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OKAN UNIVERSITY

**FACULTY OF HEALTH SCIENCES
DEPARTMENT OF NUTRITION AND DIETETICS**

**DETERMINING THE RELATIONSHIP BETWEEN CIRCADIAN
RHYTHM,OBESITY AND SLEEP PATTERNS AMONG UNIVERSITY
STUDENTS IN ISTANBUL**

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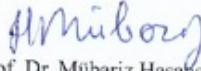
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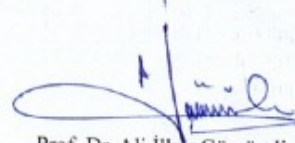
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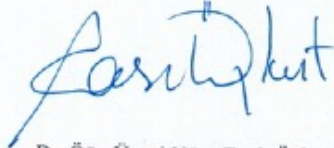
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DECLARATION

We hereby declare that this undergraduate dissertation is our own work. It contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgments has been made in the text.

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LIST OF SYMBOLS AND ABBREVIATIONS

BF: Body Fat

BMI: Body Mass Index

Cm: Cantimeter

EEG: Electroencephalography

Kg: Kilogram

NES: Night Eating Syndrome

NREM: Non- Rapid Eye Movement

REM: Rapid Eye Movement

SCN : Suprachiasmatic Nucleus

SQS-SVQ: Sleep Quality Scale and Sleep Variables Questionnaire

TFEQ : Three Factor Eating Questionnaire

TURDEP: Türkiye Diyabet, Obezite ve Hipertansiyon Epidemiyolojisi Çalışması

WHO: World Health Organization

ABSTRACT

Okur M. , Başaran İ. (2021), Determination of the Relationship Between Circadian Rhythm and Obesity and Sleep Pattern in University Students. Okan University Health Sciences Institute, Nutrition and Dietetics Undergraduate Thesis. Istanbul.

The study, which was planned to examine the relationship between circadian rhythm, sleep quality and obesity in university students, was conducted with 390 students in Istanbul. The data were collected by applying the questionnaire form prepared by the researchers in line with the relevant literature using the online questionnaire technique. Students were asked questions to determine their general characteristics, eating habits and sleep quality. Spss statistics program was used to evaluate the data.

As a result of the research; It was determined that 15.1% of a total of 392 students were underweight, 61.2% were normal, 18.1% were overweight, 3.1% were obese and 0.8% were morbidly obese. It was determined that students got an average of 13.84 ± 2.9 points from the sleep quality scale. There was no statistically significant correlation between BMI value and Sleep Quality Scale total score ($p > .05$; $r = .19$). It was observed that 60.2% of the students consumed the main meal twice a day, 55.4% skipped the main meal and the most skipped main meal was lunch. 3.3% of the participants did not specify which meal they skip the most. The most common reason for students to skip main meals was determined to be their lack of habits with 44.1%. 27.6% of the participants do not snack, and when they get hungry at night, the most preferred food is junk food / fast food with a ratio of 41%. As a result of the statistical researches, no significant relationship was found between TFEQ Factor 1 and sleep duration. A positive correlation was found between TFEQ Factor 2, TFEQ Factor 3 and TFEQ Factor 4 and sleep duration.

New strategies should be designed to encourage individuals to eat diets in line with the circadian rhythm and to establish sleep patterns. By providing trainings on the subject, it is aimed to provide individuals with a healthy diet in accordance with the circadian rhythm and to create sleep patterns, thus raising awareness of obesity and reducing the rate of obesity. These trainings can make significant contributions to individuals and society in reducing the rate of obesity by raising awareness about the problem of obesity, in relation to sleep and obesity, and the creation of sleep patterns.

Keywords: Nutrition, Circadian Rhythm, Sleep Timing, Obesity, Meal Timing

ÖZET

Okur M. , Başaran İ. (2021), Üniversite Öğrencilerinde Sirkadiyen Ritmin Obezite ve Uyku Düzeni İle İlişkisinin Saptanması. Okan Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme Ve Diyetetik Lisans Tezi. İstanbul.

Üniversite öğrencilerinde sirkadiyen ritim, uyku kalitesi ve obezite arasındaki ilişkinin incelenmesi amacıyla planlanan araştırma, İstanbul ilindeki 390 öğrenci ile yürütülmüştür. Veriler, araştırmacılar tarafından ilgili literatür doğrultusunda hazırlanan anket formunun online anket tekniği kullanılarak uygulanması ile toplanmıştır. Öğrencilere genel özellikleri, beslenme alışkanlıkları ve uyku kalite durumlarını belirlemek için sorular sorulmuştur. Verilerin değerlendirilmesinde spss istatistik programı kullanılmıştır.

Araştırmanın sonucunda; Toplam 392 öğrencinin %15,1'i zayıf, %61,2'sinin normal, %18,1'inin fazla kilolu, %3,1'nin obez ve %0,8'inin morbid obez olduğu saptanmıştır. Öğrencilerin uyku kalitesi ölçeğinden ortalama $13,84 \pm 2,9$ puan aldıkları saptanmıştır. BMI değeri ile Uyku Kalitesi Ölçeği toplam puanı arasında istatistiksel olarak anlamlı bir ilişki bulunmamıştır ($p > .05$; $r = .19$). Öğrencilerin %60,2'sinin günde 2 kez ana öğün tükettikleri, %55,4'ünün ana öğün atladığı ve en çok atlanan ana öğünün ise öğle yemeği olduğu görülmüştür. Katılımcıların %3,3'ü ise en çok hangi öğünü atladığını belirtmemiştir. Öğrencilerin en çok ana öğün atlama sebebi ise %44,1 ile alışkanlıklarının olmaması olarak tespit edilmiştir. Katılımcıların %27,6'sı ara öğün yapmamakta, Gece acıktıklarında ise en çok tercih ettikleri besinin %41 oranı ile abur-cubur/fastfood olduğu görülmüştür. Yapılan istatistiksel araştırmalar sonucunda TFEQ Faktör 1 ile uyku süresi arasında anlamlı bir ilişki bulunamamıştır. TFEQ Faktör 2 , TFEQ Faktör 3 ve TFEQ Faktör 4 ile uyku süresi arasında pozitif yönlü bir ilişki saptanmıştır.

Bireyleri sirkadiyen ritme uygun beslenmelerine ve uyku düzenlerini oluşturmalarına teşvik etmek için yeni stratejiler tasarlanmalıdır. Konuyla ilgili eğitimler vererek bireylerin hem sirkadiyen ritme uygun olarak sağlıklı beslenmelerini sağlamak hem de uyku düzenlerini oluşturmak ve bu sayede obeziteye farkındalık yaratmak ve obezite oranını düşürebilmek hedeflenmiştir. Bu eğitimler ne zaman nasıl beslenilmesi gerektiği konusunda, uykunun obezite

ile ilişkilendirilmesi ve uyku düzenlerinin oluşturulması konusunda, obezite problemine farkındalık yaratarak obezite oranının düşürülmesinde bireylere ve topluma önemli katkılar sağlayabilir.

Anahtar Kelimeler: Sirkadiyen Ritim, Uyku Zamanlaması, Obezite

1. INTRODUCTION AND PURPOSE

The state of adaptation to day and night is called circadian rhythm. The word circadian is a combination of two Latin words "circa" meaning about and "dies" day (1). The circadian rhythm is autonomously controlled by the cellular circadian clock. Most circadian rhythms are persistently maintained even if there is no external time cue. Disruption of clock function may cause a change in the circadian period (2).

