T.C

YEDITEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCE DEPARTMENT OF

NUTRITION AND DIETETICS

COMPARISON OF BREAKFAST HABITS, SLEEP QUALITY AND WAIST CIRCUMFERENCES OF NUTRITION AND DIETETICS STUDENTS IN A PRIVATE UNIVERSITY IN ISTANBUL

MASTER OF SCIENCE THESIS

Oğuz Alibaşoğlu

ISTANBUL- 2018

T.C

YEDITEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCE DEPARTMENT OF

NUTRITION AND DIETETICS

COMPARISON OF BREAKFAST HABITS, SLEEP QUALITY AND WAIST CIRCUMFERENCES OF NUTRITION AND DIETETICS STUDENTS IN A PRIVATE UNIVERSITY IN ISTANBUL

MASTER OF SCIENCE THESIS

OĞUZ ALİBAŞOĞLU

SUPERVISOR

Assistant Proffessor Binnur Okan Bakır

ISTANBUL- 2018

TEZ ONAYI FORMU

Kurum : Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü

Program : Beslenme ve Diyetetik

Tez Başlığı : Comparison of Breakfast Habits, Sleep Quality and Waist Circumferences of Nutrition and Dietetic Students in a Private University in İstanbul

Tez Sahibi : Oğuz Alibaşoğlu

Sınav Tarihi : 28.09.2018

Bu çalışma jurimiz tarafından kapsam ve kalite yönünden Yüksek Lisans Tezi olarak kabul edilmiştir.

	Unvanı, Adı-Soyadı (Kurumu)	İmza
Jüri Başkanı:	Dr. Öğr. Üyesi Elvan Yılmaz Akyüz-Sağlık Bilimleri Üniversitesi	
Tez danışmanı:	Dr. Öğr. Üyesi Binnur Okan Bakır-Yeditepe Üniversitesi	
Üye:	Dr. Öğr. Üyesi İrem Kaya Cebioğlu-Yeditepe Üniversitesi	

ONAY

Bu tez Yeditepe Üniversitesi Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliğinin ilgili maddeleri uyarınca yukarıdaki jüri tarafından uygun görülmüş ve Enstitü Yönetim Kurulu'nun ..12./10./.2018.. tarih ve .....2018/17-05..... sayılı kararı ile onaylanmıştır.

Prof. Dr. Bayram YILMAZ
Sağlık Bilimleri Enstitüsü Müdürü

DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, 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 acknowledgment has been made in the text.

18/10/18

Oğuz Alibaşoğlu

ACKNOWLEDGEMENTS

I would like to present my special thanks to all who have contributed to my efforts in this study.

Foremost, I would like to express my sincere gratitude to my supervisor Asst. Prof.Binnur Okan Bakır for the continuous support of my Master's study, for her motivation, patience, and knowledge. Her guidance helped me in all the time of research and writing of this thesis. I also would like to thank all my friends and colleagues for every help they have made.

Lastly, I wish to express my appreciation to my family for their support and encouragement during the my thesis.

TABLE OF CONTEST

APPROVAL ii
DECLARATION iii
ACKNOWLEDGEMENTS iv
LIST OF TABLES vii
LIST OF SYMBOLS AND ABBREVATIONS ix
ABSTRACT x
ÖZET xi
1.INTRODUCTION 1
2. GENERAL INFORMATION 2
2.1 Obesity 2
2.1.1 Determination of Obesity 2
2.1.3The Role of Sleep in Etiology of Obesity 6
2.1.4 Obesity and Health Problems 7
2.1.5 Obesity Treatment 8
2.2Meal Frequency and Breakfast Habits 11
2.2.1 Meal Frequency 11
2.2.2 Breakfast Habits 11
2.3 Sleep 12
2.3.1 Circadian Rhythm 14
2.3.2 Sleep Physiology 15
2.3.3 Sleep Quality and Sleep Phases 15
2.3.4 Sleep and Hormones: 17
2.3.5 Effects of Diet on Sleep Quality 18
2.3.6 Sleep Requirements 19
3. MATERIAL AND METHODS 20
3.1 Ethical Approval 20
3.2 Participants 20
3.3 Measures 21
3.4 Pittsburgh Sleep Quality Index 21
3.5 Statistical Analyses 22
4. FINDINGS 22

5.DISCUSSION 40
6.CONCLUSION 43
7. REFERENCES 44
8. APPENDIX 66
8.1 Ethical Approval 66
8.2 Volunteer Form 67
8.3 Questionnaire Form 68
8.4 Pittsburgh Sleep Quality Index 71
9. CURRICULUM VITAE 74

LIST OF TABLES

Table 1. Combined recommendations of body mass index and waist circumference cut-off points made for overweight or obesity, and association with disease risk

Table 2. International Diabetes Federation criteria for ethnic or country-specific values for waist circumference

Table 3. Classification of BMI values

Table 4. Drugs Approved by the Food and Drug Administration for Obesity Treatment

Table 5. Age Features of Participants

Table 5.1. BMI Distribution of Participants

Table 5.2. Body Weight, Height, BMI and Waist Circumferences of The Participants

Table 5.3. Comparison of Mean BMI Scores According to Class

Table 5.4. Comparison of Mean Waist Circumferences According to Class

Table 5.5. Waist Circumference Average of Participants According to WHO's Classification

Table 5.6. Waist circumference means <88 cm and >88 cm waist circumference and standard deviation

Table 5.7. Relationship Between Breakfast Skipping and Waist Circumference

Table 5.8. Frequency and Reasons For Meal Skipping of Participants

Table 5.9. Meal Skipping and Waist Circumference Relationship of Participants

Table 5.10. Most Skipped Meals and Meal Skipping Frequency

Table 5.11. Living Place and Waist Circumference Relationship of Participants

Table 5.12. Sleep Duration and Waist Circumference Relationship of Participants

Table 5.13. Relationship Between Sleep Duration and Breakfast Skipping

Table 5.14. Relationship Between Sleep Quality and Waist Circumference

Table 5.15. Relationship Between Sleep Quality and Breakfast Skipping

Table 5.16. Relationship Between Non-Routine Sleep Frequency and Sleep Irregularities

Table 5.17. Relationship Between Sleep Irregularities and Appetite

Table 5.18. Sleep Irregularities and Food Preferences

Table 5.19. Living Place and Meal Skipping Frequency

Table 5.20. Sleep Quality and Grade

Table 5.21. Sleep Duration and None-Routine Sleep Relationship

LIST OF SYMBOLS AND ABBREVATIONS

ALT: Alanine Aminotransferase

BMI: Body Mass Index

EGFR: Estimated Glomerular Filtration Rate

FDA: Food and Drug Administration

GABA: Gamma-aminobutyric acid

GH: Growth Hormone

HOMA-IR: Homeostatic Model Assessment-Insulin Resistance

KJ:Kılojoule

LDL: Low Density Lipid

NASH: Non-Alcoholic Steatohepatitis

NHANES: National Health and Nutrition Examination Survey

NREM: Non-Rapid Eye Movement

NSF: National Sleep Foundation

PSQI: Pittsburg Sleep Quality Index

RAS: Reticular Activating System

REM: Rapid Eye Movement

SCN: Suprachiasmatic Nucleus

SNP: Single Nucleotide Polymorphism

SWS: Slow Wave Sleep

TRP: Tryptophan

TSH: Thyroid-Stimulating Hormone

TUR-DEP: Turkey Diabetes, Hypertension, Obesity and Endocrinological Diseases Prevalence Study

WC: Waist Circumference

WHR: Waist Hip Ratio

WHO: World Health Organization

ABSTRACT

Oğuz Alibaşoğlu, Comparison of Breakfast Habits, Sleep Quality and Waist Circumferences of Nutrition and Dietetics Students in a Private University in İstanbul. Yeditepe University Institute of Health Sciences, Department of Nutrition and Dietetics, MSc Thesis, İstanbul, 2017.

Obesity has been regarded as a threatening factor that has a rapidly increased incidence in recent years and is a risk factor for many diseases. Sleep patterns and breakfast habits are among the factors that increase the risk of obesity in many age groups.

The study was carried out on 179 woman students who were registered to the Department of Nutrition and Dietetics at Yeditepe University and were in the age range between of 18-28 years and received written voluntary consent, following the approval of the ethics committee dated 07.12.17 and numbered 37068608-6100-15-1397. Questionnaire surveying sleep habits, meal skipping habits and reasons for skipping, living place characteristics and sleeping habits was performed and waist circumferences were recorded. Sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI). No significant relationship was found between breakfast skipping and waist circumference ($p = 0,143$, $p > 0.05$). There was no significant relationship between sleep quality and waist circumference according to PSQI ($p = 0,821$, $p > 0.05$) also there was no significant relationship between sleep quality and breakfast habit ($p = 0,310$, $p > 0.05$). Considering that sleep duration and quality are related to many diseases, precautions should be taken to improve sleep quality.

