

International Journal of Original Educational Research

Research Article

Sibel Çevik Başduvar ,
dytsibelcevik@gmail.com

Haydar Özpınar
haydarozpinar@aydin.edu.tr

The Effect of Obesity on Depression, Anxiety and Hedonic Hunger in Adult Individuals

İstanbul Aydın Üniversitesi Sağlık Bilimleri Fakültesi Beslenme ve Diyetetik Bölümü, 34295 Beşyol, İstanbul
Orcid: 0000-0001- 5073-4887

Aim: Obesity negatively affects people's quality of life. Many studies have shown that there is a serious connection between obesity and psychiatric disorders such as depression and anxiety. At the same time, obesity stimulates the feeling of pleasure towards foods, causing more food consumption. This study aimed to investigate the relationships between depression, anxiety and hedonic hunger in obese individuals.

Method: In this research, scanning model was used based on the quantitative research method. The population and sample group of the research consists of a total of 400 volunteer participants, 348 women and 52 men, aged 18-60, with a body mass index of 30 and above, living in Diyarbakır. The survey form prepared as a data collection technique was collected face to face and online. The socio-demographic form, Beck depression scale (BDI), Beck anxiety scale (BAI) and Food Migration Scale (FDI) were applied to the participants.

Findings: When the socio-demographic characteristics of the participants are examined, it is seen that 87% are women and 13% are men, 83% are married, 36% are university graduates, and 57.7% are between the ages of 31-40. Regarding the general habits and health conditions of the participants; 9.7% of them use medication constantly, It was reported that 64.3% of the participants did not smoke, 7.3% consumed alcohol, 65.3% did regular physical activity, and 60% had regular sleep hours. When their eating habits are examined, it is seen that they consume mostly energy-rich pastries and sugary products. Participants in the study in terms of weight; It was determined that 63.5% were first degree obese (BMI 30-34.9), 26.2% were second degree obese (BMI 35-39.9), and 10.2% were third degree obese (BMI 40 and above). It was determined that men's BMI, depression, anxiety levels and hedonic hunger levels were higher than women ($p \leq .05$). It was observed that the BMI, Depression level, Anxiety Level and Hedonic hunger level of the participants who ate mostly carbohydrates (pastries, sugary) and fried foods increased. In terms of average daily sleep time, 71.8% of the participants were found to be between 6-8 hours. It was determined that participants with a sleep duration of 6-8 hours had lower BMI levels than participants with a sleep duration of 2-4 hours, that is, individuals with a high BMI slept less. The study found that as body mass index increased, depression, anxiety and hedonic levels increased.

Conclusion: There are many studies showing a connection between psychological disorders and eating behavior. It has been observed that people tend to eat more in situations such as depression and anxiety. It has been observed in many studies that the degree of obesity increases due to the increase in the amount of food consumed just for pleasure and pleasure, without any need for hedonic hunger. As a result, this study revealed that as the degree of obesity increases, levels of depression, anxiety and hedonic hunger increase.

Key words: Obesity, Depression, Hedonic Hunger

Yetişkin Bireylerde Obezitenin Depresyon, Anksiyete ve Hedonik Açlık Üzerindeki Etkisi

Öz

Amaç: Obezite insanların yaşam kalitesini olumsuz yönden etkilemektedir. Obezite ile depresyon anksiyete gibi psikiyatrik bozukluklar arasında ciddi bir bağlantı olduğu birçok çalışmada görülmüştür. Aynı zamanda obezite besinlere karşı haz duygusunu uyararak daha fazla besin tüketilmesine neden olmaktadır. Bu çalışmada obez olan bireylerde depresyon anksiyete ve hedonik açlık arasındaki ilişkilerinin araştırılması amaçlanmıştır.

Yöntem: Bu çalışmada nicel araştırma yöntemine bağlı olarak tarama modeli kullanılmıştır. Araştırmanın evren ve örneklem grubunu, Diyarbakır ilinde yaşayan 18-60 yaş aralığında, beden kitle indeksi 30 ve üstü 348 kadın 52 erkek toplam 400 gönüllü katılımcılardan oluşmaktadır. Veri toplama

tekniki olarak hazırlanan anket formu yüz yüze ve online olarak toplanmıştır. Katılımcılara, sosyo-demografik formu ve Beck depresyon ölçeği (BDÖ), Beck anksiyete ölçeği (BAÖ) ve Besin Göçü Ölçeği (BGÖ) uygulanmıştır.

Bulgular: Katılımcıların sosyo-demografik özelliklerine incelendiğinde %87 kadın %13 erkek olduğu ve %83 evli, %36 üniversite mezunu, %57,7 31-40 yaş aralığında olduğu görülmektedir. Katılımcıların genel alışkanlıkları ve sağlık durumlarına ilişkin; %9,7 sinin sürekli ilaç kullandıkları, katılımcıların %64,3'ünün sigara içmediği, %7,3'ünün alkol kullandığı, %65,3'ünün düzenli olarak fiziksel aktivite yaptığı, % 60'ının düzenli uyku saatine sahip olduğu bildirilmiştir. Beslenme alışkanlıklarına bakıldığında hamur işi ve şekerli ürünlerden enerjice zengin ağırlıklı beslendikleri görülmüştür. Kilo bakımından çalışmaya katılanların; %63,5 birinci derece Obez (BKİ 30-34,9), %26,2 ikinci derece Obez (BKİ 35-39,9), %10,2 üçüncü derece Obez (BKİ 40 ve üstü) belirlenmiştir. Erkeklerin kadınlara göre BKİ, depresyon, anksiyete düzeyleri ve hedonik açlık düzeyleri daha yüksek olduğu belirlenmiştir ($p \leq 0,05$). Karbonhidrat (hamur işi, şekerli) ve kızartma ağırlıklı beslenen katılımcıların BKİ, Depresyon düzeyi, Anksiyete Düzeyi ve Hedonik açlık düzeyi arttığı görülmüştür. Günlük ortalama uyku süresi bakımından katılımcıların %71,8'i 6-8 saat arası olduğu görülmüştür. 6-8 saat arası uyku süresine sahip olan katılımcıların, uyku süresi 2-4 saat sahip olan katılımcılara göre BKİ düzeylerinin daha düşük olduğu yani BKİ yüksek olan bireylerin daha az uydukları belirlenmiştir. Araştırmada vücut kitle indeksi yükseldikçe depresyon anksiyete ve hedonik düzeylerinin arttığı saptanmıştır.