Circadian systems are in a hierarchy and controlled by two structures, central and peripheral (3). In the brain, the upper chiasmatic nuclei (SCN) produce a central circadian rhythm that can control behavioral rhythms, including the sleep / wake cycle and diet (2). For the central timer suprachiasmatic nucleus (SCN) located in the hypothalamus, the light is the most important timer. In addition to light, melatonin, temperature, jet lag and shifts are among the factors affecting the rhythm. Peripheral timers in many peripheral tissues including liver, pancreas and skeletal muscle are managed by signals from the SCN (3). Peripheral circadian rhythms are found in most major organs, and the retina controls the visual process, blood sugar levels, blood pressure, and heart rate (2). However, co-feeding with SCN is also a potential timer for peripheral tissues. Circadian disruption that develops as a result of energy intake in the "wrong" circadian time may cause an increase in body weight, and this supports the fact that feeding time is an important factor contributing to the metabolic disruption seen with circadian disruption (3).

In this context, individuals should be informed about the need to live in accordance with the circadian rhythm in order to live healthy and prevent obesity. Hunger is a biological drive associated with wakefulness.

The relationship between hunger and sleep is regulated by the control of homeostatic and circadian rhythms (4). The shortening or disruption of the sleep time affects the circadian rhythm

(5). It has been shown in studies that obesity, a major health problem, is linked to night-time eating habits and sleep-related eating disorders.

Therefore, it is thought that observing the eating characteristics of obese patients in terms of sleep-wake cycles may provide valuable clues in terms of shedding light on the etiology and treatment of weight gain (4). This study was planned to determine the relationship between circadian rhythm and obesity and sleep patterns in university students.

2.LITERATURE REVIEW

2.1 OBESITY

In general obesity is defined as excessive accumulation or abnormal distribution of body fat (BF) that affects health (6). Although its etiology has not been clearly elucidated, genetic and environmental factors play a major role in obesity (7).

A number of methods are used to identify obesity in people. Obesity may be detected using a variety of approaches. Body mass index (BMI) is a useful indicator for identifying this condition [$BMI = \text{Weight (kg)} / \text{height}^2 \text{ (m}^2\text{)}$]. The waist circumference and waist-to-hip ratio are two measurements used to determine how fat is distributed across the body (8).

Classification	BMI (kg/m ²)	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight (preobese)	25.0–29.9	Mildly increased
Obese	≥30.0	
Class 1	30.0–34.9	Moderate
Class II	35.0–39.9	Severe
Class III	≥40.0	Very severe

Figure1. WHO body mass index (BMI) Classification

According to Who, obesity is considered to be overweight with a body mass index (BMI) above 25, and obese if it is above 30 (9).

2.1.1 THE PREVELANCE OF OBESITY

The global prevalence of obesity is estimated to be 8.2%, which is 5.8% greater than the global prevalence of underweight (those with a BMI of 17) (9).

Obesity was found to be more prevalent in Mediterranean nations and eastern Europe than in the north and west, according to European studies. This rise is notably noticeable among women. The prevalence of obesity in males and females was 10% and 15% in the north, 13% and 16% in the west, 16% and 30% in the Mediterranean coasts, and 18% and 30% in the east, respectively. (10).

The prevalence of obesity in Turkey is as high as in developed western countries, especially in women, it has reached a very high rate of 30%. When the results of the TURDEP study, in which 24.788 people were screened, were evaluated, it was determined that the prevalence of obesity was 30% in women, 13% in men and 22.3% in general. Looking across the country, obesity was less common in the eastern regions (11).

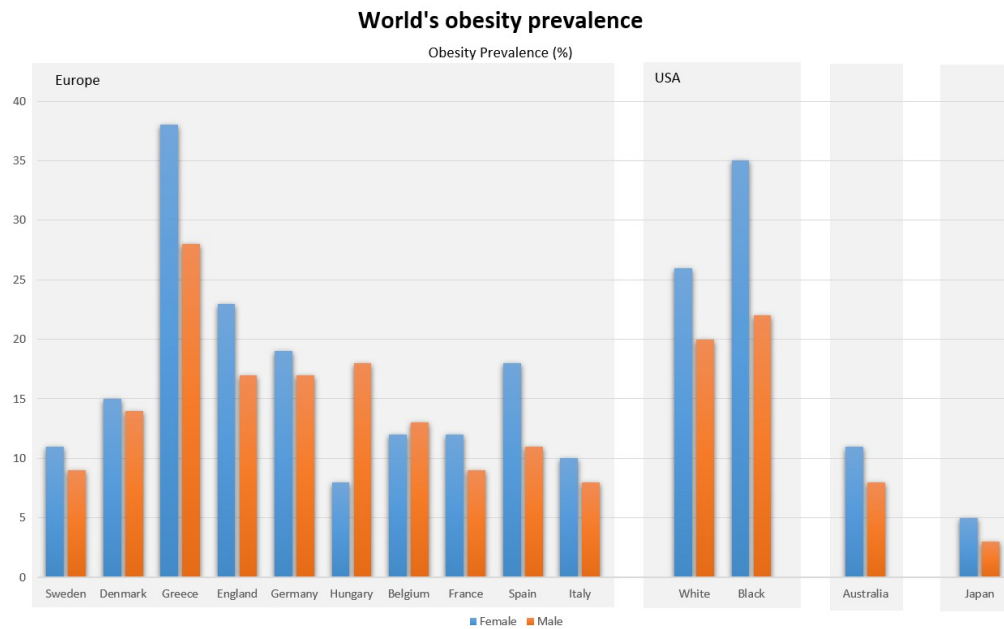


Figure 2. Global obesity rates (%) (52)

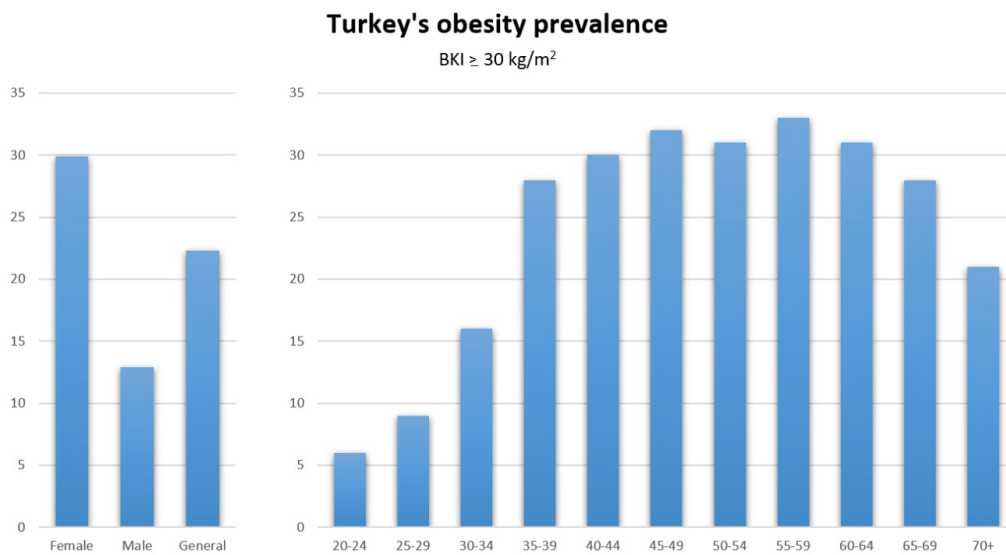


Figure 3. Turkey's obesity Prevalence (11)

Obesity is seen in every age range because of the fact that carbohydrates and fats are predominant in dietary habits along with modern living conditions, and children are away from physical activity and turn to computer games and watching television (12).

2.1.2 THE RELATIONSHIP BETWEEN OBESITY AND NUTRITION

In recent years, there have been various attempts to establish a link between obesity and eating disorders with the goal of treating both (13).

