

Relationship Between Night Eating Disorders and Obesity

Gece Yeme Bozuklukları ile Obezite Arasındaki İlişki

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Abstract

Objectives: Today, with the advance of technology, increasing factors that facilitate daily life have reduced the movement of people, leading to weight gain and obesity. Obesity is a growing problem in the world. Night eating disorders, (NED)s were classified as night eating syndrome and sleep related eating disorder. In the study, we aimed to investigate the relationship between night eating disorders and obesity.

Materials and Methods: The study was performed with 290 participants who have inclusion criteria and applied to Family Medicine Clinic for any reason between January-March 2015. Inclusion criteria were being over 18 years of age, having no psychological or chronic illness and accepting to answer the questionnaire. Participants who worked at night, had physical and psychological problems and had chronic illness were excluded from the study. The questionnaires were performed by doctors with face-to-face interview technique with the participants. In addition to socio-demographic factors, the criteria for NEDs were investigated and recorded. After this; the weight (kg), height (cm) and waist circumference (WC; cm) of all participants were measured. Participants were divided into two groups, according to BMI [obese (BMI ≥ 30 kg/m²) and non-obese (BMI < 30 kg/m²)] and analyzed. A p value of $p \leq 0.05$ was considered to be statistically significant.

Results: Although there was no relation between gender, education status, economic status and night eating syndrome; age and obesity were related with night eating syndrome ($p < 0.001$). There was no relation between age, gender, education status, economic status and sleep related eating disorder but obesity was related sleep related eating disorder ($p < 0.001$).

Conclusion: We found that, there is a strong relationship between NEDs and obesity. For this reason, we think that the questioning of NEDs in obese patients is important for treatment.

Key words: Feeding and eating disorders, obesity, eating behavior, night eating disorders

Öz

Amaç: Günümüzde teknolojinin ilerlemesiyle günlük yaşamı kolaylaştıran faktörlerin artması kişilerin hareketini azaltmıştır. Bu da kilo alımı ve obeziteye neden olmuştur. Obezite dünyada giderek artan bir sorundur. Gece yeme bozuklukları; gece yeme sendromu ile uykuyla ilişkili yeme bozukluğu olarak sınıflandırılır. Çalışmada, gece yeme bozuklukları ile obezite arasındaki ilişkiyi araştırmayı amaçladık.

Materyal ve Metot: Çalışma Ocak-Mart 2015'te herhangi bir sebepten dolayı Aile Hekimliği Kliniğine müracaat eden ve uygun kriterleri bulunan 290 katılımcı ile gerçekleştirildi. Dâhil etme kriterleri; 18 yaş üstü olma, psikolojik veya kronik hastalığı olmama ve anketi cevaplamayı kabul etme idi. Gece vardiyasında çalışan, fiziksel ve psikolojik rahatsızlıkları olan ve kronik hastalığı olan katılımcılar çalışmadan dışlandı. Anketler doktorlar tarafından katılımcılar ile yüz yüze görüşme yöntemiyle dolduruldu. Sosyo-demografik faktörlere ek olarak, gece yeme bozuklukları kriterleri sorgulandı ve veriler kaydedildi. Sonrasında katılımcıların boy, kilo ve bel çevresi ölçüldü. Hastalar beden kitle indekslerine göre 2 gruba ayrılarak [obez (BKİ ≥ 30 kg/m²) ve obez değil (BMI < 30 kg/m²)] analiz edildi. $p \leq 0,05$ anlamlı kabul edildi.

Bulgular: Cinsiyet, eğitim durumu, ekonomik durum ile gece yeme sendromu arasında herhangi bir ilişki olmamasına rağmen; yaş ve obezite gece yeme sendromu ile ilişkili bulundu ($p < 0,001$). Yaş, cinsiyet, eğitim durumu, ekonomik durum ile uyku ile ilişkili yeme bozukluğu arasında bir ilişki saptanmadı. Obezite, uyku ile ilişkili yeme bozukluğu ile ilişkili bulundu ($p < 0,001$).

Sonuç: Gece yeme bozuklukları ile obezite arasında güçlü bir ilişki bulduk. Bu nedenle obez hastalarda gece yeme bozukluklarının sorgulanmasının tedavi açısından önemli olduğunu düşünmekteyiz.

