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An Investigation into Sleep Habits in Obese Children

Obez Çocuklarda Uyku Alışkanlıklarının İncelenmesi

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Abstract

Aim: This study aims to reveal the extent to which sleep habits differ between obese children and healthy children.

Materıal and Method: This comprehensive study involved 236 obese children and adolescents aged 8-17 who were closely monitored in our clinic. Additionally, 114 children and adolescents who visited the child health and diseases outpatient clinic for various reasons participated. All participants underwent a meticulous assessment of their sleep habits, which included 33 detailed questions about bedtimes, sleep behavior, waking up during the night, getting up in the morning, and daytime sleepiness.

Results: No statistically significant difference in age and gender characteristics between the patient and control groups. The sleep duration for obese children was 6.44±1.3 hours, compared to 6.31±1.29 hours in the control group (P=0.426). No statistical difference was observed in the components assessing sleep habits between the patient and control groups. There is no statistical difference between obese girls and boys considering sleep duration, respectively: 6.41±1.41, 6.5±1.07) (P=0.603). In addition, there is no significant difference between obese and healthy girls and boys according to all sleep parameters.

Conclusion: Our findings indicate that there are no significant differences in sleep habits between obese children and healthy children. However, some studies in the literature reported that different parameters, such as age, pubertal status, timing of sleep and eating behaviors, and sleep duration (or restriction), can affect the relationship between sleep and obesity. Therefore, longitudinal and experimental studies with children are needed to determine the nature of the relationships between sleep and obesity in children.

Keywords: Sleep duration, childhood, obesity, adolescent

Öz

Amaç: Bu çalışma, obez çocuklar ile sağlıklı çocuklar arasındaki uyku alışkanlıklarının ne ölçüde farklılık gösterdiğini ortaya koymayı amaçlamaktadır.

Gereç ve Yöntem: Bu çalışmaya kliniğimizde takip edilen 8-17 yaş arası 236 obez çocuk ve ergen ile çeşitli nedenlerle çocuk sağlık ve hastalıkları polikliniğine başvuran 114 çocuk ve ergen katılmıştır. Mevcut çalışmadaki tüm katılımcılar, yüz yüze görüşmelerle çocuklarda uyku alışkanlıklarının değerlendirilmesinden geçirilmiştir. Değerlendirme, yatma saatleri, uyku davranışı, gece uyanma, sabah kalkma ve gündüz uykululuk ile ilgili 33 soruyu içermektedir.

Bulgular: Hasta ve kontrol grupları arasında yaş ve cinsiyet özellikleri açısından istatistiksel olarak anlamlı bir fark bulunmamıştır. Obez çocukların uyku süresi, kontrol grubunda 6,31±1,29 saat iken 6,44±1,3 saat olarak tespit edilmiştir (P=0,426). Hasta ve kontrol grupları arasındaki uyku alışkanlıklarını değerlendiren bileşenlerde istatistiksel bir fark gözlemlenmemiştir. Obez kız ve erkek çocuklar arasında uyku süreleri açısından da istatistiksel bir fark bulunmamaktadır (sırasıyla: 6,41±1,41, 6,5±1,07) (P=0,603). Ayrıca, obez ve sağlıklı kız ve erkek çocuklar arasında tüm uyku parametreleri açısından anlamlı bir fark yoktur.

Sonuç: Bulgularımız, obez çocuklar ile sağlıklı çocuklar arasında uyku alışkanlıkları açısından önemli farklılıklar olmadığını göstermektedir. Ancak literatürde, yaş, ergenlik durumu, uyku ve yeme davranışlarının zamanlaması, uyku süresi (veya kısıtlaması) gibi farklı parametrelerin uyku ile obezite arasındaki ilişkiyi etkileyebileceğini bildiren bazı çalışmalar bulunmaktadır. Bu nedenle, çocuklar arasında uyku ile obezite arasındaki ilişkilerin doğasını belirlemek için uzunlamasına ve deneysel çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Uyku süresi, çocukluk çağı, obezite, ergenler