The whole world believes that diet is not simply a function of determining energy needs by satisfying hunger. But; Now, overeating has become a sign of unhealthy eating habits, this eating habit is eating more fatty and sugary foods (14). This situation causes nutritional health problems, especially obesity (8).

In diet therapy, the nutrition program should be customized for the individual. A healthy eating habit should be given to the individual and it should be aimed to maintain a healthy eating habit. (15).

2.2 SLEEP

The reversible state in which the organism's response threshold to external stimuli increases is called sleep. (16). Sleep is a basic requirement similar to the need to eat. In order to have a long and healthy life, individuals need to sleep enough and establish a quality sleep pattern (17). Sleep structure is not homogeneous. (16)

Electroencephalography (EEG) applied studies conducted by Berger in 1929 took an important place in the research of sleep. Studies on EEG recordings during sleep were conducted by Loomis et al. In 1937. As a result of these studies, they determined that there are five periods of sleep, but they could not define the fifth period as the REM process (paradoxical sleep = desynchronized uku) accompanied by rapid eye movements (Rapid Eye Movement) (18).

2.2.1 NREM SLEEP PERIOD

Stages 1, 2, 3 and 4 of sleep are called NREM stages. The 1st and 2nd periods are superficial sleep, and the 1st period makes up 1-5% of all sleep and the 2nd period makes up 40-50%. While low-amplitude high-frequency EEG activity is observed in the first period, sleep spindles appear on the EEG in the second period. In the third period, low frequency high amplitude waves are present and make up 3-8% of all night sleep. In the 4th period, the peak deceleration period accompanied by high voltage wide EEG waves is the period of 10-15% of the whole night sleep (19, 20, 21, 23). NREM sleep accounts for half of the sleep, and the functions of the 1st and 2nd periods are still not fully found. The 3rd and 4th periods of NREM sleep provide physical rest. It is difficult to awaken the person during this period because this period is the period of deep sleep. Somatotropin (growth hormone) is secreted in children during the 3rd-4th period of NREM sleep. In adults, it is thought to play a major role in cell regeneration and repair. (19, 24, 25, 26).

2.2.2 REM SLEEP PERIOD

The sleep that occurs after the 4th period of NREM sleep, where EEG activity is fast and often accompanied by dreaming is REM sleep. REM sleep begins 90 minutes after the first fall asleep, and this time into sleep is called REM latency (19, 25).

Rem sleep allows the brain to mature in the early stages of life, this is one of the important features of REM sleep. In humans and mammals, it is common in the neonatal period when REM sleep is most effective (28). The periods of REM and NREM alternate throughout

sleep, and this relationship is called a 'reciprocal' relationship. This is the case where one's effect decreases while the other increases and dominates sleep (29).

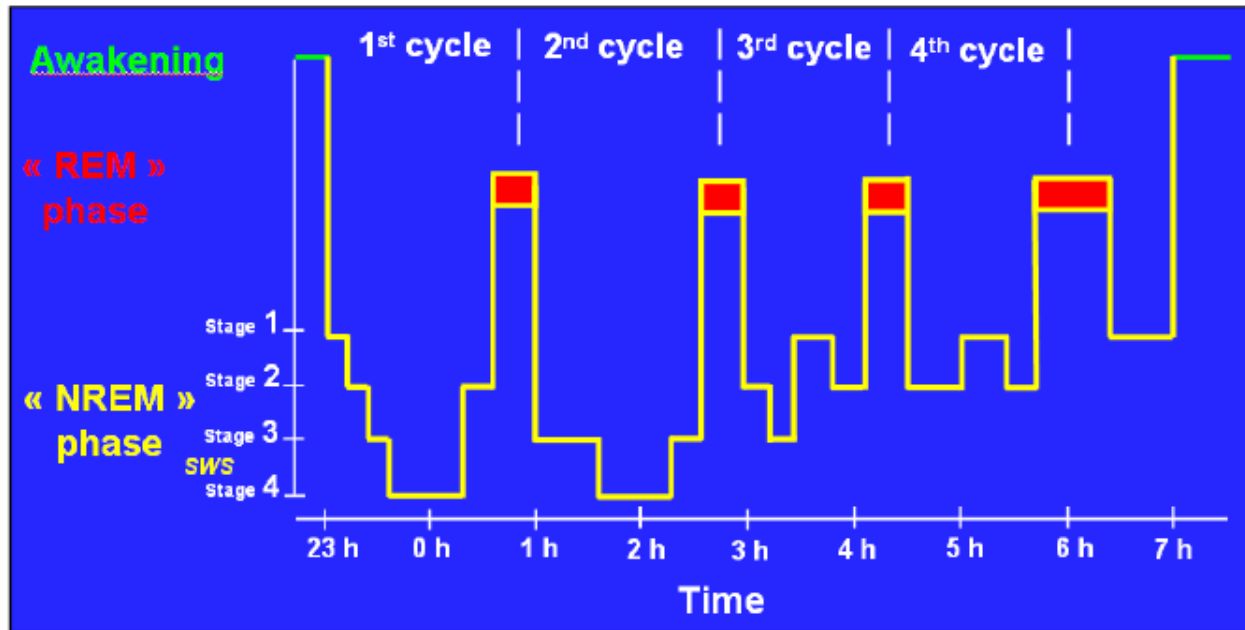


Figure 4. Stages of sleep.

2.2.3 RELATIONSHIP BETWEEN SLEEP AND OBESITY

Today, it is thought that sleep and obesity are linked (30, 31). It is known that the decrease in sleep time disrupts the neurohormonal balance and therefore causes an increase in weight gain and obesity. It is said in the literature that one of the most important diseases seen as a result of sleep disorders is obesity (32). At the population level, while sleep duration decreased over time (33), obesity was observed to increase (34).

A study was conducted on the relationship between sleep time and eating on weight regulation in humans. In this study, 56% of the participants were normal sleepers and 44% were late sleepers. And as a result of this study, it was revealed that late sleepers consume more calorie foods at dinner and eat fast food late at night. As a result, higher BMI has been associated with shorter sleep times (35).

Another factor affecting the weight loss process is sleep timing. In a study with guinea pigs, it was seen that guinea pigs who were awake when they should be asleep and fed later gained weight compared to guinea pigs fed at normal times, although their food intake was the same (36).

In a few studies related with the subject shows that, that overweight and obesity in childhood are associated with sleep (37). Cappuccio et al. Conducted 19 different study with 30,002 children from 11 different countries. As a result of these studies, they have seen that the risk of obesity in children with short sleep times constantly increases (38).

Studies examining the relationship between children's sleep patterns and their weight mostly focus on sleep times. However, nowadays, it is thought that sleep timing may be more effective in cases of obesity compared to sleep time (39).

2.2.4 Night Eating Syndrome

Night eating syndrome was first described by Stunkard et al. In 1955 as a clinical condition distinguished by morning anorexia, evening hyperphagia, and insomnia, assuming obesity in obese patients resistant to weight loss (40). Generally, there are differences in meal times (41).

The biggest differences between night eating syndrome and bulimia nervosa and binge eating disorder are food consumption times, low food intake, and recurring snacks other than actual blockages. NES is clinically important due to its association with obesity. It is seen more with increasing weight. Approximately half of those diagnosed with weight gain stated that they were at a normal weight before they got the syndrome. Diagnosing NES and effectively treating it plays an important role in the management of the overweight population (42).