Anahtar kelimeler: Beslenme ve yeme bozuklukları, obezite, yeme davranışı, gece yeme bozuklukları

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Introduction

Today, with the advance of technology, increasing factors that facilitate daily life have reduced the movement of people, leading to weight gain and obesity. Obesity is a growing problem in the world. In 2014, 39% of men and 40% of women older than 18 years were overweight [body mass index (BMI) ≥ 25 kg/m²] and 11% of men and 15% of women were obese (BMI ≥ 30 kg/m²). Thus, nearly 2 billion adults worldwide were found to be overweight, and of these, more than half a billion were found to be obese.¹ Obesity is very important because it increases mortality and morbidity.

Multiple factors have been found responsible for causing obesity, including abnormal feelings of hunger, inactivity, eating disorders and illness. Eating disorders were one of the reasons that cause obesity. Abnormal eating during the main sleep period is termed as Night Eating Disorder (NED).

In this study; we investigated the relationship between NEDs and obesity.

Materials and Methods

Participants

The study was performed with 290 participants who have inclusion criteria, applied to the Family Medicine Clinic for any reason between January-March 2015. Inclusion criteria were; being over 18 years of age, having no psychological or chronic illness and accepting to answer the questionnaire. Participants who worked at night, had physical and psychological problems and had chronic illness were excluded from the study.

Instruments

In addition to socio-demographic factors, the criteria for NEDs were investigated and recorded. Education level is divided into two groups as less educated (lower than high school), highly educated (high school and over). Economic status is defined as ≤ 1000 TL/ month and >1000 TL/ month (The separation made according to the minimum wage of Turkey in 2015).

The questionnaires were performed by doctors with face-to-face interview technique with the participants. After this; the weight (kg), height (cm) and waist circumference (WC; cm) of all participants were measured. Participants were divided into two groups, according to BMI [obese (BMI ≥ 30 kg/m²) and non-obese (BMI <30 kg/m²)] and gender.

Night Eating Disorders

NEDs has been categorized as either night eating syndrome (NES) or sleep-related eating disorder (SRED). NES was first described in 1955 by Stunkard and colleagues as resistant obesity with morning anorexia, evening hyperphagy and insomnia.² This initial definition of NES was made in patients with persistent obesity. To propose

standardized criteria for the diagnosis of NES, an international research meeting was held in April 2008.³ In contrast, SRED was first described relatively recently in 1991.⁴ The current diagnostic criteria for SRED are according to a 2005 publication on the international classification of sleep disorders.⁵ The Night Eating Questionnaire is currently used to diagnose NEDs. The reliability and validity of the Turkish version of the Night Eating Questionnaire has been confirmed in a psychiatric outpatient population, with good diagnostic performance and a high internal consistency.⁶

Procedure

The data were analysed using a statistics program (SPSS Statistics for Windows, IBM Inc.; Version 16.0. Armonk, NY, ABD). According to the Shapiro–Wilk test, our study population had an abnormal distribution ($p < 0.001$). The Mann–Whitney U test was used to compare independent variables between groups. The Chi-square test was used to analyse differences between two non-continuous variables. For continuous variables, the correlation test was used. A p value of ≤ 0.05 was considered to be statistically significant. The Cronbach alpha of the questionnaire was 0.627, according to reliability analysis.

Results

The distribution and relations of age, education status, economic status and means of measurements (weight, height, BMI and WC) of both obese and non-obese participants are shown in Table 1. There was no relationship between obesity and age or economic status ($p = 0.117$ and $p = 0.131$, respectively). Notably, obesity was more prevalent in less educated people than highly educated people ($p = 0.010$).

Table 1. The distribution of age, education status and economic status of obese and non-obese participants

	Obese		Non-obese		P
	n	%	n	%	
Age (years)					
18–40	61	42.10	72	49.70	0.117
41–64	62	42.80	57	39.30	
≥65	22	15.10	16	11.0	
Education					
Less Educated	86	59.30	67	46.20	0.010
Highly Educated	59	40.70	78	53.80	
Economic Status					
≤1000 TL/ month	27	18.60	40	27.60	0.131
>1000 TL/ month	118	81.40	105	72.40	

In total, 111 (38.20%) participants (87 obese, 78.30%; 24 non-obese, 21.70%) had NES. The distribution of age, gender, education status, economic status and obesity of participants grouped by SRED and NES are shown in Table 2. There was no significant relationship between gender, education status, economic status and NES. Only obesity was related with NES ($p < 0.001$). Similarly, central obesity, as measured by WC, was also associated with NES in both genders ($p = 0.001$ for males, $p = 0.004$ for females).

