

# The Frequency of Night-Eating Syndrome in People Aged 18-65 Who Admitted to a Family Medicine Clinic of a Tertiary Hospital

Murat Dicle, Süleyman Görpelioglu, Cenk Aypak

<https://doi.org/10.33880/ejfm.2019080305>

Original Research / Orijinal Araştırma

## AUTHORS / YAZARLAR

**Murat Dicle**  
(Corresponding Author)

dicle-murat@hotmail.com

Department of Family  
Medicine, University of  
Health Sciences Dışkapı  
Training and Research  
Hospital, Ankara  
ORCID iD:  
0000-0002-5640-6144

**Suleyman Gorpelioglu**  
Department of Family  
Medicine, University of  
Health Sciences Dışkapı  
Training and Research  
Hospital, Ankara  
ORCID iD:  
0000-0003-4579-5970

**Cenk Aypak**

Department of Family  
Medicine, University of  
Health Sciences Dışkapı  
Training and Research  
Hospital, Ankara  
ORCID iD:  
0000-0002-8381-790X

## ABSTRACT

**Aim:** Night Eating Syndrome is thought to pose a risk for the development of cardiovascular system, endocrinological and psychiatric diseases. The aim of our study was to investigate the frequency of night-eating syndrome and risk factors related to night eating syndrome.

**Methods:** This cross-sectional, descriptive study was carried out among 525 people who admitted to the Family Medicine Clinic of a tertiary hospital between 01 October and 30 November 2018. The night-eating questionnaire was applied to the participants using face-to-face interview. Persons with a psychiatric disorder, who have a history of chronic medication or disease, who have alcohol and drug addiction and who are working on the night shift were excluded from the study. p values < 0.05 were considered as statistically significant.

**Results:** Fifty-one (9.7%) of the 525 patients admitted to our clinic met the criteria of Night Eating Syndrome. In our study, there were statistically significant difference between night eating syndrome and non-night eating syndrome groups with respect to smoking status and body mass index.

**Conclusion:** Night eating syndrome is a hidden public health problem which is related to cardiovascular system diseases, diabetes mellitus and psychiatric disorders besides obesity. Because of the presence of serious health problems associated with night eating syndrome, it is very important to determine night eating syndrome in primary care.

**Keywords:** Night-Eating Syndrome, obesity, smoking, body mass index

## Bir Üçüncü Basamak Hastanenin Aile Hekimliği Kliniğine Başvuran 18-65 Yaşındaki İnsanlarda Gece Yeme Sendromu Sıklığı

### ÖZ

**Amaç:** Gece Yeme Sendromunun kardiyovasküler sistem, endokrinolojik ve psikiyatrik hastalıkların gelişimi açısından risk oluşturduğu düşünülmektedir. Çalışmamızın amacı, gece yeme sendromunun sıklığını ve gece yeme sendromu ile ilgili olabilecek risk faktörlerini incelemektir.

**Yöntem:** Kesitsel, tanımlayıcı tipteki bu çalışma, 01 Ekim-30 Kasım 2018 tarihleri arasında üçüncü basamak bir hastanenin Aile Hekimliği Kliniğine başvuran 525 kişi arasında yapıldı. Veriler, katılımcılara yüz yüze uygulanan Gece Yeme Anketi ile elde edildi. Psikiyatrik hastalığı olan, gece vardiyasında çalışan, alkol veya madde bağımlılığı olan, kronik hastalığı ya da kronik ilaç kullanım öyküsü olanlar çalışmaya dahil edilmedi. p<0,05 istatistiksel olarak anlamlı kabul edildi.

**Bulgular:** Çalışmaya alınan 525 hastanın %9,7'si (n=51) gece yeme sendromu kriterlerini karşılıyordu. Sigara içme durumu ve beden kitle indeksi ile ilgili olarak gece yeme sendromu ve gece yeme sendromu olmayan gruplar arasında istatistiksel olarak anlamlı fark bulundu. Gece yeme sendromu ile cinsiyet, eğitim durumu veya medeni durum arasında istatistiksel olarak anlamlı bir ilişki bulunamadı.

**Sonuç:** Gece yeme sendromu, obezitenin yanı sıra kardiyovasküler sistem hastalıkları, diabetes mellitus ve psikiyatrik bozukluklarla ilişkili gizli bir halk sağlığı problemidir. Gece yeme sendromuna bağlı ciddi sağlık problemlerinin oluşma riski nedeniyle, birinci basamakta gece yeme sendromunu belirlemek çok önemlidir.