Proposed research diagnostic criteria for NES

- A. The daily pattern of eating demonstrates a significantly increased intake in the evening and/or nighttime, as manifested by one or both of the following:
 - 1. At least 25% of food intake is consumed after the evening meal
 - 2. At least two episodes of nocturnal eating per week
- B. Awareness and recall of evening and nocturnal eating episodes are present.
- C. The clinical picture is characterized by at least three of the following features:
 - 1. Lack of desire to eat in the morning and/or breakfast is omitted on four or more mornings per week
 - 2. Presence of a strong urge to eat between dinner and sleep onset and/or during the night
 - 3. Sleep onset and/or sleep maintenance insomnia are present four or more nights per week
 - 4. Presence of a belief that one must eat in order to initiate or return to sleep
 - 5. Mood is frequently depressed and/or mood worsens in the evening
- D. The disorder is associated with significant distress and/or impairment in functioning.
- E. The disordered pattern of eating has been maintained for at least 3 months.
- F. The disorder is not secondary to substance abuse or dependence, medical disorder, medication, or another psychiatric disorder.

Figure 3. Diagnostic criterias for NES (55)

Adrian m. et al. conducted a study in 2014. In this study, the relationships between BMI and night eating disorders were investigated in a representative sample of German adults. As a result of this study, when examining the relationship between night eating and obesity, it was observed that age is an important factor and that age and BMI are related (43).

2.3 CIRCADIAN RHYTHM

Circadian rhythm is defined as the 24-hour repetition of biochemical, physiological and behavioral rhythms formed by the rotation of the earth around its own axis (44). The word circadian is a combination of two Latin words "circa" meaning about and "dies" day (1).

Earth's rotation around its axis provides a 24-hour cycle of day and night. Over time, organisms on earth learned these cycles and improved their predictive abilities, gaining the ability to determine their activity times of day or night (45).

The main purpose of the circadian rhythm is to make it easier to adapt to environmental factors and to improve their ability to predict about finding food (46).

An adult should sleep an average of 8 hours a day. This shows that the person will stay awake for 16 hours. While some mammals show nocturnal life, the human being is a diurnal mammal that lives during the day (47).

People spend time doing most activities such as working, eating, physical activity during the day and resting at night. The circadian clock in humans harmonizes between metabolic reactions and planned activities. However, today, with the changing living conditions, deterioration in the circadian rhythms of individuals has begun to be seen. Shift working hours, night work situations, sleep disturbances and night eating syndrome (NES) may play a major role in the disruption of this circadian clock. The harmony between the circadian rhythm and metabolic rhythm affects the energy balance and increases the risk of diseases such as obesity, diabetes, and cardiovascular diseases (48).

Light, melatonin, jet-lag, temperature, and shifts affect the circadian rhythm. Among these factors, the most important factor is light as it directly affects SCN. The secretion of melatonin, known as the sleep hormone, increases at night (02.00-03.00) and then decreases with the increase of daylight in the morning and ends between 07.00-09.00. While temperature is a strong stimulus for most organisms, changes in external temperature are a weak stimulus for mammals. Environmental oscillators, including fibroblasts, liver, kidneys, and lungs, are easily affected by temperature changes. Jet-lag is a syndrome caused by impaired body clock (49, 50). The mismatch between the internal clock after the journey and the light and dark cycle at the destination can cause some problems. After the individual changes the country, their biological clock may change in their sleep pattern and eating state due to the geographical time of the country they travel, day and night difference. People experiencing jet-lag change their habituation status depending on the individual's biological time and the new time zone, which depends on the number of time zones they travel. The more time zones you cross during your journey, the more difficult it will be to reset the clock. Therefore, in order to minimize the jet-lag effect and avoid negative situations, the meals at the destination should be in accordance with the

time period of the location. Finally, situations such as working at night, staying on watch, job changes, in short, the working system in shifts significantly affect the circadian rhythm.

Because the functioning of the rhythm is disrupted and the amount of sleep decreases, resulting in higher BMI values than many studies (49).

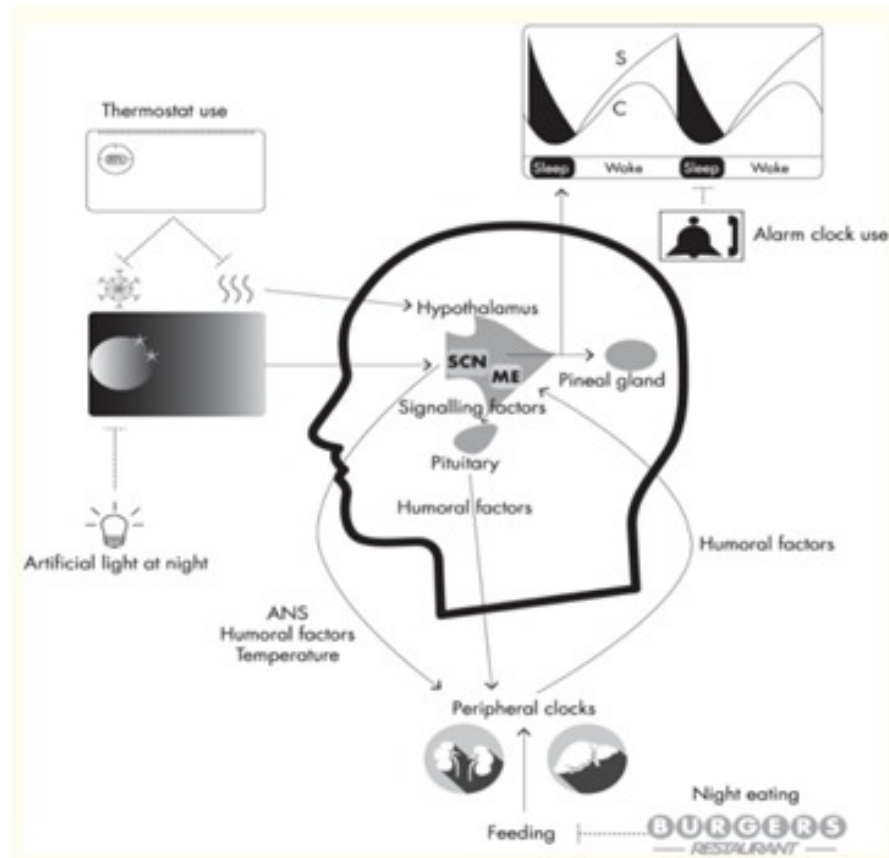


Figure 4. Temporal control of physiology.

Temporarily check physiology. Light exposure is the main time signal of the central clock of the upper chiasmatic nucleus (SCN) of the hypothalamus and inhibits pineal melatonin synthesis. Exposure to artificial light at night can disrupt the SCN clock and melatonin rhythm. It has hypnotic effects in humans, but a recent prospective study on pinealectomy found that endogenous melatonin may not have a strong regulatory effect on sleep (51). The sleep / wake

cycle in which the circadian process (C) affects wakefulness and promotes sleep accumulation during wakefulness (51). The SCN in the hypothalamus is the center that regulates body temperature and affects the circadian rhythm of body temperature. This is the key synchronizer of clocks in environmental organizations (51).

3. MATERIALS AND METHODS

3.1 Data acquisition method

The random sampling method, questionnaire form (Appendix-1), consent form (Appendix-4), which are among the improbable sampling methods, the relevant literature was examined in order to structure the research and achieve the determined objectives before the development of the data collection tool (6- 8). The main frame of the survey was determined with the help of the data obtained from the literature review.

The questionnaire form, which will be used as a data collection tool in this study, was applied online to university students. In the completed questionnaires, the body mass index (BMI) of the university students was calculated in kg / m^2 from the $\text{kg} / \text{height}^2$ formula by referring to the statements of the participants. University students, A questionnaire forum consisting of 59 questions and 5 main sections prepared by the researchers using the literature and similar studies was applied (Appendix-1).

