.2) | | |
| BDI | | 22.52±10.92 | 5.25±5.92 | **<0.001** | 6.638 |
| BAI | | 26.72±18.24 | 8.16±7.29 | **<0.001** | 4.637 |
| EAT | | 20.32±12.27 | 15.79±11.05 | 0.182 | 1.355 |
| BMI | | 28.32±8.35 | 30.00±5.64 | 0.411 | -0.830 |
| BFR (%) | | 34.55±9.62 | 35.22±8.10 | 0.793 | -0.670 |
| BFR (kg) | | 26.50±14.18 | 28.85±9.86 | 0.506 | -0.264 |
| AFR (%) | | 29.93±10.09 | 32.92±7.55 | 0.255 | -1.152 |
| AFR (kg) | | 12.58±6.07 | 15.12±5.33 | 0.139 | -1.508 |

PG : Patients group, HC: Healthy Controls, Beck Depression Scale: BDI, Beck Anxiety Scale: BAI, Eating Attitude Test: EAT, Body Mass Index: BMI, Body Fat Ratio: BFR, Abdominal Fat Ratio: AFR. Chi-square test was used to compare categorical ones, and student t test was used to compare non-categorical data.

**Table 2. Correlation analysis of BDI, BAI and EAT and body fat ratios of patients with anxiety disorders;**

| | | BMI | BDI | BAI | EAT | BFR (%) | BFR (kg) | AFR (%) | BFR (kg) |
|---|---|---|---|---|---|---|---|---|---|
| BDI | r | **0.436** | 1 | **0.630** | **0,596** | 0.156 | 0.351 | 0.014 | -0.053 |
| | p | **0.029** | | **0.001** | **0.002** | 0.476 | 0.101 | 0.948 | 0.728 |
| BAI | r | 0.174 | 0.630 | 1 | 0.120 | 0.067 | 0.111 | 0,056 | -0.004 |
| | p | 0.406 | 0.001 | | 0.567 | 0.760 | 0.615 | 0.799 | 0.979 |
| EAT | r | **0.441** | **0.596** | 0.120 | 1 | 0.103 | 0.399 | -0.123 | 0.179 |
| | p | **0.027** | **0.002** | 0.567 | | 0.639 | 0.059 | 0.575 | 0.241 |

Beck Depression Scale: BDI, Beck Anxiety Scale: BAI, Eating Attitude Test: EAT, Body Mass Index: BMI, Body Fat Ratio: BFR, Abdominal Fat Ratio: AFR. Pearson correlation analysis was performed.

**Table 3. Correlation analysis of BDI, BAI and EAT and body fat ratios of healthy controls**

| | | BMI | BDI | BAI | EAT | BFR (%) | BFR (kg) | AFR (%) | BFR (kg) |
|---|---|---|---|---|---|---|---|---|---|
| BDI | r | 0.065 | 1 | 0.351 | 0,197 | 0.182 | 0.245 | 0.360 | 0.152 |
| | p | 0.765 | | 0.199 | 0.357 | 0.395 | 0.248 | 0.092 | 0.499 |
| BAI | r | 0.276 | 0.351 | 1 | 0.338 | **0.428** | 0.339 | 0,048 | 0.377 |
| | p | 0.192 | 0.199 | | 0.106 | **0.037** | 0.105 | 0.827 | 0.083 |
| EAT | r | 0.302 | 0,197 | 0.338 | 1 | 0.396 | 0.393 | 0.249 | **0.426** |
| | p | 0.151 | 0.357 | 0.106 | | 0.056 | 0.057 | 0.252 | **0.048** |

Beck Depression Scale: BDI, Beck Anxiety Scale: BAI, Eating Attitude Test: EAT, Body Mass Index: BMI, Body Fat Ratio: BFR, Abdominal Fat Ratio: AFR. Pearson correlation analysis was performed.

## Discussion

In this study, we investigated the relationship between body composition, disease severity, and eating attitudes in patients with anxiety disorders, and compared the findings of patients with BMI matched healthy controls.

The majority of our patients were female. Studies have shown that all anxiety disorders are higher in women than men except social anxiety [13]. Consistent with this data, female gender ratio was found to be higher in patients admitted with anxiety disorder in our study.

Although the mean age of onset of anxiety disorders was early twenties, it was found that symptoms started much earlier. However, it is known that some of the anxiety disorders become chronic, persist in older ages and progress with recovery and relapse [14]. The mean age of the patients was 43.08. However, the age of onset and duration of disorder were not evaluated in the patients included in the study. The high mean age of the patients in our study can be explained by the recurrence or chronicity of these disorders. The lack of assessment of disorders duration and age of onset of the disorders can be considered limitations of our study.

In a study conducted in our country, the prevalence of GAD in general health services was found to be 2%. GAD is the highest anxiety disorder in the community [15]. Consistent with this data, 80% of the patients with anxiety disorders included in our study were GAD patients. Anxiety disorders are often accompanied by additional psychiatric disorders. One of the most common psychiatric disorders associated with anxiety disorders is depression [16]. However, alcohol-substance use disorders, bipolar disorder, eating disorders and somatoform disorders are other comorbid psychiatric disorders associated with anxiety disorders [15]. In our study, the mean scores of BDI were found to be significantly higher in the patient group than healthy controls. This result suggests that patients may have a comorbid depression or may have complaints related to depression. Since it is known that depression is frequently comorbid with anxiety disorders, that our data is consistent with the literature.

According to World Health Organization data, 11% of adults over the age of 20 are obese. The prevalence of obesity in our society has been increasing in recent years. The results of Turkey Diabetes, Obesity and Hypertension Epidemiology Study suggest that the prevalence of obesity, in women 44.2%, and 27.3% for men in our country [17]. Psychiatric disorders have a high risk for obesity It has been shown that similar genes and mediators are affected in obesity and psychiatric diseases [18]. Numerous studies had been conducted about obesity and related factors, especially in chronic psychiatric disorders such as schizophrenia and bipolar disorder [19-21]. There are many studies investigating the prevalence of depression and anxiety disorders in obesity. Some of these studies showed higher rates of depression and anxiety disorders in individuals with obesity, whereas some of the studies found lower rates of depression and anxiety disorders, and some of them did not find a difference [22]. 56% of the patients with anxiety disorder included in our study were in the overweight or obese group. Obese and morbidly obese patients accounted for 28% of all patients, indicating that one in four patients were obese or morbidly obese. This is an important result that reveals that obesity is a very important problem for patients with anxiety disorder. As a result of our study, no statistically difference was found in the distribution of body fat in terms of patient and control groups. There were no significant correlations between scores of BDI, BDA scales, and body fat ratios. In the study evaluating the body composition of depression patients Taş et al., found a negative correlation between the level of anxiety and abdominal fat percentage [23].

In this study, a significant positive correlation was found between EAT and BMI and BAI scores of patients with anxiety disorder. Özsoylar et al. found no significant relationship between eating attitude and panic symptoms in panic disorder patients [24]. There are no studies evaluating the relationship between eating attitude, anxiety severity and BMI in anxiety disorder patients in the literature.

## Limitations

There were some limitations of this study. The number of patients was low included in the study. Another limitation was that patients were not evaluated during longitudinal follow-up. In addition, patients were under treatment. These treatments may cause an increase in appetite and affect patients eating attitudes.

## Conclusion

Our study has shown that patients with anxiety disorders have risks for obesity and related disorders, especially patients with high levels of depressive symptoms. This study may lead to future studies that involve similar parameters, evaluate patients before and after treatment, with large size participations.

**Conflict of interest:** None
**Financial Disclosure:** None

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