Keywords: Breakfast, Sleep Quality, Waist Circumference

ÖZET

Oğuz Alibaşoğlu, İstanbul'da Özel Bir Üniversitede Beslenme ve Diyetetik Bölümü Öğrencilerinin Kahvaltı Alışkanlıkları ve Uyku Kalitelerinin Bel Çevreleri ile Karşılaştırılması. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Anabilim Dalı Yüksek Lisans Tezi,İstanbul,2017.

Obezite son yıllarda görülme sıklığı hızla artış gösteren ve birçok hastalık için risk faktörü olan bir tehdit unsuru olarak kabul edilmiştir.Uyku düzeni ve kahvaltı alışkanlıkları da birçok yaş grubunda obezite riskini arttıran faktörler arasındadır. Çalışma 07.12.17 tarihli ve 37068608-6100-15-1397 sayılı etik kurul izni sonrası Yeditepe Üniversitesinde Beslenme ve Diyetetik Bölümü'nde okuyan, 18-28 yaş aralığında bulunan, yazılı gönüllü onamı alınan, 179 kadın öğrenci üzerinde yürütülmüştür. Katılımcılara; kahvaltı alışkanlıklarını, öğün atlama sıklıklarını ve nedenlerini, kalınan yer özelliklerini ve uyku alışkanlıklarını sorgulayan bir anket uygulanmış, bel çevreleri kaydedilmiştir. Uyku kaliteleri Pittsburgh Uyku Kalite İndeksi (PUKİ) ile ölçülmüştür. Bireylerin kahvaltı atlama alışkanlığı ve bel çevresi ilişkisi incelendiğinde aralarında anlamlı bir ilişki saptanamamıştır ($p=0,143$, $p>0.05$). PUKİ'ye göre uyku kalitesi ve bel çevresi arasında anlamlı bir ilişki bulunamamıştır ($p=0,821$, $p>0.05$). Uyku kalitesi ve kahvaltı atlama alışkanlığı arasında da anlamlı bir ilişki bulunamamıştır ($p=0,310$, $p>0.05$). Uyku süresinin ve kalitesinin birçok hastalıkla ilişkili olduğu göz önünde bulundurulursa, uyku kalitesinin düzeltilmesine yönelik önlemler alınmalıdır.

Anahtar Kelimeler: Kahvaltı, Uyku Kalitesi, Bel Çevresi

1.INTRODUCTION

Excessive daily caloric intake results in increased fat storage. Although a few pounds overweight does not pose a significant problem for most people, these pounds are associated with high blood sugar and high blood pressure (1). Two-thirds of American adults nowadays are obese or overweight (1). Similarly in Turkey 2/3 of the Turkish population in adult ages is overweight or obese (2). The ability of participants to survive and protect their bodies depends on the caloric intake sourced from food consumed.But the calories consumed and energy expenditure must be balanced to protect the ideal weight of the individual.Excessive caloric intake than required causes impaired energy balance and therefore leads to weight gain and obesity. Genes, the external world and many other factors are linked to weight gain. Recent studies show that genes from the family are effective on obesity. Furthermore eating patterns and lifestyles are also similar in families.The cultures to which the individual belongs are also effective on weight control. Some traditional foods are excessively high in fat and sweetened, making weight control more difficult. Also places where participants work and where they live also have an impact on their weight control (1).

The change,in the world which individuals live in is related to obesity in many ways. For example:with the development of transportation facilities and technology, individuals tend to sedanter lifestyle by choosing to drive instead of walking. With the same ease of reaching food and the inadequate time, individuals are heading to eat faster and cheaper food outside instead of cooking at home. Vending machines that make it easier for individuals to reach snacks while outdoors can be a source of high-fat, high-calorie foods instead of healthy snacks (1).

Healthy food choices have an important effect on weight loss and management. Those healthy choices may be like: increasing the amount of fruit and vegetables, preferring oat and whole wheat products instead of processed cereals, increasing consumption of high quality proteins such as fish, eggs, lean meats, unsalted nuts, poultry, preferring sugar-free products instead of high-sugar beverages, increasing water consumption (1).

Studies have shown that inadequate sleep constitutes a danger for obesity and diabetes(3-5). Furthermore some studies shown that poor sleep quality and sleep period are related with higher BMI scores. (6,7)

Participants who take big percentage of their energy requirement at breakfast meal are less related with being obese or overweight. It may be explained with participants who have breakfast habits, are slimmer than participants who skip breakfast(8-10).

The aim of this study is to examine the relationship between increased obesity rate and sleep quality, waist circumference and breakfast habits in university students.

2. GENERAL INFORMATION

2.1.Obesity

Obesity is a chronically defined disease with increased fat mass and associated increased morbidity and mortality rate as well as being defined by various pathophysiological pathways(11).

2.1.1.Determination of Obesity

One of the way of measuring obesity severity is body mass index (BMI).BMI is a most common and simple indicator. It is a big oppurtunity for patients to calculate their scores by one's own(12,13).

BMI is a clinically used ratio to classify stages of obesity in which weight in kilograms is divided twice by the length in meters(kg/m2). World Health Organisation (WHO) set values for different stages of obesity that divide the continuum into stages. A BMI equal to, or more than 25 means being overweight, equal to 30 or above means being obese. (14). BMI calculation misses one critic point that fat or fat free tissue ratios(15,16).BMI may be disleading due to that point. For instance, BMI is rating wrongly about body fat in individuals who have high muscle mass, and body fat in individuals who have decreasing muscle mass. BMI is a direct way to measure obesity regardless to sex (17).

Waist Circumference (WC) and Waist Hip-Ratio(WHR) are widely used markers for determinate visceral adipose tissue. Their values are associated with various chronic diseases and increased mortaliy risk of population (18,19).

Both BMI and WC have a strong relationship with total body tissue mass. Nevertheless WC is more powerfull determinative than BMI for calculating intra abdominal fat tissue and determining body fat ratio (20,21).

The distribution of adipose tissue in different regions of the body is under genetic control and it is different in men and women. The accumulation of fat in the lower part of the body(waist) is known jenoid type as the genotype and is usually women specific. The accumulation of fat on the upper side of the body (waist and upper abdomen) is called the android type and is men specific. Such fat reservoir is characterized by rapid mobilization of free fatty acids and is associated with hypertension, cardiovascular diseases and type 2 diabetes(22).

Classification according to BMI values and the relationship between BMI-WC values and disease risk are shown in Table 1(23).

Table 1: Combined recommendations of body mass index and waist circumference cut-off points made for overweight or obesity, and association with disease risk (23)

	Body mass index	Obesity class	Disease risk (relative to normal weight and waist circumference)	
			Men <102 cm Women <88 cm	Men >102 cm Women >88 cm
Underweight	<18.5			
Normal	18.5-24.9			
Overweight	25.0-29.9		Increased	High
Obesity	30.0-34.9 35.0-39.9	I II	High Very high	Very high Very high
Extreme obesity	>40.0	III	Extremely high	Extremely high

Waist circumference values according to various countries and ethnic groups are shown in Table 2 separately for women and men (23).

Table2: International Diabetes Federation criteria for ethnic or country-specific values for waist circumference (23).

Country or ethnic group	Sex	Waist Circumference(cm)
European	Men	>94
	Women	>80
South Asian	Men	>90
	Women	>80
Chinese	Men	>90
	Women	>80
Japanese	Men	>90
	Women	>80

Classification of individual nutritional status according to BMI values is shown in Table 3 (24).

Table 3: Classification of BMI Values (24)

BMI	**Nutritional status**
Below 18.5	Underweight
18.5–24.9	Normal weight
25.0–29.9	Pre-obesity
30.0–34.9	Obesity class I
35.0–39.9	Obesity class II
Above 40	Obesity class III

2.1.2.Prevelance of Obesity

Recently, obesity and overweight become a important and main health problem on global world. Furthermore obesity rate continues to rise (25-28).

In 2016, more than 1.9 billion adults aged 18 years and older were overweight in the world. Of these over 650 million adults were obese.In 2016, 39% of adults aged 18 years and over (39% of men and 40% of women) were overweight.Overall, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2016.The worldwide prevalence of obesity nearly tripled between 1975 and 2016.In 2016, an estimated 41 million children under the age of 5 years were overweight or obese. Once considered a high-income country problem, overweight and obesity are now on the rise in low- and middle-income countries, particularly in urban settings.