While preparing the questionnaire questions, the '3-factor nutrition questionnaire', which is a new method in the investigation of obesity-related eating habits, the sleep quality scale and the sleep variables questionnaire were used. The questionnaire known as TFEQ "Three factor eating questionnaire" in the literature measures the nutritional habits of individuals. In this study, the questionnaire, which was translated into Turkish by Deniz Kraç, Elif Çiğdem Kapsar, Tuba Avcılar, Özgür Kasımay Çakır, Korkut Ulucan, Hızır Kurtel, Oğuzhan Deyneli, Ahmet İlter Güney, with the name of "Three Factor Nutrition Questionnaire" is proven and used in our country. Researchers found another factor after factor 3. While the first factor measures the level of uncontrolled eating, the second factor measures the degree of emotional eating, the third factor measures the

degree of consciously restricting eating, and the fourth factor measures the sensitivity to hunger. Participants can score a maximum of 72 and a minimum of 18 points in the test. (8). SQS-SVQ consists of a total of 15 questions. participants can get a minimum of 7 points and a maximum of 21 points as a result of this scale. It can be said that as the scores obtained as a result of this scale increase, the quality of the sleep they sleep also increases. Validity and reliability studies were conducted for the Sleep Quality Scale and the Sleep Variables Scale (SQS-SVQ). Necessary permissions have been obtained to use these scales.

The first part consists of 11 questions and the socio-demographic characteristics of the participants were questioned. The second part includes the nutrition questionnaire consisting of 18 questions and the table of the frequency of food consumption, and the sleep quality scale consisting of 15 questions in the third part. In the fourth section, the consumption frequencies of main and snack meals were questioned with 7 questions. Finally, in the fifth chapter, the state of night eating was determined with 7 questions.

3.2 Statistical analysis methods to be used

The data were evaluated with the SPSS 21.0 program on the computer. When comparing two or more independent groups in categorical variables, the Chi-square test was used, and it was determined whether numerical variables showed normal distribution with the One-Sample Kolmogorov-Smirnov test.

One Way ANOVA was used for those with normal distribution in two independent groups, non-parametric Mann Whitney-U test for those who did not show normal distribution in two independent groups, and non-parametric Kuruskal Wallis test for those who did not show normal distribution in more than two independent groups.

Pearson's Correlation Coefficient was used in the correlation analysis of continuous variables with normal distribution, and Spearman Correlation analysis was used in the correlation analysis of continuous variables that did not show normal distribution. Results were evaluated at 95% confidence interval and $p < 0.05$ significance level.

4.RESULTS

4.1. General data

Table 1. Sociodemographic characteristics of the participants			
		n	%
Department at school			
	Nutrition and Dietetics	61	15.6
	Department related to health	68	17.3
	A non-health department	263	67.1
Grade			
	1. Grade	183	46.7
	2. Grade	118	30.1
	3. Grade	34	8.7
	4. Grade	57	14.5
Gender			
	Female	270	68.9
	Male	122	31.1
Working status			

	Working	74	18.9
	Not working	318	81.1
Place of stay			
	With family	337	86.0
	With friends	18	4.6
	Dorm	25	6.4
	Alone	12	3.1
Cigarette			
	Smoker	154	39.3
	Non smoker	238	60.7
Alcohol			
	Drinker	173	44.1
	Non drinker	219	55.9

The average age of the students participating in the study was 20.56 ± 2.02 , 68.9% were women and 67.1% were studying in a non-health department. 46.7% were first year students, 81.1% were not working, 86% lived with their families. 60% of them did not smoke and 55.9% did not drink alcohol (Table 1).

Table 2. Anthropometric characteristics of the participants		
	Mean	Standart deviation
Height (cm)	169.34	8.51
Weight (Kg)	64.71	14.41
BMI (Kg/m ²)	22.40	3.85

The participants' average height is 169.34, their body weight average is 64.71, and their BMI average is 22.40. (Table 2).

Table 3. Meal habits of the participants			
		n	%
Number of main meals			
	1	38	9.7
	2	236	60.2
	3 and more	118	30.1
Skipping main meals			
	Yes	217	55.4
	No	175	44.6
Most skipped meal			
	Breakfast	125	31.9
	Lunch	228	58.2
	Dinner	26	6.6
	Not Specified	13	3.3
Reason of skipping meal			
	Lack of habit	173	44.1
	Lack of time	88	22.4
	Lack of appetite	67	17.1
	Desire to lose weight	13	3.3
	Forgetfulness	51	13
Snack			
	Yes	284	72.4
	No	108	27.6
Number of snack			

0	89	22.7
1	129	32.9
2	125	31.9
3	39	9.9
4	10	2.6

30.1% of the participants consume 3 or more main meals a day. With a rate of 55.4%, 217 students skip the main meal at least once a day (Table 3.).

The most skipped main meal is lunch with 58.2%. 44.1% stated that they did not have a habit, 22.4% did not have time, 17.1% had no appetite, 13% had forgotten and 3.3% had a desire to lose weight. 72.4% of snacks while 27.6% do not snack. While 32.9% of them consume 1 snack per day, 2.6% of them consume snacks 4 times a day. (Table 3.)

Table 4. Weekly consumption of some foods by the participants						
	n(%)					
	Never	1 time	1-2 times	3-4 times	5-6 times	7 time and more
Fruit	61 (15.5)	12(3.1)	89(22.7)	105(26.8)	75(19.1)	50(12.8)
Vegetable	4(1)	14(3.6)	80(20.4)	136(34.7)	104(26.5)	54(13.8)
Gram	10(2.6)	18(4.6)	137(34.9)	143(36.5)	63(16.1)	21(5.4)
Nuts	9(2.3)	30(7.7)	128(32.7)	115(29.3)	77(19.6)	33(8.4)
Junk food	13(3.3)	27(6.9)	115(29.3)	94(24.0)	77(19.6)	66(16.8)
Meat product	11(2.8)	17(4.3)	58(14.8)	124(31.6)	123(31.4)	59(15.1)
Milk product	7(1.8)	6(1.5)	52(13.3)	73(18.6)	126(32.1)	128(32.7)

While 15.5% of the participants do not consume any fruit, 12.8% of them consume fruit 7 or more times a week. With 26.5%, the highest consumption of vegetables is 5-6 times a week. While 2.6% of the participants do not consume any grains during the week, 36.5% consume them 3-4 times a week. Likewise, the highest number of nuts is consumption 3-4 times a week with 29.3%. Looking at the consumption of junk food, 3.3% do not consume it at all

in a week, but 16.8% consume 7 or more times a week. While 31.6% of the participants consume meat and meat products 3-4 times a week, 2.8% do not consume it at all. Looking at milk and dairy products, 1.8% of the participants do not consume any milk and dairy products during the week (Table 4).

Table 5. Night eating habits of the participants			
		n	%
Night eating habit			
	Never	44	11.2
	Rarely	99	25.3
	Sometimes	161	41.1
	Often	88	22.4
What time do you usually eat for the last time?			
	17	31	7,9
	21	205	52.3
	23+	156	39.8
What food group do you prefer when you get hungry at night?			
	Fruit	72	18.4
	Milk products	55	14.0
	Meat Products	21	5.4
	Vegetables	18	4.6
	Nuts	64	16.3
	Junk food	162	41.3
Do you regret the food you ate at night?			
	Often	101	25.8

	Sometimes	107	27.3
	Rarely	80	20.4
	Never	104	26.5
Do you think the food you eat at night is affecting your health badly?			
	Yes	287	73.2
	No	105	26.8
Do you think you will gain more weight when you eat at night?			
	Yes	282	71.9
	No	110	28.1

11.2% of the participants do not have night eating habits and 22.4% eat frequently at night. 7.9% of the participants last ate at 17.00, 52.3% at 21.00 and 39.8% last at 23.00 or later. With a rate of 41.3%, when they get hungry at night, their most preferred food group is junk food and fast food. While 25.8% of the participants regret the meal they ate at night, 26.5% do not regret the meal they ate at night. 73.2% of the participants think that the food they eat at night affects their health badly. 28.1% of the participants do not think they will gain more weight when they eat at night (Table 5).