Sonuç: Psikolojik rahatsızlıklar ve yeme davranışı arasında bağlantı olduğunu gösteren birçok çalışma bulunmaktadır. Depresyon, anksiyete gibi durumlarda kişilerin daha fazla yemek yeme eğiliminde olduğu görülmüştür. Hedonik açlıkta ihtiyaç duyulmadan sadece haz lezzet için gıda tüketim miktarının artışına bağlı olarak obezite derecesinin arttığı birçok çalışmada gözlenmiştir. Sonuç olarak bu çalışmada Obezite derecesi artıkça depresyon ve anksiyete ve hedonik açlık düzeylerinin arttığı sonucu ortaya çıkmıştır.

Anahtar sözcükler: Obezite, Depresyon, Hedonik Açlık

Entrance

Obesity; It is the presence of excess fat in the body that negatively affects health. In a broader sense, it is the increase in the number and growth of fat cells due to the energy intake being greater than the energy spent (Özpinar, 2011). Ideal body weight is based on a mathematical ratio between height and weight, we call it Body Mass Index (BMI). Individuals with a BMI over 30 kg/m² are defined as obese (Özpinar, 2011). Obesity may develop in different individuals for different reasons. Apart from overeating or malnutrition, genetic influence, inactivity, medication side effects and other chronic medical conditions are also factors that lead to the development of obesity. Obesity is an important public health problem in all developed and developing countries. According to the World Health Organization, the number of obese individuals is over 400 million worldwide. (Berberoğlu and Hocaoğlu, 2021). According to the 'Turkey Nutrition and Health Research-2010 Study' by the General Directorate of Primary Health Care of the Ministry of Health in Turkey, the obesity rate was found to be 20.5% in men, 41.0% in women and 30.3% in the general population (THSK, 2015). Depression is a mental disorder that manifests itself with symptoms such as fatigue, slow functioning, low energy, decreased confidence and self-esteem, and feelings of sadness, anxiety, and pessimism (Torun, 2020). Anxiety is a disorder that causes a person to have uncontrolled and excessive reactions to emotions such as worry, fear, and worry. There is a close relationship between anxiety, depression and eating disorders (APA, 2018). An individual with anxiety and depression loses control and can cause obesity by taking in more energy than he should in a short time (Sobutay, 2023:18-19). In a study showing a connection between psychological state and eating behavior, an increase in the amount of eating was observed during depression, distress and fatigue. In the same study, it was reported that the individual's mood eating behavior occurs with negative emotions such as anger, depression, anxiety and loneliness (Berberoğlu and Hocaoğlu, 2021). It has been reported that psychiatric problems are more common in obese individuals, and almost 25-30% of these obese individuals have depression or any psychiatric problems (Berberoğlu and Hocaoğlu, 2021). Many studies confirm the link between obesity and depression (Torun, 2020). Depression and anxiety disorders are more common in obese people. However, a recent study has shown a positive relationship between the severity of depression and emotional eating behavior. This shows that the link between obesity and depression is complex and multifaceted (APA, 2018). Obesity and depression pose a significant burden on the healthcare system and reduce life expectancy and quality. Obese people have a higher risk of depression and anxiety disorders than non-obese people. Depression and obesity lead to systemic diseases, reduce life expectancy and quality, and place a significant burden on healthcare services (WHO, 2023).

Known as hedonic hunger, it is the urge to enjoy and eat food. In hedonism, the number of fat cells increases due to energy intake much higher than the requirement, which causes obesity and causes serious health problems (Bozkurt and Yıldırım, 2022). The feeling of pleasure that occurs while eating depends on the perception of taste. Foods that taste good contain a lot of fat and sugar. Excessive consumption of such foods leads to obesity (Salbe et al. 2004, cited in Bülbül, 2021). In the study conducted by Ayyıldız et al. (2021), it was determined that there was a positive relationship with individuals' body mass index and hedonic hunger levels, and that BMI levels were also high in those with high hedonic hunger levels. At the same time, it has been observed in many sources that hedonic hunger will be associated with eating

disorders and psychiatric disorders (Nedime, Melis and Elif, 2020). Accordingly, when the literature was examined, there was no study examining the relationship between depression, anxiety and hedonic hunger in individuals with a BMI of 30 and above (obese), so the need to study this issue emerged.