**Anahtar kelimeler:** gece yeme sendromu, obezite, sigara içme, beden kitle indeksi

Date of submission  
19.12.2018

Date of acceptance  
17.09.2019

**How to cite / Atıf için:** Dicle M, Gorpelioglu S, Aypak C. The frequency of night-eating syndrome in people aged 18-65 who admitted to a family medicine clinic of a tertiary hospital. Euras J Fam Med 2019;8(3):121-5. doi:10.33880/ejfm.2019080305

**Conflict of interest:** No conflict of interest was declared by the authors.

**Financial disclosure:** No financial disclosure was declared by the authors.

## Introduction

Night Eating Syndrome (NES) was first described by Stunkard in 1955 as a disorder in treatment-resistant obesity patients characterized by morning anorexia, evening hyperphagia and insomnia (1). Although it was first described in obese individuals, it has been proven that it can be seen in people with normal weight (2). Presence of morning anorexia, eating sparingly in breakfast (e.g., only coffee or juice) or omitting breakfast, evening hyperphagia which is described as at least having 25% of food intake after the evening meal and insomnia or sleep withdrawal at least 3 times a week are defined as diagnostic criteria of NES (3). Individuals with NES consume a significant part of their food intake after the evening meal, awaken more often during the night and spend longer time to sleep again after awakening (4). The prevalence of NES was reported to be 1.5-4.3% in the adult population (5,6). Night-eating syndrome is a health problem which is related to cardiovascular system diseases, diabetes mellitus and psychiatric disorders besides obesity. The aim of this study was to determine the frequency of night-eating syndrome and to determine the relationship between night eating syndrome and sociodemographic characteristics which may be risk factors such as smoking status, marital status, gender and body mass index (BMI).

## Methods

This descriptive study was conducted among 525 patients aged between 18-65 years who were admitted to the Family Medicine Clinic of a tertiary hospital, between 01 October 2018 and 30 November 2018. Data were obtained by a questionnaire which was applied to participants face to face. This questionnaire was including socio-demographic features, weight, height, body mass index and 'Night Eating Questionnaire' (NEQ) (7). To evaluate NES, the NEQ was used. NEQ measures the symptoms of NES with 14 items. With these 14 items, four factors of NES were requested: nocturnal eating, evening hyperphagia, morning anorexia and sleep disturbance. The first 9 questions in the questionnaire were filled by all participants. Participants who did not wake up or make a snack for the next questions were told not to

continue. Questions 10 to 12 are for participants with night waking, questions 13-14 are for participants with night snacks. Questions other than the 7th question are 5-point Likert-type scale and scored between 0-4. Participants without a mood change within the day, receive zero points from the seventh question. The first, fourth and fourteenth items are scored reversly. The thirteenth question is not scored. The clinical cut-off score used for the questionnaire was 30. The reliability and validity of Turkish version of NEQ were done by Atasoy et al (8,9).

Persons with a psychiatric disorder, who have a history of chronic medication or disease, who have alcohol and drug addiction and who are working on the night shift were excluded from the study.

All statistical analyses were performed using SPSS for Windows v.21 software program (SPSS Inc., Chicago, IL, USA). Descriptive statistical methods in the evaluation of demographic data; frequency, percentage, mean, standard deviation, median were used. The compatibility of data with normal distribution was examined with the Kolmogorov-Smirnov test. Quantitative variables were stated as mean  $\pm$  standard deviation (SD) and median (min-max), and categorical variables as number (n) and percentage (%). The Chi Square test was applied to compare relationship between categorical outcomes. Correlation test was used to examine the relationship between numeric variables. A value of  $p < 0.05$  was considered statistically significant.

## Results

A total of 525 participants, 266 females (50.66%) and 259 males (49.33%) who applied to Ankara Dışkapı Yıldırım Beyazıt Training and Research Hospital Family Medicine Clinic were enrolled in the study. The mean age of the participants was  $38.50 \pm 11.95$  years ( $39.70 \pm 11.28$  for females and  $37.27 \pm 12.50$  for males). The mean BMI was  $26.05 \pm 3.73$  for males and  $24.59 \pm 4.21$  for females. Forty-seven of the males (18.1%) and 34 of the females (12.8%) were obese. Education level, smoking and marital status of the participants are shown in Table 1.

**Table 1.** Education level, smoking and marital status of the participants

		Male (n=259)	Female (n=269)
Education Level	Primary school	26 (10%)	36 (13.5%)
	Middle school	37 (14.3%)	23 (8.6%)
	High school	100 (38.6%)	100 (37.6%)
	University	96 (37.1%)	107 (40.2%)
Marital Status	Married	149 (57.5%)	169 (63.5%)
	Single	110 (42.5%)	97 (36.5%)
Smoking	Yes	150 (57.9%)	95 (35.7%)
	No	109 (42.1%)	171 (64.3%)

The median NEQ scores of the male participants was 13.00 (min 4.00 and max 46.00) and median NEQ scores for females was 13,00 (min 0.00 and max 40.00). Fifty-one (9.7%) of the 525 patients admitted to our clinic met the criteria of NES. Twenty-eight (10.5%) of them were female and 23 (8.9%) of them were male. In our study, there were statistically significant difference between NES and non-NES groups with respect to smoking status and BMI. A statistically significant difference was found between NES and non-NES groups in both male and female obese participants ( $p < 0.001$ ,  $r = 0.258$ ). While there was a statistically significant relationship between smoking females and NES ( $p = 0.012$ ), there was no statistically relationship in males ( $p = 0.236$ ). Also there was no statistically significant association between NES and gender ( $p = 0.524$ ), educational status ( $p = 0.201$ ) or marital status ( $p = 0.241$ ) of the participants (Table 2).