In Africa, the number of overweight children under 5 has increased by nearly 50 per cent since 2000. Nearly half of the children under 5 who were overweight or obese in 2016 lived in Asia.Over 340 million children and adolescents aged 5-19 were overweight or obese in 2016.The prevalence of overweight and obesity among children and adolescents aged 5-19 has risen dramatically from just 4% in 1975 to just over 18% in 2016. The rise has occurred similarly among both boys and girls: in 2016 18% of girls and 19% of boys were overweight.While just under 1% of children and adolescents aged 5-19 were obese in 1975, more 124 million children and adolescents (6% of girls and 8% of boys) were obese in 2016(14).

According to NHANES datas In 2015–2016, the prevalence of obesity was 39.8% in adults and 18.5% in youth. The prevalence of obesity was higher among middle-aged adults (42.8%) than among younger adults (35.7%). The prevalence of obesity was higher among youth aged 6–11 years (18.4%) and adolescents aged 12–19 years (20.6%) compared with children aged 2–5 years (13.9%)(29).

Average age of Turkish population over 12 years since TURDEP-I it has increased by 4 years. Compared TURDEP-I and TURDEP-II in 12 years, obesity increased in Turkey: 34% in women, 107% in men. It is noteworthy that obesity is more prevalent in women than in men. In general, 2/3 of the Turkish population in adult ages is overweight or obese (2).

The average men and women height increased by 1 cm; women weight increased 6 kg, waist circumference increased 6 cm, hip circumference increased 7 cm; for men, weight increased 8 kg, waist circumference increased 7 cm, hip circumference increased 2 cm(2).

2.1.3.The Role of Sleep in Etiology of Obesity

Apparently people who go to bed for sleep after 10.00 pm and sleep less than 6 hours tend to be more related with inappropriate behaviors like sedentary lifestyle, smoking, alcohol consumption, late night eatings. These inappropriate behaviors lead to impairment of blood glucose metabolism thus prediabetes and diabetes may occur (30-35).

Decreasing sleep duration and difficulties in falling asleep lead to low performonce, feeling depressive, and brings so many diseases such as obesity, hypertension, type 2 diabetes, cardiovascular diseases and premature mortality (36,37).

Sleep period and BMI, obesity, hunger mechanism, metabolic syndrome(MS), type 2 diabetes and hypertension have a converse relationship. Low sleep period leads to increased eating desire, overeating, and modifications on person's dietary patterns, and all this factors bring out obesity and it's relevant diseases.These alterations may be impact by serum leptin and ghrelin levels because low levels of serum leptin and high levels of serum ghrelin are related with low sleep period(38-48).

Some components may be used for quantitatively evaluation of sleep quality like total sleep time, sleep latency and number of awakenings (49,50).

Staying away from intensive exercise before sleep period and not being hungry or thirsty may be helpful for increasing sleep quality. Furthermore, lowering the consumption of caffeine, alcohol, nicotine containing products before sleep period and taking sleeping pills with medical advice may be useful on sleep quality. Avoiding from daytime sleep is important for sleep hygiene.Environmental conditions must be appropriateand comfy for high sleep quality, silence of around, adjusting time to rest before sleep period and regular sleeping habit may provide a better sleep quality(49,51,52).

Long or short term inadequate sleep and negative sleep quality may be effective on people's social, mental, emotional and physical parts(53-56).

Invidual's sleep status and emotinal regulations are in harmony and many instance shows us divided sleep and restricted sleep time may cause to high levels of negative feelings and lack in feeling good emotionally. (57-62).

2.1.4.Obesity and Health Problems

The factors that foster obesity may be related to genetic disturbances,inappropriate dietary habbits,low physical activity,medications,hormonal disorders,infections,long workshifts and stress. Due to these,the incidence of obesity is increasing and some chronic diseases are on the rise such as diabetes mellitus,hypertension,dyslpidemia,cardiovascular disease and cancer(63-69).

Obesity and overweight status leap up to various chronic diseases like as diabetes mellitus(Type 2) and it's complications diabetic nephropathy and meanwhile risk factor for atherosclerotic cardiac and cerebrovascular disease; arterial hypertension and it's complications, like hypertensive nephropathy and hypertensive cardiovascular disease; so many cancer types, psychological disturbances,arthritis, and liver disease(70-78).

The main association of obesity in children and adults comes from the inflammatory mediators. These mediators are C-reactive protein, tumor necrosis factor alpha, interleukin and mostly higher levels of leptin and the reduced levels of adinopectin. Furthermore, adinopectin has reversely associated with extra body fat and leptin haspositively related with excessive body fat storage, fat mass as obesity and elevated inflammatory markers can be directly connected with oxidative stress which is in reality an indicator for hyper-leptinemia and leptin resistance. Also, the alteration in adipokine secretion sometimes leads to disturbance of appetite and satiety, inflammation, high blood pressure, fat disruption, high insulin, energy expenditure, endothelial and hemostasis. It has been noticed that adiposity and leptin levels are highly correlated however, adinopectin levels has an inverse correlation in adults(79-87).

Type 2 diabetes, heart disease, high blood pressure, stroke, kidney disease, and certain cancers are some of the diseases which are associated with overweight. Obese or overweight men are more prone to prostate, colon and rectum cancer than men with normal weight. Obese or overweight women are more prone to cancers of breast, gallbladder, uterus, cervix.Esophageal cancer is also found to be associated with obesity(1).Other diseases related with overweight status are respiratory disorders; sleep apnea; fatty liver disease (nonalcoholic steatohepatisis(NASH)); gallbladder disease and gallstones; pregnancy problems, such as gestational diabetes, high blood pressure, and increased risk for ceserean section(1).

2.1.5.Obesity Treatment

2.1.5.1.Physical Activity

Physical activity refers to 'All physical movements resulting in energy expenditure (daily routines such as housework, shopping). Daily regular physical activity, healthy eatingwith the prevention of chronic diseasesare the most important thing.Physical activity may help individually prevention for chronic diseases. Socially it is effective on improving public health (88). Exercise constitutes a significant part of weight control. Exercise combined with energy-limited diet provides protection of lean mass and prevents resting metabolic rate from declining. Exercise is effective in spending fat touch for energy(22).

For encouraging to youths for a healthy lifestyle, appropriate weight and height, specific eating patterns should be created. Like restricting portion size of meals, bringing in eating more fruit and vegetables, encouraging family dinners and limiting eating out especially fast food restaurants(89,90).

2.1.5.2.Bariatric Surgery

Bariatric surgery is one of the most potent way used to treat obesity and it plays an important role in regulating appetite and reducing comorbidities of various diseases such as hypertension, dyslipidaemia and type 2 diabetes.Even tough bariatric surgery has positive effects on comorbidities of various diseases it was shown that bariatric surgery was related with psychological disorders(91-94).

Bariatric surgery reduces the size of the stomach to a certain level and this reduction leads to less absorption of certain nutrients as well as increased satiety. These operations have become more interesting nowadays, with many adults having BMI values of around 30 and 40 and entering the overweight or obese class.But it should be considered that it has may have secure complications and even may death. It has been observed that lifestyle changes (changing dietary habits and increasing the amount of physical activity) for 4-6 months lead to a loss of 5-10% in weight control. The risk factor for diseases such as diabetes and blood pressure decreases with weight loss but this is not sustainable and can lead to re-emergence of risk factors. Doctors may resort to other treatment modalities, especially since the sustainability of weight control in highly obese participants is more difficult than in other participants.Today the most powerful method for achieving weight loss and weight control for highly obese participants is the bariatric surgery(1).

2.1.5.3.Pharmacotherapy

Some types of medicines are effective in weight gain. For instance, steroids and some of the medicines that are used to treat depression and mental illness can cause weight gain and attention should be paid to weight control during the period when these drugs are used (1).
Obesity is considered as a disease and medicine treatment is emphasized. Drug treatment is used in mandatory situations and there can be various side effects(e.g addiction, adverse effects on heart and kidney, negativity in the blood levels of fat-soluble vitamins, insomnia). Utility of drug treatment depends on the behavioral change. By the use of medicines, inviduals who fall to a certain weight level gain weight in a short term by returning to their former state(22).
If comorbidities are seen in participantswith BMI values of 30 or more, or 27 or more according to the FDA, approval of the use of 9 different drug groups to achieve weight control. There are 4 drugs approved before 1973,which are benzphetamine, phendimetrazine, diethylpropion, and phentermine. All of these drugs were considered the first step in weight loss for short-term use.Phentermine is the most effective drug for weight control and weight loss, even if it is ideal for short-term use(95).