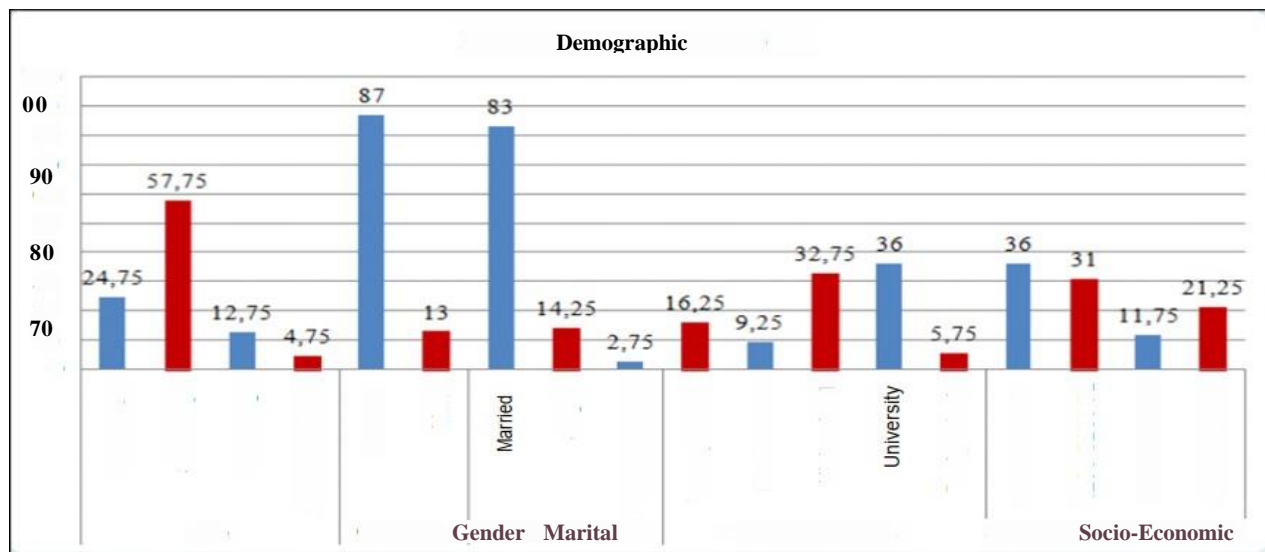
Materials and Methods

The population and sample group of the research consists of a total of 400 volunteer participants, 348 women and 52 men, aged 18 and over, with a body mass index of 30 and above, living in Diyarbakır. In this research, survey model was used depending on the quantitative research method. The survey form prepared as a data collection technique was collected face to face and online. The socio-demographic form, Beck depression scale (BDI), Beck anxiety scale (BAI) and food migration scale (FDI) were applied to the participants. The survey form in question consists of 77 questions and consists of 4 parts. These; socio-demographic form (20 questions), Beck depression scale (BDI) (21 questions) to measure the level of depression, Beck anxiety scale (BAI) (21 questions) to measure the level of anxiety, and Food Migration Scale (BDI) to measure the level of hedonic hunger.) (15 questions). Quantitative data analysis methods were used to analyze the research data. The data obtained in this context was analyzed with the SPSS27 package program. In order to determine the tests to be used to compare the data according to variables, the type of analysis was decided by checking whether the data distribution was normal or not. In the analyses, comparisons were made between the means using ANOVA test and independent sample t test, which are parametric statistical techniques.

Findings

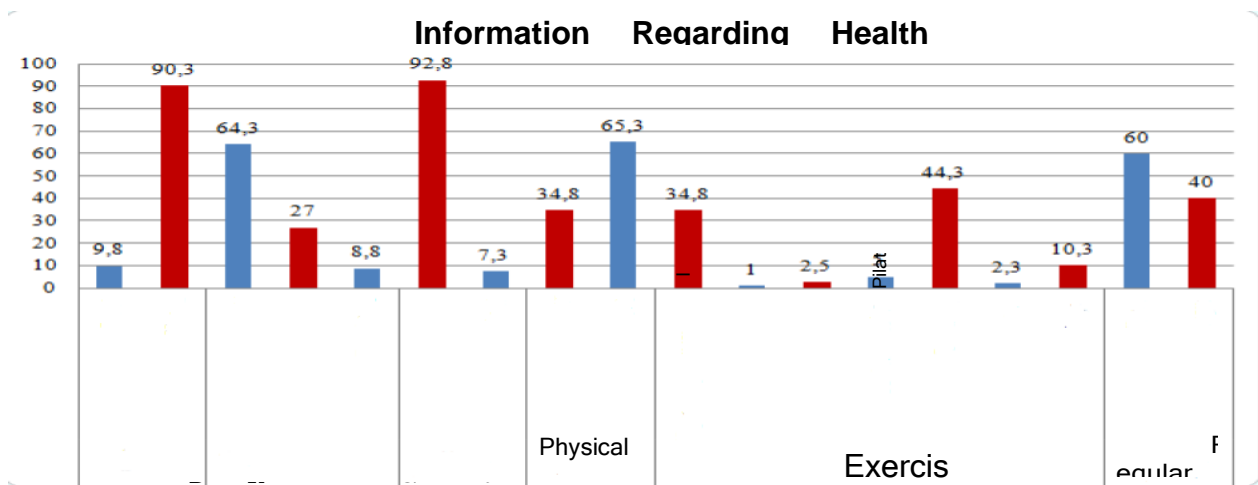
This research consisted of a total of 400 participants, 348 women and 52 men. When the socio-demographic characteristics of the participants are examined, it is seen that approximately 87% are female, 13% are male, 83% are married, 36% are university graduates, and 57.7% are between the ages of 31-40.

Table 1. Socio-Demographic characteristics of the participants



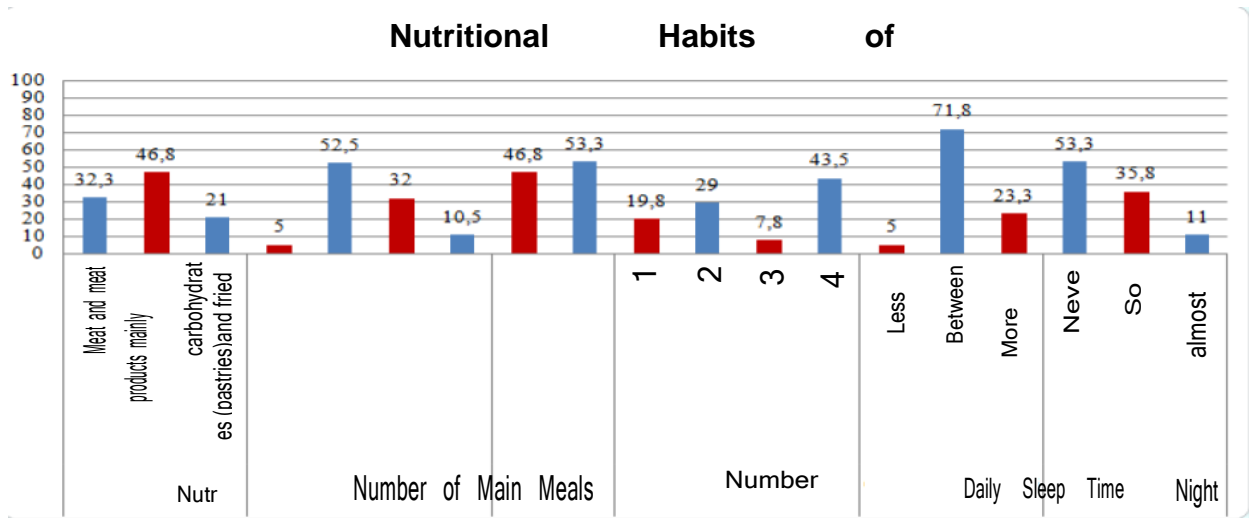
When the findings regarding the general habits and health status of the participants were examined, it was seen that 90.3% of the participants did not use medication constantly, 64.3% of the participants did not smoke, 7.3% used alcohol, and 65.3% did physical activity regularly. It was reported that 44.3% of the participants were constantly walking as physical activity, and 60% of the participants had regular sleep hours.