### Discussion

Although NES has been firstly identified in treatment-resistant obese patients by Stunkard in 1955, NES is thought to be associated with many other diseases and personality traits. The prevalence of NES was 1.5-4.3% in studies conducted on the general population (5,6). In a study conducted with the participation of 454 adult people in Oman, it was shown that 1.5% of the respondents met the criteria of NES (10). In a study conducted with the participation

of 300 females in various areas of Amritsar, it was found that 3% of the participants had NES (11). In another study conducted with the participation of 19861 university students in USA, it was shown that 1.2% of the participants had NES (12). The frequency of NES among adult people in our study was 9.7%. This was higher than other studies in the literature. This situation can be explained by the different nutritional habits and socio-cultural characteristics of our society.

**Table 2.** Some sociodemographic characteristics of participants with and without Nes

		NES +	NES -	n	P
Smoking status	Yes	32 (13.1%)	213 (86.9%)	245 (46.7%)	0.015
	No	19 (6.8%)	261 (93.2%)	280 (53.3%)	
Obesity	Yes	26 (5.0%)	55 (10.5%)	81 (15.5%)	0.000
	No	25 (4.8%)	419 (79.8%)	444 (84.5%)	
Gender	Male	23 (8.9%)	236 (91.1%)	259 (100%)	0.524
	Female	28 (10.5%)	238 (89.5%)	266 (100%)	
Marital status	Single	24 (4.6%)	183 (34.9%)	207 (100%)	0.241
	Married	27 (5.1%)	291 (55.4%)	318 (100%)	

In some studies of NES was found to be related with gender. In a study by Colles et al. (13) and another study by Tholin et al. (14), NES was shown to be associated with gender. In a study conducted with the participation of 1636 university students, it was shown that there were no significant differences between NES and non-NES groups in gender (15). In a study with 83 participants, it was found that there was no relationship between gender and NES (16). In a study by Sevincer et al. (17), a study by Nolan et al. (18) and another study by Adami et al. (19), it was shown that there were no significant differences between NES and non-NES groups in gender. Similarly, in our study, no relationship was found between NES and gender.

In a study conducted with the participation of 2508 adults in Germany, it has shown that there was no

relationship between NES and marital status or education (6). In another study by Ceru-Björk et al. (20), with the participation of 194 people, it has shown that there was no relationship between NES and marital status or education. Similarly, in our study, no association was found between NES and marital status or education.

In a study conducted with the participation of 413 university students, it was shown that there were no significant differences between smoking status and NES (12). In a study by Nolan et al., in a study by Runfola et al., and in another study by Ceru-Björk et al., no relationship has found between NES and smoking status (15,16,20). Similarly, in our study, no association was found between NES and male smokers. But in contrast to the literature, we found a statistically significant relationship between smoking females and NES in our study ( $p=0.012$ ).

Colles et al. (13) were found a positive correlation between NES and BMI increase of normal weight and obese patients. In the study of Milano et al. (21), it was found that the prevalence of NES increased with weight gain and that approximately half of the patients diagnosed with NES had normal weight before the onset of the disease. In the study of Aronoff et al. (22) comparing obese patients with NES to obese patients without NES, the BMI of those with NES was found

to be significantly higher. In a study by Tholin et al. (6) and in another study by Zwaan et al. (14), it was shown that there were a significant association with BMI and NES. As in other studies in the literature, in our study, we found a significant positive relationship between obesity and NES for both sexes ( $p<0.001$ ,  $r=0.258$ ).

### Conclusion

Night-eating syndrome is a hidden public health problem which is related to cardiovascular system diseases, diabetes mellitus and psychiatric disorders besides obesity. It has been shown that night-eating syndrome is associated with obesity and smoking status. Awareness of NES and the risks that NES cause on weight gain and psychological distress are still little known in general practice. Because of the presence of serious health problems associated with night-eating syndrome, it is very important to determine NES in primary care.

It is necessary to increase studies in primary care including different health professions such as sleep medicine, cardiology, endocrinology, etc. Future work should further define NES features of clinical importance to guide the development of agreed diagnostic criteria, and develop targeted intervention strategies.