Drugs that are considered suitable for use by the FDA in the treatment of obesity are shown in Table4 (95).

Table4: Drugs Approved by the Food and Drug Administration for Obesity Treatment(95)

Generic Name	Trade Names	DEA Schedule	Approved Use	Year Approved
Benzphetamine	Didrex	III	Short Term	1960
Phendimetrazine	Bontril, Prelu-2	III	Short Term	1961
Diethylpropion	Tenuate	IV	Short Term	1973
Phentermine	Adipex, Ionamin	IV	Short Term	1973
Orlistat	Xenical, Alli	None	Long Term	1999
Lorcaserin	Belviq	IV	Long Term	2012
Phentermine + Topiramate-ER	Qsymia	IV	Long Term	2012
Bupropion-ER + Naltrexone ER	Contrave	None	Long Term	2014

ER: Extended Release, SOURCE: Presented by Susan Yanovski on April 6, 2017. Reprinted with permission.

2.1.5.4.Medical Nutritional Therapy

The aim of obesity treatment is to increase the amount of energy expenditure.The most important component of weight loss is the reduction of dietary energy. Low-calorie diet is 1000-1200 kcal / day for women and 1200-1600 for men kcal / day diets; diets below 800 kcal / day are also very low calorie found diets. In long-term use of low and very lowcalorie diets there has been no significant difference in weight loss between the two groups (96-98).In obesity treatment low-calorie diets are recommended(96,99). It is stated that reducing daily energy intake by 500-1000 kcal / day provides a slow but stable weight loss (96).

The content of acceptable macronutrient distribution ranges should be like that; %45-65 energy from carbonhydrate, %10-35 energy from protein, %20-35 energy from fat (100,101)

2.2.Meal Frequency and Breakfast Habits

2.2.1.Meal Frequency

Central obesity and BMI can be affected by meal habits such as eating density, count and type of consumed food. Participantswho eat three meals a day were found less likely to be obese compared to participantseating six meals a day. It was found that only snacks were related with the BMI when compared to meals and snacks for assessment of eating density, also consumption of snack food is related with getting fat(102-104).

The main common feature of low-calorie diet interventions is the regulation of density of meals, which means that eating regular meals is more effective on controlling weigt.Rise in meal density may be beneficial about total caloric intake hence management of weight control by cause of critic duty in resting metabolic rate and capability to reduce nitrogen missing throughout weight loss. The intervention to regulate eating times in obese people were found beneficial in weight loss and at the same time increased the quality of the diet(105-108).

Participantswho increase meal frequency and reduce portions during the day are less related to have a higher BMI, decreased risk for disease parameters such as; triglycerides, cholesterol and glucose metabolism thus have decreased risk for coronery health diseases and other metabolic diseases such as diabetes(109).Increasing the number of meals consumed during the day is effective on preventingfrom extra caloric intake, formation a more regular blood sugar level and the reduction in insulin release(109).

2.2.2.Breakfast Habits

During past two decade ratio of breakfast skipping and obesity dramatically grew (110).Indivuals take almost 20 percent of their energy requirements from breakfast.Skipping breakfast cause to binge eating of unhealthy products food then within day reason for starving.Thus breakfast is most important time for all of the day(111,112).

People with breakfast habits develop less visceral fat tissue. Furthermore breakfast skipping lead to higher BMI score and positive relationship with overweight and obesity(113-117).

Breakfast and contents of breakfast together affects BMI. Especially most of the people try to consume high fiber products cereals on their breakfast because of the information the high fiber products areeffectiveon weight loss and help tomanage glysemic response and decrease the risk for obesity and diabetes(118-121).

Omitting breakfast have harmful impacts on cardiometabolic risks like as higher score of waist circumference, elevated fasting blood sugar, low-density lipoprotein, and total cholesterol(122,123).Omitting breakfast is also related with lower quality diet and more consumption of extra energy and fatty foods at the rest of day (122,124,125).

Ingredients of foods consumed at breakfast are also related to mental performance. Participantswho eat whole-grain cereals, low glysemic index foods are less related with impairment in mental performance in postprandial hours (126,127).Participantswho consume higher quality protein at their breakfast, have better satiety, ghrelin, and peptide YY 3-36 levels than participantswho consume a lower quality(128,129).

When participantswho skip breakfast are compared with who do not skip breakfast, there were significant differences found such as who do not skip breakfast have a lower BMI score, WC, HOMA-IR (Homeostatic Model Assessment-Insulin Resistance) score, fasting insulin levels and total and LDL (Low Density Lipid) cholosterol levels than these who skip breakfast at the same time(130,131).Participantswho take more protein(20-30 g) at breakfast meal found to feel better than participantswhose consumption was basicly content cereal(15-20 g) at breakfast and they consumpt less food at lunch(110, 132).

2.3.Sleep

During last years ratio of sleep disorders increased in common with the obesity and diabetes mellitus in globally(133).

Decreased sleep period may lead to increased feeling of hunger through hormones like leptin and ghrelin. Prolonged awakening time may bring about more possiblityfor extra eating and under core body heat associated with insufficient sleep time might be affective on decreaseenergy expenditure and increase total energy intake (40,134-139).

Due to various sleep disturbances so many people feel sleepless or fall asleep mid day. Additionally, this situation is related with sleep deficiency and clinically relevant with who have psychiatric disturbances(For instance depression)(140,141).

We mayseperate factorswhich affect to sleep quality like ınternal factors (being sleep disturbances) and external factors(take over caffein,alcohol or drug habbit)(140,142).

Furthermore poor sleep quality may be effective on people numerous form,also mentally(Lose attention, working mind, distant future mind,make choice mechanism)(140,143).

Decreased sleep time also related with food decision and eating habits. Sleeping less than 7 hours in participants foundis related with less fruit and vegetable consumption and more energy intake and in terms of ingredients poor foods. Furthermore restricted sleep duration lead to caloric intake from fats more than caloric intake from carbonhydrates(144-148). Participantswhose sleep duration is five hours or less than five hours are inclined to be under the risk for obesity and all additonal extra sleep hours are related with areduction in BMI(149,150).

Sleep refers to "the communication of the organism's with environment in a way that is reversible with different vigorous stimuli partial, temporarily, periodically, disappearance. The most basic of human beings' one of the requirement is sleep, 'Maslow's Hierarchy of Need'so calledpyramid at the bottom; a regular night's sleep, all ages as one of the most important components of health and quality of life it is accepted(151-154).

Sleep is a staminal and a main daily activity for all people which spent higher time period than other activities. Sleep patterns and usual sleep periods are changeable among all people or even by countries. Furthermore for elder people results of a low sleep quality is related with lower attention, late answering, difficulty on memory and lower performance (155-161).

Sleep affect every main part of physiological systems of body, for instance thermobalance system,musculoskeletal, endocrine, respiratory, cardiovascular, gastrointestinal, and immune systems.Furthermore sleep affect individual's weight, psychological situation and total life quality(162).

Sleep deprivations are also associated with higher food consumption, increment on level of ghrelin, more brain activation in answer to visual food memory, lower levels of energy expenditure and induce more sedentary life, less activity(46,48,163-173).

2.3.1.CircadianRhythm

There are two Latin spoken-word circadian semantics, circa (approximate) and dies (day). It is used to express about one day. The rhythm is the period of time for a single cycle, the beginning and ending of the rhythm are defined as phases. The circadian rhythm is about one refers to the changes in the physiological and biological processes of daily life. The cycle of sleep awakein human, what is the most basic and determinative circadian rhythm (174-177).

Obesity may be a result of irregularity on circadian rhythms and circadian rhythm may lead to unchecked regulation of some biological compound such as lipids, glucose, and leptin (178-181).

Cyclic rhythms are regulating some of the metabolic events such as glucose, lipid homeostasis, and phospholipid metabolism(178,182-184).

Circadian rhythm is usually a constant term between 20h and 28h and corruptions of circadian rhythm are related with unbalanced energy metabolism. (185,186) Level of circadian rhythm is set by suprachiasmatic nucleus (SCN) which managesa complicated system by brain loops(185,187).Constituent of loops are separated like positive (CLOCK and BMAL1) and negative (PER and CRY) (185,188,189).

Single Nucleotide Polymorphism(SNP) may be effective in duration of gene transcription, translation and modification. Furthermore polymorphism genes of circadian may be effective on total adipose tissue (185,190).

Physical activity, food consumption, enviromental temperature and light have impact on SCN and peripheral clocks(191-194).