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INTRODUCTION

Childhood obesity has become an increasingly significant health issue worldwide and in our country, Türkiye, especially in recent years.[1] Obesity is primarily a significant problem and also may be a cause of many health issues. The prevalence of metabolic syndrome, which includes insulin resistance, hypertension, and disturbances in glucose regulation, has increased in children alongside obesity.[2] In addition, it has been observed that obesity is associated with many factors that negatively affect quality of life. Sleep disorders, eating behavior problems, and social withdrawal are some of the significant health issues seen in these patients. Moreover, dyslipidemia, cardiometabolic risk factors, hypertension, and insulin resistance are health problems that can be observed in both childhood and adulthood related to obesity.[3] Many studies have been conducted in the literature regarding the sleep habits of obese children and adolescents.[4,5] Some researchers have identified an independent relationship between obesity and sleep disorders, while some have found such a relationship specifically in obese girls but not in boys. Others have reported no relationship between obesity and sleep, regardless of gender differences.[4] Sleep duration is suggested to be a risk factor for childhood obesity. Short sleep duration is associated with weight gain and increased body mass index values.[5] In this study, we aimed to evaluate the sleep habits of obese patients being monitored in our clinic. A sleep habits questionnaire assessing bedtime, sleep behavior, waking during the night, and morning wakefulness/daytime sleepiness was administered using face-to-face interview techniques across the entire study group.

MATERIAL AND METHOD

This study was conducted at the Pediatric Health and Diseases Department of Gaziosmanpaşa University School of Medicine between September 2014 and January 2015. In the present study, 236 obese children and adolescents monitored in our clinic, along with 150 non-obese patients who presented for various reasons to the pediatric health and diseases outpatient clinic, were included. This study was initiated after obtaining ethical approval from the Gaziosmanpaşa University Ethics Committee (file no: 14-KAEK-056). Surveys were administered to all participants through face-to-face interviews. To maintain consistency, the same researcher administered all surveys and scales. Following the explanation of this study's scope and purpose, written consent was obtained from all participants and their parents. The height and weight of the patients were measured using a digital scale and height meter (Seca Corp., Chino, CA, USA). Based on age and gender, participants with a body mass index above the 95th percentile were classified into the obese group; in contrast, the healthy control group included those below the 85th percentile. Patients with any syndrome, Cushing syndrome, hypothyroidism, or chronic illness that causes obesity were not included in the study. The questionnaire administered to the study group evaluated sleep habits in preschool and school-aged children. The Turkish validity and reliability were established by Fiş et al.[6] The scale included eight subscales that could be categorized as resistance to bedtime (items 1, 3, 4, 5, 6, 8), delayed sleep onset (item 2), sleep duration (items 9, 10, 11), sleep anxiety (items 5, 7, 8, 21), nighttime awakenings (items 16, 24, 25), parasomnias (items 12, 13, 14, 15, 17, 22, 23), sleep-related breathing disturbances (items 18, 19, 20), and daytime sleepiness (items 26, 27, 28, 29, 30, 31, 32, 33). A total of 33 questions were posed to participants, divided into four sections. These questions assessed bedtime, sleep behavior, nighttime awakenings, and morning wakefulness/daytime sleepiness. Parents were asked to consider the sleep habits of their children and answer these questions based on a week prior. If, for any reason, there were circumstances one week ago that differed from their usual routine—such as the child having a feverish infection and experiencing sleep difficulties or disruptions in home life due to moving or renovations—they were instructed to reflect on the last week their child had a regular routine to answer the questions. Respondents were asked to consider how often these situations occurred: if it happened 5-7 times a week, it should be answered as "usually;" if it occurred 2-4 times, "sometimes;" and if it happened once or not at all, "rarely."

Statistical Analysis

A significance test was assessed using the independent sample t-test to compare continuous variables between groups. Pearson correlation analysis was used to determine the relationships. Continuous variables were expressed as mean (M) and standard deviation (SD). P-values calculated to be below 0.05 were considered statistically significant. The calculations were performed using commercial statistical software (IBM SPSS Statistics 19, SPSS Inc., an IBM Company, Somers, NY).)