Table 6. Comparison of the BMI of the participants according to the meal time at night			
Last meal time	BMI		Test*/p-value
	Mean±Sd	Min-Max	
17:00 (n = 31)	23.66 ± 3.72	14.53 -32.79	19,55/.000
21:00 (n=205)	22.89 ± 3.81	16.18-43.94	
23:00 sonrası (n=156)	21.52 ± 3.78	15.82-35.80	
*Kruskall-wallis test			

A statistically significant difference was found between the BMI values according to the last eating time. ($p < .001$) (Table 6).

There was a decrease in the BMI averages of those who ate at 21:00, compared to the participants who ate at 17 most recently. (Table 6).

There was no statistically significant relationship between BMI value and total score of Sleep Quality Scale. ($p > .05$; $r = .19$).

Table 7. Distribution of the scores of the participants from the Sleep Quality Scale and Nutrition Scale		
Scales	Mean \pm Ss	Min-Max
Sleep Quality Scale	13,84 \pm 2,9	7,00-21,00
TFEQ Factor 1	11,10 \pm 2,7	5,00-20,00
TFEQ Factor 2	6,85 \pm 2,9	3,00-12,00
TFEQ Factor 3	14,17 \pm 3,6	6,00-22,00
TFEQ Factor 4	8,63 \pm 2,9	4,00-16,00

As a result of the statistics, the participants got an average of 13.84 points from the sleep quality scale (Table 7).

Participants got an average score of 11.10 points from TFEQ factor 1 and an average score of 6.85 points from factor 2 (Table 7).

The average score obtained from factor 3 was calculated as 14.7, and the average score from factor 4 was calculated as 8.63 (Table 7).

Table 8. BMI percents of the participants					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Thin	59	15,1	15,3	15,3

Valid	Normal	240	61,2	62,3	77,7
	Overweight	71	18,1	18,4	96,1
	Obese	12	3,1	3,1	99,2
	Morbid obese	3	,8	,8	100,0
	Total	385	98,2	100,0	
Missing	System	7	1,8		
Total		392	100,0		

When the body mass indexes of the students participating in the study are examined; It was observed that 61.2% of them were normal and 3.9% were obese/morbid obese. 7 people did not specify their height and weight. (Table 8.)

Table 9. The relationship between SQS-SVQ, TFEQ and BMI					
	T F E Q FACTOR 1	T F E Q FACTOR 2	T F E Q FACTOR 3	T F E Q FACTOR 4	BMI
S Q S - S V Q SCORE	r= -0,10 P= 0,04	r=-0,12 P=0.01	r=0,09 P=0,06	r=-0,13 P=0,007	r=0,06 P=0,19

A weak negative correlation was found between factor 1 and sleep quality scale score ($r = -0.10$; $p < 0.05$) (table 9)

A weak negative correlation was found between factor 2 and sleep quality scale score ($r = -0.12$; $p < 0.05$) (table 9)

No correlation was found between factor 3 and sleep quality scale score ($p > 0.06$) (table 9)

A weak negative correlation was found between factor 4 and sleep quality scale score ($r = -0.13$; $p < 0.01$) (table 9)

Table 10. the relationship between BMI and TFEQ				
	TFEQ FACTOR 1	TFEQ FACTOR 2	TFEQ FACTOR 3	TFEQ FACTOR 4
BMI	r=0.001 p=0.9	r=0.14 p=0.005	r=0.18 p=0.0	r=0.14 p=0.005

No statistically significant relationship was found between factor 1 and BMI ($p > 0.05$). A statistically positive and weak correlation was found between factor 2 and BMI ($p < 0.05$). A statistically positive and weak correlation was found between factor 3 and BMI ($p < 0.05$). A weak positive correlation was found between factor 4 and BMI ($p < 0.05$) (table 10).

Table 11. Comparison of the frequency of skipping meals between smokers and non-smokers					
		Skipping meal		Total	χ^2 (pearson chi-square)
		Yes	No		
Cigarette	Yes	96	58	154	$\chi^2 = 5.001$ $p = 0.02$
	Count	62.3%	37.7%	100.0%	
	No	121	117	238	
	Count	50.8%	49.2%	100.0%	
Total		217	175	392	
Count		55.4%	44.6%	100.0%	

The number of skipping meals in smokers was statistically higher than non-smokers. ($p < 0.05$)

5. DISCUSSION

This research was conducted to examine the relationship between sociodemographic characteristics, dietary habits, sleep quality, circadian rhythm and obesity of students studying at universities in Istanbul. Individuals' sleep quality, body mass index and night eating habits were analyzed. Circadian rhythm and sleep patterns are of great importance for human health. Inefficient sleep and disruption of the circadian rhythm can lead to many diseases such as diabetes, blood pressure, depression, heart diseases. 68.9% of the 392 people participating in the

research were female and 31.1% were male. According to the results of the research, while most of the participants (69.7%) do not smoke, 39.3% of them do. In a study by Tuna R et al., a significant relationship was found between smoking and sleep quality (56).

The average BMI of the students participating in this study was found to be 22.40. 15.1% of the participants were underweight, 61.2% were at normal weight, 18.1% were overweight, 3.1% were obese, and 0.8% were morbidly obese. According to the results of the research, most of the participating students have normal weight.

When it comes to eating habits, the first concepts that come to mind are main meals and snacks. Main meals are divided into three as morning, lunch and dinner, and snacks are divided into mid-morning, afternoon and night snacks. Although the consumption of meals varies from person to person, a certain group is fed only with the main meal, while another segment adds snacks to their eating habits. In this study, 55.4% of the participants skip their main meals, while 44.6% do not skip the main meals. It was determined that the most skipped meal was lunch with 58.2% and the reason was the lack of habits with a rate of 44.1%. In another study conducted in the literature, the reason for skipping the main meal was determined as lack of time, in this context, the result of the study did not show a similar result with this study (57). In another similar study, Saygın et al. found that 62.6% of the participants skipped breakfast, 37.4% skipped lunch, and found that the participants who skipped breakfast felt sluggish (58).

Participants were evaluated on a maximum of 21 points and a minimum of 7 points. As a result, the participants got an average of 13.84 points from the sleep quality scale. In a study conducted by Kadriye b., it was found that 43.3% of the participants had good sleep quality and 56.7% had poor sleep quality. and in this study, 46.2% of university students had good sleep quality and 53.8% had poor sleep quality. In a study conducted by the Turkish Sleep Medicine Association in the adult population in 2010, it was seen that 21.8% of the adult individuals of the Turkish society had low sleep quality. In some studies in the literature, it has been stated that there is a significant relationship between sleep quality and BMI. In some studies, no significant relationship was found between sleep quality and BMI (59,60,61). In our study, sleep quality was

not named as good or bad sleep quality because the scoring score of the sleep quality scale was specified as minimum and maximum.