Table 2. Information on Participants' General Habits and Health Status



In terms of eating habits, it was stated that 32.3% of the participants ate mostly meat and meat products, 46.8% ate mostly carbohydrates (pastries and sugar) and fried foods, and 21% ate mostly vegetables and fruits. 52.5% of the participants eat 2 main meals a day and 32% eat 3 main meals a day. 46.8% of the participants stated that they ate snacks along with main meals. While 19.8% of the participants have one snack a day, 43.5% have 3 snacks a day. In terms of average daily sleep duration, 71.8% of the participants stated that they had a daily sleep duration of 6-8 hours, and 23.3% stated that they had a daily sleep duration of more than 8 hours. In terms of waking up at night and eating something, 35.8% of the participants stated that they woke up occasionally and 11% woke up and ate something almost every night.

Table 3. Nutritional Habits of Participants



Nutritional Habits of Participants Anxiety, depression and hedonic hunger levels of the participants according to their BMI levels were determined by ANOVA test. As a result of the analysis, it was determined that there was a significant difference in the scores of anxiety, depression and hedonic hunger levels ($p \leq .05$). Intragroup comparisons regarding the differences were made with the LSD test. As a result of the analysis, it was determined that the depression, anxiety and hedonic hunger levels of participants with 1st degree obesity were lower than those of participants with 2nd and 3rd degree obesity. While depression and anxiety levels are higher in individuals with Grade 2 obesity than in individuals with Grade 3 obesity, the level of hedonic hunger increases as obesity increases. Accordingly, it can be said that depression, anxiety and hedonic hunger levels are higher in participants with high obesity levels.

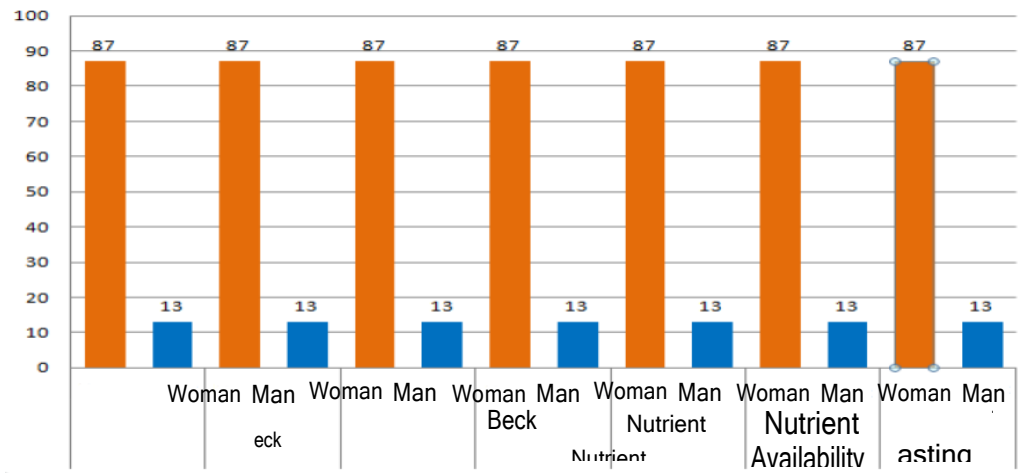
Table 4. Comparison of Participants' Anxiety, Depression and Hedonic Hunger Levels According to BMI Levels

Average				Standard deviation	sd.
1st Degree Obesity (bki 30-34.9)		254	13.661	12.65144	
		4			
Beck	Depression ^{2nd} Degree	105	23.200	13.44390	2 22,153 .0
Obesity	Scale (bki 35-39.9)	0			
3rd Degree Obesity (bki 40 and above)		41	20.536	13.01556	
		6			

	1st Degree Obesity	254	13.3150	12.76030		
	(bki 30-34.9)					
Beck	2nd Degree Obesity	105	23.0952	13.67094	2	22,717 .0
Anxiet						
yScale	(bki 35-39.9)					
	3rd Degree Obesity	41	20.2439	13.02264		
	(bki 40 and above)					
	1st Degree Obesity	254	48.9724	15.02130		
	(bki 30-34.9)					
Nutrient	2nd Degree Obesity	105	56.0476	15.07825	2	13,120 .0
Powe						
rScale	(bki 35-39.9)					
	3rd Degree Obesity	41	58.6829	14.17646		
	(bki 40 and above)					

The anxiety level, depression level and nutritional power levels of the participants according to their gender were analyzed with an independent sample t test. It was determined that there was a significant difference in the scores regarding BMI, depression level, anxiety level and nutritional power scale ($p \leq .05$). When the arithmetic mean scores regarding the difference were examined, it was determined that men had higher BMI, depression and anxiety and nutritional power levels than women.

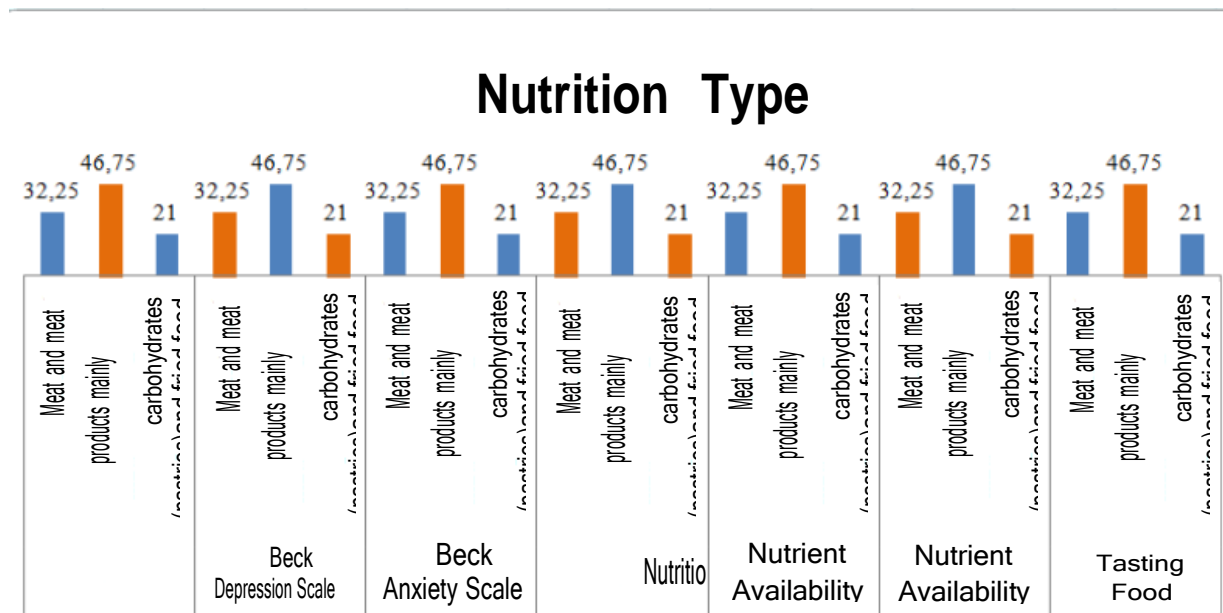
Table 5 Comparison of Participants' Anxiety Level, Depression Level and Hedonic Hunger Levels According to Their Gender