### References

1. Stunkard AJ, Grace WJ, Wolff HG. The night-eating syndrome: a pattern of food intake among certain obese patients. *Am J Med* 1955;19(1):78-86.
2. Lundgren JD, Allison KC, O'Reardon JP, Stunkard AJ. A descriptive study of non-obese persons with night eating syndrome and a weight-matched comparison group. *Eat Behav* 2008;9(3):343-51.
3. Orhan FÖ, Tuncel D. Gece yeme bozuklukları. *Psikiyatride Güncel Yaklaşımlar* 2009;1(2):132-54.
4. Vander Wal JS, Maaldo TM, Vercellone AC, Gagne DA. Education, progressive muscle relaxation therapy, and exercise for the treatment of night eating syndrome. A pilot study. *Appetite* 2015;89:136-44. doi: 10.1016/j.appet.2015.01.024.
5. Rand CSW, Macgregor AMC, Stunkard AJ. The night eating syndrome in the general population and among post-operative obesity surgery patients. *Int J Eat Disord* 1997;22(1):65-9.
6. de Zwaan M, Müller A, Allison KC, Braehler E, Hilbert A. Prevalence and correlates of night eating in the German general population. *PLoS ONE* 2014;9(5):e97667.
7. Allison KC, Lundgren JD, O'Reardon JP, Martino NS, Sarwer DR, Wadden TA, et

- al. The Night Eating Questionnaire (NEQ): psychometric properties of a measure of severity of the Night Eating Syndrome. *Eat Behav* 2008;9(1):62-72.
8. Atasoy N, Saraçlı Ö, Konuk N, Ankaralı H, Güriz SO, Akdemir A, et al. The reliability and validity of Turkish version of The Night Eating Questionnaire in psychiatric outpatient population. *Anadolu Psikiyatri Derg* 2014;15(3):238-47.
  9. Peker M, Oztora S, Ceylan A, Dagdeviren HN. Internal reliability of Turkish Version of Night Eating Questionnaire in general adult population. *Euras J Fam Med* 2016;5(3):109-12.
  10. Zadjali F, Al-Bulushi A, AlHassani F, AlHinai M. Proportion of night eating syndrome in Arab population of Oman. *J Eat Disord* 2015;3:43. doi: 10.1186/s40337-015-0079-6.
  11. Ramanpreet R, Jaspreet K, Damanjit K, Sharda S. Prevalence of night eating syndrome and obesity among urban adult females of Amritsar (Punjab). *Int J Res Dev Health* 2014;2(2):70-4.
  12. Yahia N, Brown C, Potter S, Szymanski H, Smith K, Pringle L, et al. Night eating syndrome and its association with weight status, physical activity, eating habits, smoking status and sleep patterns among college students. *Eating and Weight Disorders* 2017;22(3):421-33.
  13. Colles S, Dixon J, O'Brian P. Night eating syndrome and nocturnal snacking: Association with obesity, binge eating and psychological distress. *International Journal of Obesity* 2007;31(11):1722-30.
  14. Tholin S, Lindroos A, Tynelinus P, Stunkard AJ, Bulik CM, Rasmussen F. Prevalence of night eating in obese and nonobese twins. *International Journal of Obesity* 2009;17(5):1050-1055.
  15. Runfalo CD, Allison KC, Hardy KK, Lock J, Peebles R. Prevalence and clinical significance of night eating syndrome in university students. *Journal of Adolescent Health* 2014;55(1):41-8.
  16. Napolitano MA, Head S, Babyak MA, Blumenthal JA. Binge eating disorder and night eating syndrome: Psychological and behavioral characteristics. *Int J Eat Disord* 2001;30(2):193-203.
  17. Sevincer GM, Ince E, Taymur I, Konuk N. Night eating syndrome frequency in university students: Association with impulsivity, depression and anxiety. *Bulletin of Clinical Psychopharmacology* 2016;26(3):238-47.
  18. Nolan NJ, Geliebter A. Night eating is associated with emotional and external eating in college students. *Eating Behaviors* 2012;13(3):202-6.
  19. Adami GF, Campostano A, Marinari GM, Ravera G, Scopinaro N. Night eating in obesity: a descriptive study. *Nutrition* 2002;18(7-8):587-9.
  20. Ceru-Björk C, Anderson I, Rössner S. Night eating and nocturnal eating-two different or similar syndromes among obese patients? *Int J Obes Relat Metab Disord* 2001;25(3):365-72.
  21. Milano W, De Rosa M, Milano L, Capasso A. Night eating syndrome: an overview. *J Pharm Pharmacol* 2011;64(1):2-10.
  22. Aronoff NJ, Geliebter A, Zammit G. Gender and body mass index as related to the night eating syndrome in obese outpatients. *J Am Diet Assoc* 2001;101(1):102-4.