In the research, weekly food consumption questioning of the participants was made. 26.8% of the participants stated that they consumed fruit 3-4 times a week, and 15.5% of the participants stated that they did not consume any fruit during the week. Vegetable consumption with a rate of 34.7% is also consumed 3-4 times a week at most. Looking at the weekly grain consumption, 2.6% of the participants reported that they did not consume any grain group foods. 8.4% of the participants stated that they consume nuts 7 or more times a week. Considering the consumption of junk food, 29.3% of the participants said that they consume junk food 1-2 times a week. 31.6% of the participants consume meat group products 3-4 times a week. Looking at milk consumption, 32%. With 7, the most preferred option by the participants was 7 or more of the week. In this study, the frequency of food consumption was questioned in order to determine the healthy nutritional status of the participants. It can be said that the consumption of junk food is high due to the fact that the participants are students.

The night eating habits of the participants were questioned in order to monitor their adaptation to the circadian rhythm. As a result, 39.8% of the participants stated that they ate after 23:00 at night. And looking at their food preferences, 41.3% of the participants stated that they prefer junk food.

Smoking has become one of the most important factors affecting public health. Considering that smoking will suppress the appetite and cause skipping meals, we statistically analyzed the meal skipping status of smokers and non-smokers. As a result of the research, 62% of smokers skip meals while 50% of non-smokers skip meals.

As a result of the research, it was determined that 39.3% of 392 people were smoking while 60.2% were non-smokers. In another study conducted by Ermiş et al., 24.9% of the 1105 students who participated use cigarettes constantly, 12.8% sometimes, and 62.4% never (57). When we compared this study with our study, a parallelism was observed between cigarette consumption.

As a result of the research, no correlation could be found between the sleep quality scale and BMI values. In some studies, the relationship between sleep quality and BMI was found to be statistically significant (write this sentence). In addition, a statistically significant relationship was found between sleep quality and BMI values in a study conducted by Gizem S (62).

In a study conducted by Kadriye B., the relationship between smoking and sleep quality was examined. As a result of this study; It was determined that 68% of smokers had poor sleep quality, 49.2% of non-smokers had poor sleep quality, and 42.9% of smokers had poor sleep quality. Smokers have higher rates of poor sleep quality than non-smokers and smokers. However, this result was not statistically significant (63).

In a study conducted by Kripke et al., it was said that the ideal daily sleep time is 7 hours (64). As a result of our study, when the relationship between sleep quality and nutritional factors was examined statistically, it was found that as sleep quality improves, eating habits also improve with a weak relationship. In a study conducted by Gökçem G., when the sleep hours of individuals are examined, the average daily sleep duration varies, considering that the participants are employees. However, it has been determined that individuals wake up late in the morning, go to bed late at night, and nutrition affects the sleep duration of individuals (65).

6. CONCLUSION

The main purpose of this study is to determine the relationship between sleep quality, circadian rhythm, eating habits and obesity. Many previous studies have found a significant relationship between circadian rhythm and obesity. Studies on sleep duration, night eating habits, and food consumption related to stress level in the literature were conducted with participants from all age groups. The reason why the population selection in this study is university students

is that the number of studies conducted on university students is low and that students generally go to bed later than working individuals. Many of them have snacking habits while studying at night. It was thought that intense stress and the necessity of completing exam subjects, especially during exam periods, negatively affected sleep and nutrition patterns. Based on this, the BMI values of the people were calculated by questioning their sleep times, weight and height, their frequency of consuming food at night and their preferred food groups, and their status of being obese was investigated. It is thought that there is a relationship between NES, which is called night eating syndrome in the literature, and obesity. In this study, the relationship between food consumed late at night and obesity was investigated, so it was questioned which food group people preferred when they were hungry at night. There was no significant difference between the food they consume at night and being overweight/obese/morbidly obese, since the study group was young and a group and generally showed a normal BMI distribution.

In the literature, it is stated that those who sleep and eat late at night are prone to obesity. Although there are many studies on this subject, no significant difference was found between circadian rhythm, sleep quality and obesity in our study. The inability to find a significant difference may be due to the young population of the study population and the high number of students studying in the field of health among the participants who solved the questionnaire, and related to this, their high level of nutrition knowledge.

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7.APPENDICES

APPENDIX 1 -ÜNİVERSİTE ÖĞRENCİLERİNDE SİRKADİYEN BESLENME, UYKU VE OBEZİTE İLİŞKİSİNİN SAPTANMASI ANKETİ

1-Hangi üniversitede öğrenim görüyorsunuz ?

.....

2-Kaçıncı sınıftasınız ?

· Hazırlık

· 1

· 2

· 3

· 4

· Diğer

3-Hangi bölümü okuyorsunuz?

.....

4-Cinsiyet ?

· Kız

· Erkek

5-Yaşınız?

.....

6-Kilonuz ?(Kg cinsinden yazınız.)

.....

7-Boyunuz? (cm cinsinden yazınız.)

.....

8-Sigara kullanıyor musunuz?

- Evet
- Hayır

9-Alkol kullanıyor musunuz?

- Evet
- Hayır

10-Nerede /Kiminle yaşıyorsunuz ?

- Aile ile birlikte
- Evde arkadaşlarla beraber
- Evde yalnız
- Yurtta
- Diğer

11-Çalışma durumunuz?

- Çalışıyor
- Çalışmıyor

APPENDIX 2- TFEQ

Lütfen kendinize en uygun cevabı işaretleyin.

1) Yeni yemek yemiř olsam bile, piřen gzel bir et kokusu aldıđımda, kendimi yememek iin zor tutuyorum.

- Kesinlikle dođru
- ođunlukla dođru
- ođunlukla yanlış
- Kesinlikle yanlış

2) Kilomu kontrol altında tutmak iin kk porsiyon yemeye alıřırım.

- Kesinlikle dođru
- ođunlukla dođru
- ođunlukla yanlış
- Kesinlikle yanlış

3) Huzursuz ve endiřeli olduđumda, kendimi yemek yerken buluyorum.

- Kesinlikle dođru
- ođunlukla dođru
- ođunlukla yanlış
- Kesinlikle yanlış

4) Bazen yemek yemeye bařladıđımda, duramayacakmıřım gibi geliyor.

- Kesinlikle dođru
- ođunlukla dođru
- ođunlukla yanlış
- Kesinlikle yanlış

5) Yemek yiyen bir kiři ile birlikte olmak, çoğunlukla yemek yiyecek kadar kendimi aç hissetmeme neden oluyor

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

6) Üzgün olduğum zamanlarda, sıklıkla çok fazla yemek yerim.

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

7) Lezzetli olan bir yiyecek gördüğümde, o kadar çok acıkırım ki o an yemem gerekir.

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

8) O kadar çok acıkıyorum ki doymak bilmiyorum.

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

9) Her zaman o kadar açım ki, tabağımdaki yemeği bitirmeden önce yemek yemeyi durdurmam benim için çok zor.

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

10) Yalnızlık hissettiğimde, kendimi yemek yerken buluyorum.

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

11) Öğünlerde kilo almamak için kendimi bilinçli bir şekilde durduruyorum.

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

12) Bazı yiyecekler kilo almama neden olduğu için onları yemem

- Kesinlikle doğru
- Çoğunlukla doğru
- Çoğunlukla yanlış
- Kesinlikle yanlış

13) Her zaman yemek yiyecek kadar açım.

- Kesinlikle doğru
- Çoğunlukla doğru

- oęunlukla yanlış
- Kesinlikle yanlış

14) Ne kadar sıklıkla kendinizi aç hissediyorsunuz?

- Sadece yemek öğünlerinde
- Bazen öğünler arasında
- Sıklıkla öğünler arasında
- Neredeyse her zaman

15) Yemeyi sevdiğiniz yiyecekleri satın almaktan kendinizi ne kadar sıklıkla durdurabiliyorsunuz?