As a result of the analysis, the participants' nutrition type;

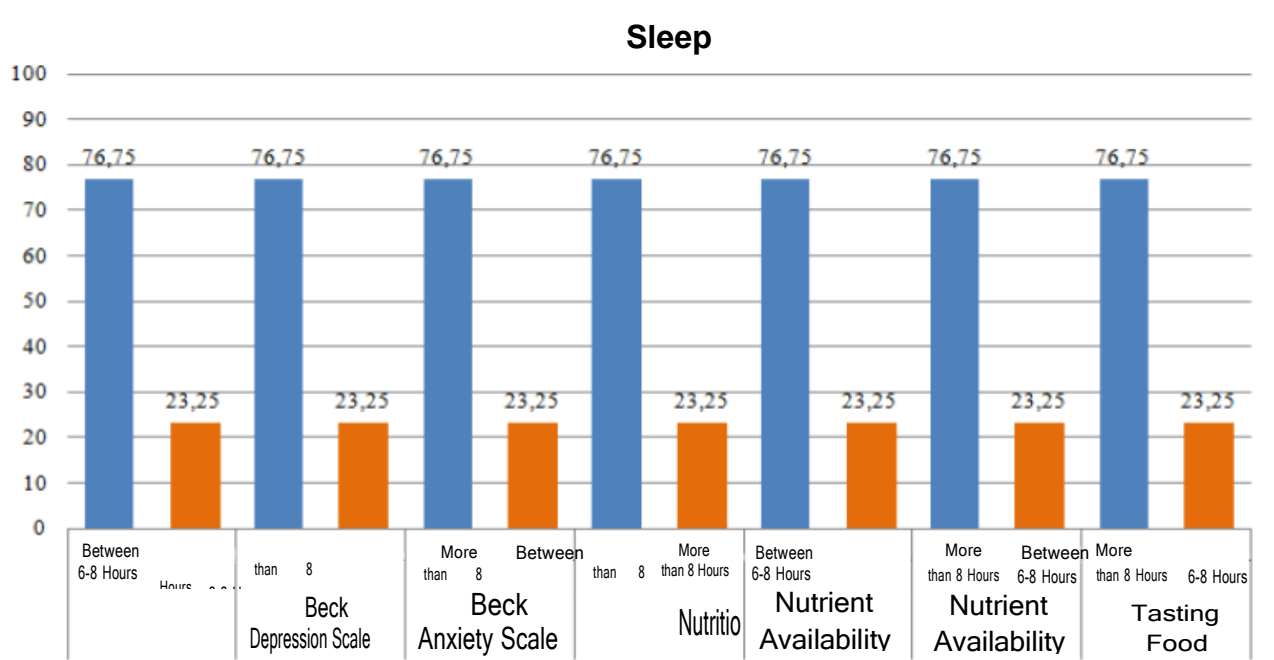
- Participants who ate mostly carbohydrates (pastries) and fried foods had higher BMI scores than those with other diets (F: 6.806; $p \leq .05$).
- Participants who ate mostly carbohydrates (pastries) and fried foods had higher depression levels, while participants who ate mostly vegetables and fruits had lower depression levels (F: 6717; $p \leq .05$).
- Participants who ate mostly carbohydrates (pastries) and fried foods had higher anxiety levels, while participants who ate mostly vegetables and fruits had lower anxiety levels (F: 7.359; $p \leq .05$).
- It was determined that the nutritional power (F: 13.560; $p \leq .05$) levels of participants who ate meat and meat products, carbohydrates (pastries and sugar) and fried foods were higher than those who ate mostly vegetables and fruits.

Table 6. Comparison of Participants' Anxiety Level, Depression Level and Hedonic Hunger Levels According to Nutrition Types



Comparison of the participants' anxiety level, depression level and hedonic hunger levels according to their sleep duration was carried out with ANOVA test. As a result of the analysis, it was determined that there was a significant difference in BMI scores ($p \leq .05$). On the other hand, it was determined that there was no significant difference in the depression level, anxiety level and nutritional power scale scores of the participants ($p > .05$). Intragroup comparisons regarding differences in BMI scores were made with the LSD test. As a result of the analysis, it was determined that the BMI levels of the participants with a sleep duration of 6-8 hours were lower than the participants with other sleep duration.

Table 7. Comparison of Participants' Anxiety Level, Depression Level and Nutritional Power Levels According to Their Sleep Duration



Argument

Obesity is an important public health problem in all developed and developing countries. Obesity may develop in different individuals for different reasons. The number of obese individuals is over 400 million all over the world (Bulut, 2023:24). According to the WHO 2022 European Obesity Report, our country has the highest overweight and obesity rates in Europe (Yılmaz, 2023). According to the latest data of the Turkey Health Survey, in 2022, 23.6 percent of women will be obese (BMI 30 and above) and

30.9 percent will be pre-obese (BMI 25-29), and 16.8 percent of men will be obese. and 40.4 percent of them were pre-obese (BMI between 25-29) (TUIK, 2023). It is reported that psychiatric problems are more common in obese individuals, and almost 25%-30% of obese individuals have depression or any psychiatric disorders (Berberoğlu and Hocaoglu, 2021). In many studies, it has been observed that obese individuals have higher levels of depression, anxiety and hedonic hunger than non-obese individuals.

The depressed individual loses control and may cause obesity by taking in more energy than he should in a short time (Sobutay, 2023:14). It is thought that there is a mutual interaction between depression and obesity, obesity increases the risk of depression, and depression affects the development of obesity (Erkul, 2018). A recently published study showed a positive relationship between the severity of depression and overeating behavior (Sobutay, 2023:18-19).