Only 23 participants had SRED. There was no significant relationship between age, gender, education status, economic status and SRED ($p = 0.967$, $p = 0.514$, $p = 0.706$ and $p = 0.498$, respectively). Obesity was related with SRED ($p < 0.001$), although there was one participant with SRED who was not obese. Moreover, central obesity was present in all participants with SRED in both genders. Notably, a total of 22 participants with SRED also had NES ($p < 0.001$).

Table 2 The distribution of age, gender, education status, economic status and obesity in participants with SRED and NES.

	NES		P	SRED		P
	n	%		n	%	
Age (years)						
18-40	61	55.00	0.1	10	43.50	0.967
41-64	42	37.80		10	43.50	
≥65	8	7.20		3	13.00	
Education						
Less Educated	56	51.50	0.535	13	56.50	0.706
Highly Educated	55	49.50		10	43.50	
Economic Status						
≤1000 TL/ month	23	20.70	0.448	4	17.40	0.498
>1000 TL/ month	88	79.30		19	82.60	
Gender						
Male	57	51.40	0.717	13	56.50	0.514
Female	54	48.60		10	43.50	
BMI (kg/m²)						
Obese	87	78.40	< 0.001	22	95.70	< 0.001
Non-obese	24	21.60		1	4.30	
WC (cm)						
Male ≥94	43	75.40	0.001	13	100	0.001
Female ≥80	45	83.30	0.004	10	100	0.028

NES: Night Eating Syndrome SRED: Sleep-Related Eating Disorder BMI: Body Mass Index
WC: Waist Circumference

Discussion

There have been many studies investigating NES in literature. In 2004, a study with 80 participants (40 obese and 40 non-obese) showed that NES has strikingly similar characteristics in obese and non-obese subjects.⁷ In this study, NES was observed both in obese and non-obese groups.

A study performed in 2014 showed that NES is associated with higher body mass index in participants >30 kg/m² and <61 years of age.⁸ In contrast, there was no relationship between age and NES in this study, although most participants with NES were under the age of 65 years.

In a study investigating heritability estimates for NES in both genders, it was shown that the prevalence of NES is greater in males.⁹ Similarly, in the present study, NES was

more prevalent in males than in females. This could be related with men's more active work life than women and possible bad eating habits at work.

In a study performed in patients with restless leg syndrome, the prevalence of NES was found to be 31%, and patients with NES had higher BMI ranges (28.3 ± 4.1 vs. 26.2 ± 3.9 kg/m², $p = 0.037$).¹⁰ Another study has shown that in the general population, the prevalence of NES is 1.50%, whereas it is 15% among obese individuals and 42% among morbidly obese individuals.¹¹ In the present study, the prevalence of NES was 38.30%, with a mean BMI of 29.27 ± 6.68 kg/m². The prevalence of NES is found to be greater compared to the other study. This is probably because all our participants lived near our clinic and there were many textile firms that work with shift system. Shift system cause bad eating habits not only for the worker, but also their families.

In the literature, there are limited number of studies on the relationships between WC and NES and SRED. In the present study, we found a strong relationship between WC and SRED and NES in both genders. This is because a higher WC is also associated with obesity as determined by BMI. This result confirms the relationship with obesity as measured by BMI and NED.

There are limited number of studies on the prevalence of SRED in the general population. According to a study, the prevalence of NEDs was shown to be 8.70%–16.70%.¹² In the present study, the prevalence of SRED was 7.30%, which is similar to previous studies.¹³ SRED has mostly been observed in women, with a prevalence ranging from 66% to 83%.⁵ However, in the present study, we found that the prevalence in women was 43.50%. Different sociocultural factors and the characteristics of the study groups may account for the differences in the results.

In a study in obese people (mean BMI, 55 kg/m²), the percentage of people with NES was found to be 51%, and according to that study, the increase in obesity is a risk for NES.¹⁴ Similarly, in a 2014 study, 41.10% ($n = 14$) of patients with SRED were overweight or obese.¹⁵ In the present study, 95.65% of participants who had SRED were also obese. Correspondingly, 78.37% of participants who had NES were obese. Notably, the prevalence of obesity was 100% among participants with both NES and SRED. There were studies that showed eating close to bed-time might enhance the efficiency with which fat is stored and promote increases in body weight and body fat and night time blood leptin levels are lower in a small sample of night-eaters.^{16,17} These literatures explain the relation between obesity and NEDs.

In conclusion, according to the results of our study, there is a strong relationship between NED and obesity. People who are younger, less educated and male and those who have a high BMI were related with NED. Therefore, the eating habits of all obese subjects should be investigated, and if NED is present, tackling this problem should be the first step of treatment.

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