2.3.2.Sleep Physiology

Brain stem reticulate in the initiation and maintenance of sleep and wakefulness activating system (RAS), locus seruleus, dorsal raphe, basal forebrain, thalamus, hypothalamus and brain regions such as the cortex are known to participate(195,196).

How these brain regions function in many disorders with hypersomnia is still being investigated.Many neurotransmitters and peptides, such asnoradrenaline, serotonin, dopamine, GABA (gamma aminobutyric acid), acetylcholine, histamine, glutamate, adenosine, substance P, interleukin-1 and prostaglandins play an important role in sleep and wakefulness (195,197).

In the natural sleep cycle, there are two special areas that the brain stem controls. This areas are; 1) The Reticular Activating System (RAS), which is located in the brain stem, spinal cord and cerebral cortex, 2) Bulbar Synchoronizing Region (BRS), which is located in medulla. This two the system works together. RAS, wake-related cortical activities as well as reflex and the formation of voluntary movements, and during the sleep of the periphery of the body and some stimuli from the cerebral cortex can be detected, and vigilance. The reduction of stimuli reduces the activation in the system. Ache, external stimuli such as noise, pressure, etc., stimulate the RAS and the body's sleep that cause it to wake up. The activity of the bulb synchronizing zone increases sleepiness. That is, the activity of the reticular activating system is reduced and the activation of the bulb synchronizing zone increases the awake to the sleeping process and it makes the transition.(198-201)

2.3.3.Sleep Quality and Sleep Phases

2.3.3.REM-NREM:

Sleeping in the mammals, consists of the NREM sleep period, which is accompanied by rapid eye movements that recur at certain intervals, and the REM sleep period, accompanied by rapid eye movements. Sleep periods were determined by assessing eye movements and changes in muscle tone(202-204).

The state of sleep and wakefulness is characterized by biological rhythm and cycle (repetitive periods). This process, called the sleep cycle, is called NonREM (Non-Rapid Eye Movement) and REM (Rapid Eye Movement) is composed of stages called sleep. Normally,sleep begins with NonREM sleep. Non-REM sleep consists of four phases(205,206).

Non-REM I. and II.phase superficial sleep, III. and IV. the stage is called deep sleep. SWS is the deepest sleep (NonREM III and IV). NonREM phase I 2-5% of all night's sleep, 44-45% of NonREM II all night sleep, NonREM III and IV all night covers 20-25% of sleep REM sleep constitutes 20-25% of all night sleep(205,206).

NonREM sleep follows REM sleep. NonREM sleep induces physical rest, REM sleep provides for the realization of spiritual rest.For normal and healthy sleep, a certain sequence of periods, as well as a certain amount of the total amount of each night during the night need to reach. Normal sleep begins with NonREM sleep, the individual follows each during sleep. The nonREM passes four cycles of NonREM, then backward to NonREM IV, III, II rotary. Instead of returning to or waking up to NonREM I, the individual enters the REM phase, Itpasses NonREM, II, III, IV phases. If an individual wakes up in any of his sleep it returns to NonREM I, which is the starting phase of re-sleep.The average duration of it is 90-120 min.In the first half of the night both in terms of the number and duration of NonREM is dominant, in the second halfthe REM period is predominant. Falling in body temperature during sleep is particularly prevalent in these stages. Towards to the end of the universe this decline becomes regular.In the REM period, autonomic nerve heart rate, respiratory rate, blood pressure increase and become irregular, eye movements accelerate, muscle tone disappears completely.The dreams mostly occur in REM and when the person is awakened he/she can tell his dream to the finest detail(205,206).

In humans, the first, second, third and fourth periods of NREM sleep occur after the initial awakening period. The first REM period occurs about 90 minutes after the onset of sleep. The period from the onset of sleep to the end of the first REM sleep is a sleep cycle.This cycle varies from person to person between 90 and 120 minutes and the cycle in the form of NREM + REM is repeated 4-6 times in a night. The first REM period is usually shorter and takes about 5-15 minutes. In terms of duration, NREM dominates in the first half of the night and REM sleep in the second half. Even peoplesleep for a short time, the quiche is reported to be more rested when awakened at the end of his return(202-204).

As a summary:

Non-REM Sleep Period = NREM Sleep occurs within 4 periods in itself (202,207).

NREM sleep 1 st term: It forms 1-5% of all night sleep.

NREM sleep 2 nd term: It constitutes 40-50% of all night sleep.

NREM sleep 3 rd term: It forms 3-8% of all night sleep.

NREM sleep 4 th term: It forms 10-15% of all night sleep.

2.3.4.Sleep and Hormones:

The complexity of the interactions of hormones and sleep in elderly and unhealthy people are very different.It has been shown that there is a high collision between growth hormones and the occurrence of SWS according to the hypothalamic pituarity osmotrophic system. During sleep the GH levels increase especially during the first stage of SWS. It has been shown and proved that the GH occurs every 2 hours with the appearence of the SWS. The largest pause of GH is released when the human is awake at the beginning of the night. Moreover, GH can be increased when SWS is initiated parhamcologically by gamma-hydroxyureas(208-211).

The circadian power is noticed in the hypothalamic pituitary adrenocortical system. In the middle of the night the level of cortisol elevates, especially at the deepest sleep and early morning. But the cortisol has never been affected by sleep, which confirms the inluence of the circadian via the SCN pathway. However, the blood infusion to the human being could increase SWS or decrease REM physiologically(208,212-214).

Thyroid stimulation hormone (TSH) has a direct circadian effect, which is rare throughout the morning and it increase before sleeping and reaches it max in the middle of the night. However, it can be affected by sleeping depravation even if it was for one night because of the interactions of triiodothyronine (T3) and the increase of the TSH levels. On the other hand, there has not been shown any (T3) or thyroxine (T4) connections at all(208,215,216).

2.3.5.Effects of Diet on Sleep Quality

It has been found that participantswho consume milk and cornflakes at mealtimes are more likely to be associated with uninterrupted sleep(217-220).Studies have shown that the amount of milk consumed in different quantities does not have any effect on sleep(217-219).

Studies have shown that when melatonin-rich milk is consumed more than standard milk, more vigorous awakening and better sleep quality and rest are seen(217-219). In the same way when Lactobasillus-helveticus-fermented milk is consumed more than standard milk, sleep problems are fixed and sleep interrupts are decreased(217,218,220).

In a study conducted with twice a day consumption of cherry juice has found positive effects in reducing sleeplessness and decreasing the amount of sleep before sleeping(217,218,221).A study has shown that 2 portions of kiwi consumption induces better sleep quality(217,218,222).

Tryptophan(TRP) is a precursor to the release of serotonin and they are associated with both sleep and awake conditions(217,218,223,224).A study showed that TRP and a reduced total protein consuming diet increases the duration of REM-sleep period but does not haveeffect total sleep duration and NON-REM-sleep duration(217,218,225).In another study contrary to those above, it was observed that 250 mg TRP reinforcement enhanced sleep quality(217,218,226,227).

When compared to the two groups that sleep less than 5 hours a day and sleep normally, those who are less sleeping have more 420 Kj of daily energy intake from carbonhydrates(217,218,228).Another studies showed that more sleepers consume more carbonhydrates than those who sleep less(217,218,229,230). It was observed that consumption of carbonhydrates in the newborns was associated with longer sleep durationon (0.8 min/gr) (217,218,231).

It was observed that the ingestion of foods with high glysemic index in the children who walk new was associated with prolonged sleep(1.3 min/gr)(217,218,231). In another study, it has been found that carbonhydrate consumption with high or low glysemic index has no effect on sleep(217,218,232).

Studies have shown that the duration of short sleep is related with increased fat consumption(217,218,228-231,233-235). Although high-fat low-carbonhydrate diets did not affect sleep duration, some effects on REM and NON-REM sleep were found(217,218,236-238).

Protein-containing foods make it easy to fall asleep. Carbonhydrates also affect serotonin levels, causing calmness and comfort in the individuals. Weight loss leads to shortening of sleep duration, premature awakening and division of sleep, while weight gain causes prolonged awakening in the sleeping period. Nicotine is a stimulant and makes sleeping difficult. Falling asleep in smokers may become a problem also smokers may have a milder sleep. It has been determined that non-smokers fall asleep easier after the evening meals and provide better sleep(216,217,239,240).

Generally, serotonin promotes awakeness and suppresses sleep.Serotonergic neurons stimulate many brain regions that affect sleep-wake behavior.One of the strongest ways of serotonin regulation of sleep is alterations in melatonin concentration. Because serotonin is an intermediate product in the synthesis of melatonin(217,218).