A study conducted by Schultes et al. (2010) found a positive relationship between BMI and depression states. In another study, depressive symptoms were more common in people with obesity (Sach et al. 2007). In a two-center study, 48 obese and 48 normal weight individuals were included. BDI (Beck depression scale) scores in the obese group were found to be statistically significant compared to the control group (Orhan, 2012). In a study conducted in Muğla to reveal the relationship between obesity and depression, depression and BMI were compared and the difference was found to be statistically significant. Depression scores of 2nd degree obese people were found to be higher than others (Erkul, 2018). In a study conducted in Poland with 512 patients receiving treatment for depression, all symptoms of depression were observed more clearly in those with a BMI over 25 kg/m². In other words, a significant relationship was observed between BMI and depression. Depression scores were found to be highest in people with 2nd degree obesity (Lojko et al. 2015). In this study, it was found that depression levels of the 2nd degree obese were higher than those of the 1st and 3rd degree obese. Accordingly, it has been seen that the above studies support the result of this study.

It has been reported that gender is one of the risk factors in the development of depression (Hacıhasanoğlu, 2010). The reasons why depression is more common in women include hormonal changes such as the menstrual period, pregnancy, puerperium, menopause, and the duties and expectations placed on women. (Durmuşçelebi, 2020). At the same time, as a result of a study conducted with 66 obese women in the Netherlands, it was determined that the reason for the high prevalence of depression in obese women was low physical activity and high energy intake through diet (Werrij, 2005). As a result of a study conducted in the USA with 40,086 individuals over the age of 18, it was determined that as the BMI value increases in women, depression increases more than in men (Bunsuz, 2018). In a study conducted with 230 students in Kilis, it was found that the average BDI score did not vary according to gender (Deveci, 2013). In the research conducted by Zhang et al. (Zhang, 2008); It has been shown that gender does not have a significant effect on depression score. Another study stated that anxiety and depression were less common in obese female individuals than in men (Değirmenci, 2015). In our study, it was found that men's depression level was higher than women.

In a study, it was observed that depression levels were higher in participants who ate foods rich in carbohydrates, including bagels, bulgur and fried foods. (Temizöz 2023). In one study, significant positive relationships were observed between the frequency of consumption of fast food such as pizza, hamburger, toast, wraps/doner, and the Beck depression and Beck anxiety scale scores. It has been observed that as the frequency of consumption of these foods increases, depression and anxiety scores also increase (Eminoğlu et al. 2020). In another study, fat intake was found to have a high depression level in individuals in the depression group, while protein, vegetable and fruit consumption was found to have a low depression level (Bayer, 2023). In this study, it was found that the depression levels of participants who ate mostly carbohydrates (pastries, sugary foods) and fried foods were higher, while the depression levels of participants who ate mostly vegetables and fruits were lower.

Individuals experience some hormonal problems due to lack of sleep time (Bulut, 2023:9). In this case, it is stated that an increase in BMI values may occur (Kristicevicvd., 2018). Current epidemiological studies also indicate that insufficient or irregular sleep is associated with the individual's risk of developing obesity, which triggers psychiatric problems (Hanne et al., 2013). Another study showed that insufficient sleep triggered depression (Hasözdemir, 2023). Similar to these results, this study also showed that participants who had enough sleep time had lower BMI levels, and BMI was higher in people with less sleep time. However, this study revealed that there was no significant difference in the participants' Depression and Anxiety scores in terms of sleep hours and duration.

Anxiety is a disorder that causes a person to have uncontrolled and excessive reactions to emotions such as anxiety, fear and worry. There is a close relationship between anxiety, depression and eating disorders (Sunderland et al., 2013). Anxiety causes uncontrollable behaviors in individuals due to fear and worry, and can be associated with individuals showing different eating behaviors by affecting their food choices. For this reason, managing anxiety, stress and depression has a very important place in affecting eating behaviors. A recent study reported a linear relationship between obesity and anxiety (Ma et al. 2020). In a study conducted by Ateş (2021), it was observed that there was a positive relationship between BMI and anxiety.

In another study conducted with the participation of 52 obese individuals and 43 non-obese individuals with normal BMI who applied to the Endocrinology Polyclinic, it was found that the depression and anxiety levels of obese individuals were higher than those of non-obese individuals. (Değirmenci, 2015). A study conducted to investigate the relationship between depression and anxiety in adult obese individuals included 60 obese individuals and 60 individuals with normal BMI values. Beck depression scale and Beck Anxiety scale scores of obese people and normal weight people were compared, but no statistically significant difference was observed between them (Durmuşçelebi, 2020). In another study conducted with 575 patients between the ages of 12 and 82 to investigate the relationship between BMI and depression and anxiety symptoms, it was observed that anxiety and depression levels increased as the BMI level increased. In other words, it was found that there is a significant positive correlation between BMI and Beck Depression Scale and Beck Anxiety Scale scores (Pahalı et al, 2018). In this study, it was found that anxiety levels increased as the degree of obesity increased. Accordingly, it has been seen that the above studies support the result of this study.

Anxiety disorder has been found to be associated with obesity in men and women (Mermi, 2014). In a study conducted with 340 people to determine the anxiety and depression levels of people attending a health center in Erzincan, the average depression score of women was found to be higher than that of men, although it was not statistically significant (Hacıhasanoğlu, 2010). Obese individuals overeat when they are anxious, and it has been reported that anxiety is more common in overweight men than in women (Pickering, 2007). Another study stated that anxiety

and depression were less common in obese female individuals than in males (Değirmenci, 2015). In our study, it was found that men's anxiety level was higher than women.

It has been seen in many studies that the type of malnutrition affects psychiatric diseases. In a recent study, the food consumption habits of the people participating in the study were taken into account. Consumption of carbohydrate-heavy and unhealthy foods and the severity of depression and anxiety were found to be significantly higher (Temizöz 2023). In another study, anxiety levels were found to be significantly higher in patients experiencing anxiety when they consumed foods with a high glycemic index, while anxiety levels were found to be lower in those who ate a diet rich in protein, vegetables and fruits (Bayer, 2023). In another study, significant positive relationships were observed between the frequency of consumption of fast food such as pizza, hamburger, toast, wraps/donairs and Beck depression and Beck anxiety scale scores. It has been observed that as the frequency of consumption of these foods increases, depression and anxiety scores also increase (Eminoğlu et al. 2020). In this study, it was found that the anxiety levels of participants who ate mostly carbohydrates (pastries, sugary foods) and fried foods were higher, while the depression levels of participants who ate mostly vegetables and fruits were lower.