RESULTS

This study included 136 patients, of which 82 (62.3%) were female and 82 (37.6%) were male; the control group consisted of 66 (57.8%) females and 48 (42.1%) males. The average age of the patients was 11.86±3.03 years, and the BMI of all obese participants was between the 95th and 99th percentiles, while the average age of the control group was 11.38±3.13 years, with no statistically significant difference between the two groups (**Table 1**). The average BMI of the patients was 28.21± 4.91, while the average BMI of the control group was 24.13± 4.5 (P<0.001). There was no significant correlation between BMI and sleep duration in obese children (r = -0.123, P=0.093). Going to bed reluctantly title in this study questioned and there is no significantly difference found between obese and healthy children (P:0,604). Difficulty in falling asleep is evaluated by questionare and found no difference between two groups and genders (P: 0,712). Anxiety of falling asleep is guestiond to two groups and the answers were found similar and we found no statistically difference between two groups (P: 0,768). Breathing problems and daytime somnolence evaluated in two groups and no statistically differences were found, respectively P:0,584 and P:0,236. The sleep duration for

obese children was 6.44±1.3 hours, compared to 6.31±1.29 hours in the control group (P=0.426). When comparing sleep duration between female and male obese children, no significant difference was found 6.41±1.41 hours for females and 6.5±1.07 hours for males (P=0.603) (**Table 2**).

Table1. Comparison of obese children and healthy controls in terms of sleep habits

	Control (n=114)	Patients (n=218)	P
Going to bed reluctantly	10.85±2.30	10.71±2.37	0.604
Difficulty in falling asleep	2.51±0.72	2.48±0.75	0.712
Sleep latency	6.31±1.29	6.44±1.3	0.426
Falling asleep anxiety	6.19±2.32	6.27±2.41	0.768
Night awakenings	4.42±1.35	4.62±1.66	0.297
Nightmares	10.23±3.36	9.87±3.37	0.410
Breathing problems	4.16±1.68	4.29±1.93	0.584
Daytime somnolence	15.72±3.37	15.25±3.24	0.236

Table2. Sleep habits in terms of gender in obese children

	Female N:136	Male N:82	P
Going to bed reluctantly	10.79±2.39	10.55±2.34	0.482
Difficulty in falling asleep	2.42±0.78	2.59±0.71	0.105
Sleep latency	6.41±1.41	6.5±1.07	0.603
Falling asleep anxiety	6.45±2.51	5.97±2.23	0.162
Night awakenings	4.65±1.77	4.58±1.47	0.769
Nightmares	9.91±3.42	9.8±3.3	0.844
Breathing problems	4.09±1.87	4.61±2	0.070
Daytime somnolence	15.44±3.14	14.92±3.4	0.270

DISCUSSION

This study is an important research to evaluate the sleep habits of obese children in our region and to compare them with healthy children. In this study, there is no significant difference between obese and healthy children according to children's sleep habits questionnaire. Childhood obesity is increasingly widespread in Türkiye and worldwide. Although the prevalence of obesity is still lower than in North America and Western Europe, it is increasing in Türkiye, which is parallel to the trend in many countries.[7,8] The increasing prevalence of obesity in children has a considerable impact on the development of many comorbidities that will disrupt sleep comfort, such as obstructive sleep apnea and obesity-related hypoventilation syndrome.[9] The relationship between sleep and obesity is not fully understood.

Members of the American Academy of Sleep Medicine developed consensus recommendations for the amount of sleep needed to promote optimal health in children and adolescents. In these recommendations, Children 6 to 12 years of age should sleep 9 to 12 hours and teenagers 13 to 18 years of age should sleep 8 to 10 hours per 24 hours on a regular basis to promote optimal health.[10] Sleeping for the recommended number of hours regularly is associated with better health outcomes, such as attention, behavior, learning, memory, emotional regulation, quality of life, and mental and physical health.