- Neredeyse hiç durduramıyorum
- Nadiren durduruyorum
- oęunlukla durduruyorum
- Hemen hemen her zaman durduruyorum

16) İstedığınızden daha az yemek yemeyi ne kadar ölçüde başarabiliyorsunuz?

- Hiç başaramıyorum
- Bazen başarıyorum
- Arada sırada başarıyorum
- oęunlukla başarıyorum

17) Aç olmadığınız halde, aşırı miktarda yemeye devam eder misiniz?

- Asla
- Ender olarak
- Bazen
- En az haftada bir kere

18) 1'den 8'e kadar olan bir derecelendirme yapıldığında, 1 sayısı yemek yemenizde bir kısıtlama yapılmadığını (istediğiniz zaman istediğiniz yiyeceęi yemek) ve 8'de

tamamiyle yemeğin kısıtlandığını (kesin olarak yemek miktarınızı sınırlamak ve porsiyonunuz bittikten sonra tekrar yememek), kendinize hangi sayıyı vereceğinizi aşağıdaki kutucuklardan size en yakın gelenini işaretleyerek belirtiniz.

1	2	3	4	5	6	7	8
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX-3 SLEEP QUALITY SCALE

A. Lütfen aşağıdaki ilk 7 soruyu okula gittiğiniz günleri göz önünde bulundurarak cevaplandırınız.

1. Işıklar söndürölüp yatağa yattığında, aşağıdakilerden hangisi genelde senin için doğrudur?

- Hemen uyurum
- Bir süre uyanık kalırım
- Uyumam için uzun zaman gereklidir

2. Uyuma sorunu yaşar mısın?

- Asla
- Bazen
- Nerdeyse her gece

3. Bazen geceleri uyanır mısın?

- Asla
- Bazen
- Nerdeyse her gece

4. Eğer geceleri uyanıyorsan, aşağıdakilerden hangisi genelde senin için doğrudur?

- Çoğunlukla farkına varmam
- Kısa bir süre sonra tekrar uyurum

- Tekrar uyumam uzun zaman alır

5. Geceleri iyi uyur musun?

- Hayır
- Bazen
- Evet, daima

6. Sabah kalktığında kendini dinlenmiş hisseder misin?

- Hayır
- Bazen
- Evet, daima

7. Geceleri iyi uyuyamadığın olur mu?

- Hayır
- Bazen
- Evet, daima

B. Lütfen aşağıdaki soruların cevaplarını, olabildiğince doğru bir şekilde saat ve dakika olarak yazınız.

8. Yatmaya ne zaman gideceğine karar vermene ailen izin veriyor mu?

Evet

Hayır

9. Okula gittiğin günlerde saat kaçta kalkarsın?

10. Okula gittiğin günlerde saat kaçta yatarsın?

11. Hafta sonu saat kaçta kalkarsın?

12. Hafta sonu saat kaçta yatarsın?

13. Okula gittiğin günlerde yattığın odanın ışıklarını saat kaçta kapatırsın?

C. Lütfen aşağıdaki soruların cevaplarını dakika olarak yazınız.

14. Odanın ışıklarını kapattıktan sonra uykuya dalman genellikle kaç dakika sürer?
.....dakika

15. Gece boyunca genellikle yatağında kaç dakika uyanık olarak uzanırsın?
.....dakika

Ana ve Ara öğün tüketme durumları

1)Günde kaç kez ana öğün tüketiyorsunuz?

- 1 kez
- 2 kez
- 3 kez

2)Günlük öğünlerinizi atlıyor musunuz?

- Evet
- Hayır

3)Gün içinde en çok atladığınız ana öğün?

- Sabah
- Öğle
- Akşam

4)Ana öğün atlama sebebiniz?

- Alışkanlığı yok
- Zaman bulamıyor
- İştahsızlık
- Kilo vermek için
- Unutuyor

5)Gün içinde ana öğün tüketiyor musunuz?

- Evet
- Hayır

6)Tüketiyorsanız kaç kez?

- 1 kez
- 2 kez
- 3 kez
- 4 ve üzeri

7)Günlük su tüketimi miktarınız ?

.....

Gece yemek durumunun saptanması:

1)Gece yemek yiyor musunuz ?

- Sıklıkla
- Bazen
- Nadiren
- Hiç

2)Genellikle en son saat kaçta bir şey yiyorsunuz?

- En son 17.00
- En son 21.00
- En son 23.00

3)Gece acıktığında tercih ettiğiniz besin grubu?

- Meyve
- Süt ve süt ürünleri
- Et ve et ürünleri
- Sebze yemeği
- Çerez
- Abur-cubur/Fast-food

4)Gece yediğiniz yemekten pişmanlık duyuyor musunuz?

- Sıklıkla
- Bazen
- Nadiren
- Hiç

5)Gece yediğiniz yemeğin sağlığını kötü etkilediğini düşünüyor musunuz ?

- Evet
- Hayır

6)Çok acıksanız dahi gece yemek yemediğiniz durumlar oluyor mu?

- Evet
- Hayır

7)Gece yemek yediğinizde daha fazla kilo alacağınızı düşünüyor musunuz ?

- Evet
- Hayır

Besin Tüketim Sıklıkları

Haftada kaç kez tüketirsin?

SIKLIK	7+	5-6	3-4	2-1	1	Hiç
Meyve						
Sebze						
Tahıl						
Baklagil						
Kuruyemiş						
Abur- cubur						
Et ve et ürünleri						
Süt ve süt ürünleri						

APPENDIX 4- CONCENT FORM

İSTANBUL OKAN ÜNİVERSİTESİ FEN, SOSYAL VE GİRİŞİMSSEL OLMAYAN SAĞLIK BİLİMLERİ ARAŞTIRMALARI ETİK KURULU ONAM FORMU

Sizi Dr. Öğr. Üyesi Aylin Seylam Küşümler danışmanlığında Melis Okur ve İrem Başaran tarafından yürütülen “Üniversite Öğrencilerinde Sirkadiyen Ritmin Obezite ve Uyku Düzeni İle İlişkisinin Saptanması” başlıklı araştırmaya davet ediyoruz. Bu araştırmanın amacı üniversite öğrencilerinde uyku düzeni ve sirkadiyen beslenmeye bağlı olarak obez olma durumlarının saptanmasıdır. Araştırmada sizden tahminen 15 dakika kadar süre ayırmanız istenmektedir. Bu çalışmaya katılmak tamamen **gönüllülük** esasına dayanmaktadır. Çalışmanın amacına ulaşması için sizden beklenen, bütün soruları eksiksiz, kimsenin baskısı veya telkini altında olmadan, size en uygun gelen cevapları içtenlikle vermenizdir . Bu formu okuyup onaylamanız, araştırmaya katılmayı kabul ettiğiniz anlamına gelecektir. Ancak, çalışmaya katılmama veya katıldıktan sonra herhangi bir anda çalışmayı bırakma hakkına da sahiptir. Bu çalışmadan elde edilecek bilgiler tamamen araştırma amacı ile kullanılacak olup kişisel bilgileriniz **gizli tutulacaktır**; ancak verileriniz yayın amacı ile kullanılabilir. Eğer araştırmanın amacı ile ilgili verilen bu bilgiler dışında şimdi veya sonra daha fazla bilgiye ihtiyaç duyarsanız araştırmacılara basaraniremm@gmail.com ve meokur@stu.okan.edu.tr e-posta adresinden ulaşabilirsiniz. Araştırma tamamlandığında size özel sonuçların sizinle paylaşılmasını istiyorsanız lütfen araştırmacıya iletiniz.

Araştırmacının	Katılımcının
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