Deficiencies of magnesium or group B vitamins may also damage sleep quality and quality.Physiologically, it is based on mediating neurotransmission by interacting with the synthesis of serotonin and melatonin(217,218).

Vitamin 12 plays an important role in the release of serotonin(218,241). Vitamin12 intervention in different doses provides a good sleeping-wake cycle and good sleep quality(218,242,243). Niacin also showed positive effects on REM sleep and helps to reduce sleeplessness (217,218,244).

2.3.6.Sleep Requirements

Recommendations about appropriate sleep duration includes ideal ranges for several age groups. The meta-analyzes obviously showed that lower sleep periods are related with higher risk for metabolic and cardiovascular diseases(245-247).

According to the last report published by National Sleep Foundation(NSF), the ideal sleep intervals for certain age groups were determined as follows: (248)

- Newborns (0-3 months): Sleep range narrowed to 14-17 hours each day (previously it was 12-18)
- Infants (4-11 months): Sleep range widened two hours to 12-15 hours (previously it was 14-15)

- Toddlers (1-2 years): Sleep range widened by one hour to 11-14 hours (previously it was 12-14)
- Preschoolers (3-5): Sleep range widened by one hour to 10-13 hours (previously it was 11-13)
- School age children (6-13): Sleep range widened by one hour to 9-11 hours (previously it was 10-11)
- Teenagers (14-17): Sleep range widened by one hour to 8-10 hours (previously it was 8.5-9.5)
- Younger adults (18-25): Sleep range is 7-9 hours (new age category)
- Adults (26-64): Sleep range did not change and remains 7-9 hours
- Older adults (65+): Sleep range is 7-8 hours (new age category)

3. MATERIAL AND METHODS

3.1.Ethical Approval

Before starting the study,the necessary permission for the execution of the thesis was obtainedfrom the Yeditepe University clinical research ethichs committee, with the number of 37068608-6100-15-1397 and the application number of 1372 (Appendix1).

3.2.Participants

This study was conducted on a total 186students, who are registered to the 1st, 2nd, 3rd and 4thclasses of the Faculty of Health Sciences, Department of Nutrition and Dietetics in Yeditepe University.7 man of the total participants were not included in this study. As the number was not comparable and WHO criteria for women and men differ for WC. The study continued with 179 woman.None of the man participants have a waist circumference of above 102 cm, which WHO has determined for men, and are therefore not included in the study.

Participants have received a written consent form that they voluntarily participated in the work (Appendix2).

A questionnaire consisting of the participants' height, weight, age, waist circumference, sex and class information and 12 questions were applied. A questionnaire was created by the researchers to determine participant's breakfast habits, meal skipping, meal frequency, place of residence, total sleep duration and sleeping patterns, and this questionnaire was applied to participants. (Appendix 3) The questionnaire form was applied through face-to-face interview with the participants.

3.3.Measures

A non-flexible tape was used to measure the waist circumference of the individual. The thickness of the clothes on the individual was taken into account during the measurement. It has been said that when the measurement is made, the individual must release their bodies, withdraw their abdomen, and release their breath.

In this study the rules set by WHO for waist circumference measurement were applied and accordingly this calculating waist perimeter should be measured to the closest midpoint between the lower line of the last detectable rib and the high point of iliac crest (23).

WHO values for waist circumference was used as reference.In this respect, waist circumference measurement is <102 cm for men and <88 cm for women was considered healthy (23).

3.4.Pittsburgh Sleep Quality Index

PSQI was developed by Buysse et al. (50) in 1989 and has shown to have sufficient internal consistency, test-retest reliability and validity. Reliability and validity of the scale in our country were made by Agargün and his colleagues in 1996, and Cronbach Alpha internal consistency coefficient was determined as 0.804 (249). Evaluating the individual's sleep quality for the last month, PSQI contains a total of 24 questions. 19 of these are self-report questionnaires and answered by the patient himself. Five questions are answered by the patient's partner or roommate and used only for clinical information, not to score(Appendix 4).

Self-esteem questions include various factors related to sleep quality. The 18 items involved in the rating are grouped into 7 component points. These components include; (component 1), sleep latency (component 2), sleep duration (component 3), usual sleep activity (component 4), sleep disturbance (component 5), sleep pacemaker use (component 6) and daytime sleep disturbance (component 7). Each question s

evaluated with a number from 0 to 3. The sum of the scores of the seven components gives the total PSQI score. The total PSQI score is between 0-21. Those with a total score of 5 or less had a "good" sleep quality; sleep quality above 5 is considered "bad". The diagnostic sensitivity and specificity (89.6% and 86.5%, respectively) were significantly higher than the PSQI in distinguishing the good and the bad sleepers.A total global PSQI score over 5 indicates clinically poor sleep quality(153,217).

3.5.Statistical Analyses

SPSS 24 windows version was used in the analysis of the data. It is considered statistically meaningful that the p value is as small as 0.05. The normal distribution fitness of the data was tested with the Shapiro wilk test. Mann whitney u test was used for comparison of non-distributive numerical variables in 2 groups and Kruskal Wallis test was used for comparison in 2 denier groups. Relationships between categorical variables were tested by chi-square test. Giving the participants the choice of more than one option in some questions led to different results in the numerical values of some question answers.

4. FINDINGS

4. General Features

Age features and age range of participants are shown in Table 5.

Table 5. Age Features of Participants

	N	Min	Max	Average	Standard Deviation
Age	179	18,00	28,00	20,91	1,50

179 volunteers participating in the survey have ages ranging from 18.00 to 28.00.Participants' overall age was 20,91.

Participants' BMI distributions are shown in Table 5.1.

Table 5.1.BMI Distribution of Participants

Variables		Number	%
BMI Degree	<18.5	23	12,8
	18.5 - 24.99	146	81,6
	25.00-29.99	10	5,6

179 volunteers participating in the survey have BMI scores ranging from 15,80 to 29,40.Participants' overall BMI score was 20.26. 12.8% of participants had a BMI score below 18.00 which is considered to be underweight.81.6% of participants had a BMI score between 18.00 and 24.99 which is considered as a normal range. 5.6% of participants had a BMI score was between 25.00 and 29.99 as an indicator of being overweight.

The height, weight, BMI and waist circumference values of participants are shown in Table 5.2.

Table 5.2.Body Weight, Height, BMI and Waist Circumferences of The Participants

Variables	N	Min	Max	Average	Standard Deviation
Height	179	150,00	184,00	165,24	5,81
Weight	179	42,00	83,00	55,37	7,54
BMI	179	15,80	29,40	20,26	2,42
Waist Circumference (cm)	137	58,00	104,00	72,88	7,88

The mean BMI values according to participants' class grades are shown in Table 5.3.

Table 5.3.Comparison of Mean BMI ScoresAccording to Class

Variables	**1 (n=45)**	**2 (n=28)**	**3 (n=63)**	**4 (n=50)**	**Chi-square**	**P***
BMI	20,54 ± 2,6	21,86 ± 3,18	19,86 ± 2,55	20,31 ± 2,12	9,622	0,020

Kruskal Wallis Test

*p <0.05 accepted as a statistically significant

The mean BMI score of 45 students who said study in 1st class was found as 20,54 ± 2,6. The mean BMI score of 28 students who indicated study in 2 nd class was found as 21,86 ± 3,18. The mean BMI score of 64 students who expressed study in 3 rd class was found as 19,86 ± 2,55. The mean BMI score of 50 students who expressed study in 4 th class was found as 20,31 ± 2,12.

A statistically significant difference was observed between the classes of the students read of BMI scores (p=0.020,*p <0.05).

According to all pairwise multiple comparison test there was a statistically significant difference between the BMI scores of the 2 nd and 3 rd class students (p=0.020,*p <0.05). and there was no statistically significant difference between the BMI scores of the other classes was observed.

The mean Waist Circumferences according to participants' class grades are shown in Table 5.4.

Table 5.4.Comparison of Mean Waist CircumferencesAccording to Class

Class	Mean	N	Std. Deviation
1=1	73,0222	45	7,14617
2=2	75,6852	27	17,80727
3=3	70,8500	30	6,72508
4=4	72,8333	42	8,99367
Total	73,0139	144	10,39566

The mean WC of 45 students who said study in 1st class was found as 73,02 ± 7,14. The mean WC of 27 students who indicated study in 2 nd class was found as 75,68 ± 17,80. The mean WC of 30 students who expressed study in 3 rd class was found as 70,85 ± 6,72. The mean WC of 42 students who expressed study in 4 th class was found as 72,83 ± 10,39.

Waist circumference average of participantsaccording to WHO's classification shown in Table 5.5.