Chronic short sleep duration was associated with increased adiposity and obesity from infancy to school age.[4] Additionally, researchers have suggested that short sleep duration is a risk factor for the development of obesity and overweight.[5] Pileggi et al.[11] conducted a study from a cross-sectional perspective, considering various factors that affect body weight, and showed that chronic sleep deprivation is associated with a higher BMI in children around the age of 10. In their study, 39% of children were classified as short sleepers, and the mean sleep duration was 9.4 (SD±60.6), and the mean age was 9.9 years. In our study, the mean sleep duration was 6.31(±1.29) in obese children, and the mean age was 11.8 years. The age range in our study affected the result.

Sleep requirements change throughout childhood, so definitions of short sleep duration vary across different age groups. In a pediatric study of 8,274 Japanese children ages 6 to 7, those who slept fewer than eight hours were almost three times more likely to be overweight than those who slept more than 10 hours.[12] Also, previous studies have reported that longer nighttime sleep reduces the risk of developing overweight.[13,14]

While some researchers have stated that obesity development associated with short sleep duration is only seen in boys, and the same is not true for girls, others have suggested that short sleep duration is associated with obesity in both genders.[11,15] In our study, it was observed that there was no difference in sleep duration according to gender. A larger study may be needed to highlight the difference.

In the literature, it has been found that late bedtime in children is predicted as an independent parameter in the relationship between short sleep duration and obesity. It has been suggested that these children consume more calories and spend more time in front of the screen before bedtime and have shorter sleep times due to this late bedtime. However, the researchers who conducted this study emphasized that the number of cases in their study was insufficient.[16,17] In our study, there was no statistically significant difference between the groups in terms of bedtime resistance and delay in falling asleep. Another study indicated that insufficient sleep at age 14 was a predictor of weight gain between the ages of 14 and 18, with the strongest correlations observed among adolescents.[18] It also found a consistent association between short sleep in early childhood (ages 3–7) and concurrent or later obesity.[19] A study conducted on Danish children aged 8-11 found that varying sleep schedules over a specific week were associated with increased energy intake, independent of total sleep duration, screen time, and demographic confounders.[20] Going to bed reluctantly is evaluated in this study. Especially obese children are mostly using internet more than the others and watching television up to late hours. Internet addiction is related to poor sleep quality.[21] In this study we did not evaluate the internet addiction but we found no difference between obese and healthy children considering with going tobe reluctantly title. Eliacık et al.[21] investigated the sleep habits in obese children

and found that there is no significant difference between obese and healthy children, considering sleep disturbances and daytime dysfunction. On the other hand, obese children may have some breathing problems. In this questionnaire, participants were asked about breathing problems. Data showed that there was no difference between obese and healthy volunteers. Yang et al. described some breathing problems in obese children, as many studies investigated sleep disorders in obese children.[22] Our results were not compatible with the literature. In many studies, investigators use polysomnography to detect breathing problems. However, this study is based on observation.

Limitations

Consistent with most similar studies in the literature,[11,23] in our study, sleep duration was obtained from parents' self-reports, and there is no existing resource to verify or validate this information. However, parent reports of sleep behaviors have been found in the literature to have significant validity and reliability when compared with objective actigraphic measures.[24] The wide age range of our study group constituted another limitation. The definition of the sleep requirement during childhood varies by age, so the criteria for short sleep duration also differ across various age groups. Another limitation of the study is that physical examination findings environmental or personal factors and laboratory results that may affect sleep duration could not be evaluated statistically.

CONCLUSION

In this study we evaluate sleep habits of obese children and we compare them to healthy children. We found no differeence between two group. Therefore, longitudinal and experimental studies with children are needed to determine the nature of the relationships between sleep and obesity in children.

ETHICAL DECLARATIONS

Ethics Committee Approval: This study was initiated after obtaining ethical approval from the Gaziosmanpaşa University Ethics Committee (Decision no: 14-KAEK-056).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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