The basis of hedonic hunger is the pleasure derived from the food eaten. The feeling of pleasure that occurs while eating depends on the perception of taste. Foods that taste good contain a lot of fat and sugar. Excessive consumption of such foods leads to obesity (Salbe et al., 2004; cited in Bülbül, 2021). High-calorie and delicious foods, easy access to them, large portions and changes in the food environment create an obese environment. Due to excessive consumption of salt, sugar and fat, obesity and obesity-related diseases may increase with the consumption of such foods (Lee and Dixon, 2017; cited in Gündüz et al., 2020). It is thought that many factors such as individual differences such as age, gender, BMI, individuals' eating habits, and the reward value of foods may affect hedonic hunger (Şahman, 2019). Studies report that obese adults experience more hedonic hunger than non-obese control groups. Similarly, in the study conducted by Ayyıldız et al. (2021), it was determined that there was a relationship between obesity and hedonic hunger. Accordingly, it has been determined that as hedonic hunger increases in individuals, obesity levels also increase. In this study, when the positive relationships between the variables were evaluated in general, a positive relationship was found between the body mass index and nutritional power scores of the participants. Accordingly, the findings of the study were similar to the findings of this study and supported the findings of this study.

When hedonic hunger and gender situations are examined, there are different data in the literature. In a study conducted with university students, no significant difference was found between GDS scores and gender (Lowe et al., 2009). In another study, women's BGS total score and subfactor scores were found to be higher than men, but no statistical significance was

observed (Coşkunsu, 2020). In the study, no significant difference was found between hedonic hunger and gender (Kılıç, 2022). In a study conducted on 315 adult individuals, it was determined that the nutritional power scale (BGI) total score and all sub-factor scores, hedonic

hunger states of women were higher than men (Şahman, 2019). In a study conducted by Shüz et al. (Schüz et al., 2015), it was found that although men's BSI scores were lower than women, it was not significant. In another study, although the total score of the nutrient power scale was higher in men than in women, no significant difference was found between them. In the study, Üçel (2016) found that hedonic hunger was higher in men than in women. In this study, it was found that men's hedonic hunger levels were higher than women.

In a study conducted with a total of 4774 people, it was revealed that there is a linear correlation between hedonic hunger and eating habits, consumption of high sugar foods and high fat salty foods (Yılmaz, 2023). In the study conducted by Şarahman (2019), it was determined that the hedonic hunger states of the participants were related to foods such as cake, fries and bread. Similar to the research findings, the study conducted by Ateş (2021) stated that a diet based on vegetables and fruits as a diet type has a reducing effect on hedonic hunger levels in individuals. In this study, it was concluded that participants who ate mostly carbohydrates (pastries, sugary foods) and fried foods had higher hedonic hunger levels than participants who ate other types of nutrition.

In a study, it was determined that hedonic hunger status differed across scales and added negatively to sleep quality, and that poor sleep affected individuals' body weight and had an impact on BMI. Thus, BMI has shown that it may have a relationship with hedonic hunger state and sleep quality (Gök, 2023). In the study conducted by Köybaşı (2020), it was stated that short sleep duration affected hedonic eating behaviors. (Bulut, 2023:9). In this case, it is stated that an increase in BMI values may occur (Kristicevic et al., 2018). In this way, sleep deficiency has a negative effect on BMI (Knutson and Van Cauter, 2008). Similar to these results, this study also showed that participants who had enough sleep time had lower BMI levels, and BMI was higher in people with less sleep time. The study revealed that there was no significant difference in the participants' hedonic hunger scores in terms of sleep hours and duration.

Conclusion

Obesity is an important global disease that reduces the quality of life and negatively affects the economy. It is especially important for obese people to return to their normal lives and improve their quality of life. In this study, it was determined that the obesity rates were high, especially as the degree of obesity increased, depression, anxiety and hedonic hunger levels increased. The issue here is whether the formation of obesity is due to these psychological problems or whether these problems arise after the formation of obesity in obese individuals. This issue is controversial. Regardless of the result, it is thought to be important to solve individuals' depression, anxiety and hedonic hunger problems, plan their nutritional habits accordingly and ensure their sustainability, improve their nutritional status in order to prevent health problems that may develop due to obesity, and achieve a healthy and permanent weight loss by applying an appropriate diet. Otherwise, the quality of life of obese individuals decreases and causes great losses to the country's economy.

SOURCE

Acar, T. (2016). "The relationship between subjective tinnitus and depression, anxiety and body mass index", Institute of Health Sciences, Sakarya University; 4:303-306.

Alkan, M. (2023). Evaluation of the relationship between social media and digital game addiction and anxiety during adolescence, Tokat Gaziosmanpaşa University Faculty of Medicine, Department of Family Medicine Specialization Thesis.

Annagür BB, Orhan FÖ, Özer A, TÜM L, Erhan Ç. (2012). Impulsivity and emotional factors in obesity: A preliminary study, Archives of Neuropsychiatry 49: 14-19.

Ateş, K.S. (2021). Evaluation of the relationship between intuitive eating and hedonic hunger status and diet quality, mental health and sleep quality. Master's Thesis, Istanbul Medipol University Institute of Health Sciences.

Ayyıldız, F., Ülker, İ., & Yıldırım, H. (2021). The reflection of the relationship between hedonic hunger and eating behavior on different body masses. Journal of Nutrition and Diet, 49(2), 9-17.

Bayer, Ao. (2023), The Relationship between Nutritional Status and Depression, Anxiety and Stress in Diabetic Patients Bahçeşehir University Postgraduate Education Institute Master's Thesis

Bektaşlı Köybaşı, G. (2020). Examination of sleep quality, depression and nutritional status of female university students living in a dormitory. Master's Thesis, Hasan Kalyoncu University Institute of Health Sciences.

Berberoğlu, Z. and Hocaoğlu, C. (2021). The Global Health Issue 'Obesity': A Current Review. Celal Bayar University Health Sciences Institute Journal, 8 (3), 543-552.

Bozkurt, O. and Yıldırım, H. (2022). The Relationship Between Hedonic Hunger and Obesity in Children and Adolescents. Gazi Journal of Health Sciences, 7 (2), 103-110.

Bulut, T. (2023). Evaluation of Health Beliefs and Physical Activity Participation of Obese and Obesity Risk Adults, (Master's Thesis), Gazi University Institute of Health Sciences.