Table 5.5.Waist Circumference Average of ParticipantsAccording to WHO's Classification

Waist Circumference		**Number**	**%**
	<88	129	94,2
	>88	8	5,8

Of the 179 participants who participated in the study, 137 were volunteered by accepting the waist circumference measurement. As a result of the subject participants' examination in the, the average waist circumference was found as 72,88 cm. %94,2 of participants had waist circumference less than 88 cm, %5,6 of participants had a waist circumference greater than 88 cm.

The mean waist circumference of 129 participantswhose waist circumference wasbelow 88 cm was found as71,63 ± 6,1cm.The meanwaist circumference of 8 participantswith waist circumference above 88 cm was found as93,13 ± 5,41 cm.

Waist circumference means <88 cm and >88 cm waist circumference and standard deviation are shown in Table 5.6.

Table 5.6.Waist circumference means <88 cm and >88 cm waist circumference and standard deviation

	<88 (n=129)	**>88 (n=8)**	**Z**	**P***
Waist Circumference cm	71,63 ± 6,1	93,13 ± 5,41	-9,729	0,001*

Mann-Whitney-U Test.

*p <0.05 accepted as a statistically significant

The relationship between participants' breakfast skipping status and waist circumference values is shown in Table 5.7.

Table 5.7.Relationship Between Breakfast Skipping and Waist Circumference

		Waist Circumference					
		<88		**>88**			
		Number	%	Number	%	➢ Chi-square Test	P*
Breakfast Skipping	Yes	17	13,2	2	25,0	3,888	0,143
	No	62	48,1	1	12,5		
	Sometimes	50	38,8	5	62,5		

*p <0.05 accepted as a statistically significant

13.2 percent of participants who had waist circumference lower than 88 cm had missed breakfast meal, 48.1 percent had not skipped breakfast meal, and 38.8 percent had skipped breakfast meal occasionally. There was no statistically significant relationship between waist circumference and skipping breakfast meal (p=0,143, p>0,05).

Participants' meal skipping status and the frequency of meal skipping are shown in Table 5.8.

Table 5.8.Frequency and Reasons For Meal Skipping of Participants

Variables		Number	%
Do you skip meals?	Yes	136	76,0
	No	43	24,0
Why do you skip meals?	Inadequate time	87	56,5
	Economic reasons	1	0,6
	Cannot find suitable options	24	15,6
	No appetite	24	15,6
	Other	18	11,7

76%participants skipped meals and 24%of participants did not skip meals. When participants were asked about the reasons for skipping meals, 56.5%said they hadınadequate time, 15.6 %said they could not find suitable options, 15.6%had no appetite, and 11.7 %said it was due to other reasons.

The relationship between participants' meal skipping status and waist circumference is shown in Table 5.9.

Table 5.9.Meal Skipping and Waist Circumference Relationship of Participants

Variables	Yes (n=106)	No (n=31)	Z	P*
Waist Circumference cm	72,95 ± 8,37	72,66 ± 6,02	-0,391	0,696

Mann-Whitney-U Test

*p <0.05 accepted as a statistically significant

Mean ofwaist circumference of the 106 participants who indicated that they skipped the meal was found 72,95 ± 8,37 cm,the mean waist circumference of the 31 participants who did not skip meals was found 72,66 ± 6,02. There was no statistically significant relationship between meal skipping and waist circumference (p=0,696, p>0,05).

The most frequent meals of participants' are shown in Table 5.10.

Table 5.10. Most Skipped Meals and Meal Skipping Frequency

Meals		Number	%
Breakfast	Yes	67	43,5
	No	87	56,5
Mid-	Yes	60	39,0
morning	No	94	61,0
Lunch	Yes	39	25,3
	No	115	74,7
Afternoon	Yes	39	25,3
	No	115	74,7
Dinner	Yes	9	5,8
	No	145	94,2
Night	Yes	23	14,8
	No	132	85,2

The most skipped meals by participants were stated as breakfast, while dinner were noted as least skipped. 43.5%of the participants expressed that they skipped breakfast. 39,0%of the participants said that they skipped mid-morning meals. 25,3%of the participants indicated that they skipped lunch meals. 25,3% of the participants said that they skipped afternoon meals. 5,8% of the participants said that they skipped dinner. 14,8%of the participants expressed that they skipped night meals.

The relationship between the participant's living place and the average waist circumference values is shown in Table 5.11.

Table 5.11.Living Place and Waist Circumference Relationship of Participants

Variables	Living with Friends (n=39)	Living with Family (n=54)	Dorm (n=21)	Living Alone (n=23)	Chi-square	P*
Waist Circumference cm	73,24 ± 9,24	71,64 ± 7,75	74,57 ± 5,06	73,65 ± 7,8	4,874	0,181

Kruskal Wallis Test

*p <0.05 accepted as a statistically significant

The mean waist circumferences of the 39 participants who stated they live wity their friends was found as 73,24 ± 9,24, the mean of waist circumferences of the 54 participants who stated they live with their family was found as 71,64 ± 7,75, the mean of waist circumferences of the 21 participants who stated they live at dorm was found as 74,57 ± 5,06, the mean of 23 participants who stated they live alone was found as 73,65 ± 7,8. Statistically no significant relationship was found between living place and waist circumference(p=0,181,p>0,05), but the lowest waist circumference was found in participants who live with their families.

The relationship between participants' sleep duration and average waist circumference values is shown in Table 5.12.

Table 5.12.Sleep Duration and Waist Circumference Relationship of Participants

Variables	4-6 hours (n=31)	6-8 hours (n=85)	8-10 hours (n=19)	>10 hours (n=2)	Chi-square	P*
Waist Circumference cm	72,26 ± 8,53	73,06 ± 8,12	72,53 ± 5,94	78,5 ± 2,12	3,079	0,380

Kruskal Wallis Test

*p <0.05 accepted as a statistically significant

The mean waist circumference of the participants was 72,26 ± 8,53 cm, indicating the total sleeping time was 4-6 hours, the average waist circumference of the participants was 73,06 ± 8,12cm, indicating the total sleeping time was 6-8 hours; the average waist circumference of the participants was 72,53 ± 5,94cm, indicating the total sleeping time was 8-10 hours, the average waist circumference of the participants was 78,5 ± 2,12cm, indicating the total sleeping time was more than 10 hour. Statistically no significant relationship was found between sleep duration and waist circumference (p=0,380, p>0,05) but the individuals who have more than 10 hours sleep duration had the greatest waist circumferences.

The relationship between participants' sleeping duration and breakfast skipping situations is shown in Table 5.13.

Table 5.13.Relationship Between Sleep Duration and Breakfast Skipping

	Sleep Duration									
	4-6 hours		6-8 hours		8-10 hours		>10 hours		Chi-square	P*
Breakfast Skipping	Number	%	Number	%	Number	%	Number	%		
Yes	8	22,9	16	13,8	5	19,2	0	0,0	5,577	0,473
No	13	37,1	58	50,0	8	30,8	1	50,0		
Sometimes	14	40,0	42	36,2	13	50,0	1	50,0		

Chi-square Test

*p <0.05 accepted as a statistically significant

22.9% of participants who expressed that their sleep duration was between 4-6 hours also indicated that they skipped breakfast meal, 37.1% stated that they did not skip breakfast meal and 40.0% stated that they sometimes skipped breakfast meal. 13.8% of participants who expressed that they were between 6-8 hours also indicated that they skipped breakfast meal, 50% stated that they did not skip breakfast meal and 36.2% stated that they sometimes skipped breakfast meal. 19.2% of participants expressed that they slept between 8-10 hours also indicated that they skipped breakfast meal, 30.8% stated that they did not skip the breakfast meal and 50% indicated that they sometimes skipped breakfast meal. 50% of participants sleeping over 10 hours said they skipped breakfast, while 50% said they sometimes skipped breakfast. There was no statistically significant relationship between sleep duration and breakfast skipping(p=0.473, p>0,05).The relationship between participants' sleep quality status and average waist circumference values is shown in Table 5.14.

Table 5.14.Relationship Between Sleep Quality and Waist Circumference

Variables	**<5 (n=32)**	**>=5 (n=105)**	**Z**	**P***
Waist Circumference cm	72,97 ± 8,51	72,86 ± 7,72	-0,227	0,821

Mann-Whitney-U Test

*p <0.05 accepted as a statistically significant

The average waist circumference of 32 participants with a sleep quality score of less than 5 according to PSQI was 72,97 ± 8,51 cm and the average waist circumference of the 105 participants with a sleep quality score of 5 and above 5 to PSQI was 72,86 ± 7,72 cm. There was no statistically significant relationship was found between sleep quality and waist circumference (p=0,821, p>0,05).