Bunsuz E. (2018), Determining the relationship between waist circumference and body mass index and Beck Depression Inventory scoring in women. Erciyes University, Department of Nutrition and Dietetics Master's Thesis

Değirmenci T, Kalkan Oğuzhanoglu N, Sözeri Varma G, Özdel O, Fenkçi S. (2015) “Psychological symptoms and related factors in obesity”, Arch Neuropsychiatr

Deveci SE, Ulutaşdemir N, Açık Y. (2013) “The frequency of depression symptoms in students at a health school and the affecting factors”, Fırat Tıp Derg, 18(2):

Durmuşçelebi, E. (2020), Evaluation of the Relationship between Obesity and Depression and Self-Esteem Conditions, Okan University Health Sciences Institute, Department of Nutrition and Dietetics, Master's Thesis

Erkul C. (2018). The relationship between obesity and depression: A study on people diagnosed with obesity who applied to the diet clinic (Master's Thesis). Okan University, Department of Nutrition and Dietetics

Eroğlu, F. (2020). Determination of the relationship between hedonic hunger levels, nutritional status and sleep quality of men working office hours and shifts. Master's Thesis, Başkent University Institute of Health Sciences.

Gök, H (2023) Evaluation of the Relationship of Hedonic Hunger States of Adult Individuals with Sleep Quality AND Body Mass Index (BMI) Levels, Haliç University Nutrition and Dietetics Department Master's Degree

Hacıhasanoğlu R, Karakurt P, Yıldırım A, Uslu S. (2010) “Anxiety and depression in individuals with chronic diseases applying to a health center”, TAF Prev Med Bull, 9(3): 209-216.

Hanne K.J.G., Tanja C., Hursel R. (2013). Sleep duration, sleep quality and body weight: Parallel developments. Physiology & Behavior, 121: 112- 116. 127.

Hasösdemir,S(2023) The Effect of Relaxation and Breathing Exercises Applied at Home to Children Diagnosed with Epilepsy During the COVID 19 Pandemic on Quality of Life, Anxiety-Depression and Sleep Quality, Istanbul University Health Sciences Institute Master's Thesis

Hisli, N. (1988). A study on the validity of the Beck depression inventory. Journal of Psychology, 22 (6): 118-126.

Kaplan,İ.(2022), The Relationship between Psychological Well-Being in Women and Perceptions of Gender Roles,<https://www.tuicakademi.org/kadinlarda-psikoloji-iyi-olusun-toplumsal-cinsiyet-rollerini-iliskin-algilar-ile-iliskisi/> (EAccess Date: 02.08.2023)

Kılıç F, (2022), Examining the Factors of Hedonic Hunger States in Obese and Non-Obese Individuals, Haliç University Nutrition and Dietetics Department Master's Degree

Knutson K. L., Van Cauter E. (2008). Associations between sleep loss and increased risk of obesity and diabetes. *Annals of the New York Academy of Sciences*, 1129: 287-304.

Kristicevic T., Stefan L., Sporis G. (2018). The associations between sleep duration and sleep quality with body-massindex in a large sample of young adults. *Int J EnvironRes Public Health*, 15(4): 758.

Lojko D, Buzuk G, Owecki M, Ruchala M, Rybakowski JK.(2015) "Atypical features in depression: Association with obesity and bipolar disorder", *Journal of Affective Disorders*, 185: 76-80.

Manasse, SM, Espel, HM, Forman, EM, Ruocco, AC, Juarascio, AS, Butryn, ML, ... & Lowe, MR (2015). The independent and interacting effects of hedonichunger and executive function on bingeeating. *Appetite*, 89, 16-21.

Medical

Academy

(2023).<https://www.medikalakademi.com.tr/cocukluk-cagi-obezite-arastirmasi-cosi-turkiyesisma> n/(Access Date: 19.07.2023).

Milaneschi Y., Hoogendijk W., Lips P., Heijboer A., Schoevers R., Van Hemert A. et al. (2014). The associationbetweenlow vitamin D and depressive disorders. *Molecular psychiatry*, 19(4).

Musetti, A., Cattivelli, R., Guerrini, A., Mirto, AM, Vailati, FR, Varallo, G., Castelnuovo, G., and Molinari, E. (2018). Cognitive-behavioral therapy: Current paths in the management of obesity. *CognitiveBehavioralTherapy and Clinical Applications*, 8, pp. 150-160.

Nedime, G., Melis, A., Elif Naz S. (2020). 'Hedonic Hunger" *Izmir Democracy University*; 3, 1, 80-96.

Osman MERMİ1 (2018) Obesity and Psychiatry *Firat Medical Journal/Firat Med*

Özpinar, H. (2011). 'Basic Principles of Nutrition and Diet' *Istanbul Medikal Publishing*

Pickering RP, Grant BF, Chou SP, et al.(2007) Are overweight, obesity, and extreme obesity associated with psychopathology? Results from the national epidemiological survey on alcohol and related conditions, *J Clin Psychiatry* 68; 998- 1009.

Prohan M., Amani R., Nematpour S., et al. (2014). Total antioxidant capacity of diet and serum, dietary antioxidantvitaminsintake, and serum hs-CRPllevels in relation to depression scales in university male students. *RedoxRep.*, 19:133-39.

Sachs-Ericsson N, Burns AB, Gordon KH, Eckel LA, Wonderlich SA, Crosby RD, Blazer DG.(2007) “Body mass index and depressive symptoms in older adults: The moderating roles of race, sex, and socioeconomic status”, *The American Journal of Geriatric Psychiatry*, 15(9): 815–825.

Schultes, B., Ernst, B., Wilms, B., Thurnheer, M., &Hallschmid, M. (2010). Hedonichunger is increased in severely obese patients and is reduced after gastric bypass surgery. *The American journal of clinical nutrition*, 92(2), 277-283.

Schüz, B., Schüz, N., and Ferguson, S.G. (2015). It's the power of food: individual differences in food cue responsiveness and snacking in everyday life. *International Journal of Behavioral Nutrition and Physical Activity*, 12 (49), 1-8

Sobutay, S. (2023). Predictors of Eating Attitudes in Adults: Disapproving Environment in Childhood, Impulsivity, Depression, Anxiety and Psychological Resilience, (Unpublished Master's Thesis), Marmara University Institute of Social Sciences.

Şahahman, C. (2019). Examination of Factors Affecting Hedonic Hunger States of Adult Individuals. Başkent University Institute of Health Sciences, Nutrition and Dietetics Master's Thesis.

Üçel U.İ. (2016). Etiology of depression and the role of cytokines. *Düzce University Health Sciences Institute Journal*, 6(1):41-45.