The relationship between participants' sleep quality status and breakfast skipping status is shown in Table 5.15.

Table 5.15.Relationship Between Sleep Quality and Breakfast Skipping

		Index Score					
		<5		>=5			
		Number	%	Number	%	Chi-square	P*
Breakfast Skipping	Yes	6	13,0	23	17,3	2,341	0,310
	No	25	54,3	55	41,4		
	Sometimes	15	32,6	55	41,4		

Chi-square Test

*p <0.05 accepted as a statistically significant

According to PSQI, 13% of participants with a score below 5 indicated that they skipped breakfast, 54.3% stated that they did not skip breakfast, and 32.6% stated that they sometimes skipped breakfast.According to the PSQI, 17.3% of the participants with scores 5 and above 5 indicated that they skipped breakfast, 41.4% stated that they did not skip breakfast, and 41.4% stated that they sometimes skipped breakfast. There was no statistically significant relationship was found between sleep quality and breakfast skipping(p=0,310, p>0,05).

The relationship between participants' non-routine sleep frequency and sleep irregularities is shown in Table 5.16.

Table 5.16.RelationshipBetween Non-Routine Sleep Frequency and Sleep Irregularities

Variables		**Number**	**%**
Take a Nap During Day	Yes	67	37,4
	No	112	62,6
Sleep Irregularities	Yes	94	52,5
	No	85	47,5

37.4% of the participants stated that they slept at any time of day none of their routine sleep, while 62.6% stated that they did not sleep extra none of their routine sleep.52.5% of participants stated that they had sleep irregularities, while 47.5% stated that they did not have sleep irregularities.

The relationship between participants' sleep irregularities and appetite status is shown in Table 5.17.

Table 5.17.Relationship Between Sleep Irregularities and Appetite

Variables		**Number**	**%**
Appetite Situation	Increased Appetite	45	34,1
	Decreased Appetite	38	28,8
	There is no appetite change	49	37,1

It is asked about changes in appetite status in the period when participants were experiencing sleep disorder, 34.1% stated that their appetite was increased, 28.8% had decreased appetite, and 37.1% stated that there was no change in appetite status.

The relationship between participants' sleep irregularities and food preferences change is shown in Table 5.18.

Table 5.18.Sleep Irregularities and Food Preferences

Variables	Number		%
Change of Food Preferences	Yes	89	67,9
	No	42	32,1
Increased consumption of packaged foods	Yes	47	43,1
	No	62	56,9
Increased consumption of sweet	Yes	54	49,5
	No	55	50,5
Increased consumption of fatty foods	Yes	24	22,0
	No	85	78,0
Decreased consumption of foods	Yes	30	27,5
	No	79	72,5

67.9% of the participants stated that their food preferences had changed during the period of sleep irregularities,43.1% of participants indicated that the consumption of packaged food increased during the period of sleep irregularities, 49.5%of participants indicated that the consumption of sweet food increased during the period of sleep irregularities, 22.0%of participants indicated that the consumption of fatty food increased during the period of sleep irregularities, 27.5% of participants indicated that the consumption of food decreased during the period of sleep irregularities.

The relationship between the place where the participants live and the frequency of meal skipping is shown in Table 5.19.

Table 5.19.Living Place and Meal Skipping Frequency

Variables		Place of Residence									
		Living with Friends		Living with Family		Dorm		Living Alone			
		Number	%	Number	%	Number	%	Number	%	Chi-square	P*
Breakfast Skipping	Yes	11	21,2	11	14,7	4	14,3	3	12,5	3,708	0,716
	No	18	34,6	35	46,7	14	50,0	13	54,2		
	Some-times	23	44,2	29	38,7	10	35,7	8	33,3		
Meal Skipping	Yes	44	84,6	60	80,0	18	64,3	14	58,3	8,981	0,030*****
	No	8	15,4	15	20,0	10	35,7	10	41,7		
Breakfast	Yes	24	50,0	28	41,2	10	50,0	5	27,8	3,129	0,372
	No	24	50,0	40	58,8	10	50,0	13	72,2		
Mid-morning	Yes	19	39,6	25	36,8	6	30,0	10	55,6	2,905	0,406
	No	29	60,4	43	63,2	14	70,0	8	44,4		
Lunch	Yes	12	25,0	19	27,9	6	30,0	2	11,1	2,403	0,493
	No	36	75,0	49	72,1	14	70,0	16	88,9		
Afternoon	Yes	9	18,8	18	26,5	5	25,0	7	38,9	2,897	0,408
	No	39	81,3	50	73,5	15	75,0	11	61,1		
Dinner	Yes	2	4,2	6	8,8	0	0,0	1	5,6	2,587	0,460
	No	46	95,8	62	91,2	20	100	17	94,4		
Night	Yes	4	8,3	13	19,1	1	4,8	5	27,8	6,665	0,083
	No	44	91,7	55	80,9	20	95,2	13	72,2		

*p <0.05 accepted as a statistically significant

21.2% of the participants who said that they live with friends at home said they had skipped the breakfast meal, 34.6% said that they did not skip breakfast meal, 44.2% said they sometimes skipped breakfast meal.14.7% of the participants who indicated that they live with their family expressed that they skipped breakfast, 46.7% expressed they did not skip breakfast and 38.7% expressed they sometimes skipped breakfast.14.3% of the participants who stated that they live at the dorm said that they skipped breakfast meal, 50.0% expressed that they did not skip breakfast meal and 35.7% indicated that they sometimes skipped breakfast meal.12.5% of the participants who said that they were livealone at home indicated that they skipped breakfast, 54.2% expressed that they did not skip breakfast meal and 33.3% said they sometimes skipped breakfast meal.

84.6% of participants who expressed they live with friends at home stated that they skipped meals, while 15.4% stated that they did not skip meals.80.0% of participants who said they live with their family indicated they skipped meals, while 20.0% stated that they did not skip meals.64.3% of participants who say theylive atdorm stated that they skipped meals, while 35.7% stated that they did not skip meals.58.3% of the participants who said that they live alone at home stated that theyskipped meals, while 41.7% stated that they did not skip meals.Participants who said they stayed with family at home and friends at home had a higher rate of skipping meals than other participants ($p = 0.030, p < 0.05$).

The relationship between participants' class and sleep quality is shown in Table 5.20.

Table 5.20.Sleep Quality and Grade

		PSQI Score					
		1= <5		2= >=5			
		Number	%	Number	%	Chi-square	P*
Class	1=1	11	22,9	34	24,6	0,576	0,902
	2=2	6	12,5	22	15,9		
	3=3	18	37,5	45	32,6		
	4=4	13	27,1	37	26,8		

Chi-square Test

*p <0.05 accepted as a statistically significant

22.9%of the participants whose PSQI scores were less than 5 indicated that they were in the first class, 12.5% indicated that they were in the second class, 37.5% indicated that they were in the third class and 27.1% indicated that they were in the fourth class.

24.6%of the participants whose PSQI scores 5 and above 5 indicated that they were in the first class, 15.9%indicated that they were in the second class, 32.6%indicated that they were in the third class and 26.8%indicated that they were in the fourth class.

Therewas no statistically significant relationship between sleep quality and classroom relations of the students (p=0,902, p>0,05).

The relationship between participants' sleeping duration and their non-routine sleep relationship status is shown in Table 5.21.

Table 5.21.Sleep Duration and None-Routine Sleep Relationship

		Take a Nap During Day					
		1=Yes		2=No			
	Hours	Number	%	Number	%	Chi-square	P*
SleepTime	1=4-6	17	23,6	18	15,8	3,895	0,273
	2=6-8	41	56,9	81	71,1		
	3=8-10	13	8,1	14	12,3		
	4= >10	1	1,4	1	0,9		

Chi-square Test

*p <0.05 accepted as a statistically significant

23.6% of the participants who stated that they sleep extra during the day in addition to their routine sleep period sleep 4-6 hours a day, 56.9% of the participants who stated that they sleep extra during the day in addition to their routine sleep period sleep 6-8 hours a day, 8.1%of the participants who stated that they sleep extra during the day in addition to their routine sleep period sleep 8-10 hours a day, 1.4% of the participants who stated that they sleep extra during the day in addition to their routine sleep period sleep above10 hours a day.

There was no statistically significant relationship was observed between sleep duration and non-routine sleep (p=0,273, p>0,05).

5.DISCUSSION

In this study, the participants' average BMI was found to be 20.26 kg / m2. As expected in university students, the mean BMI value was found in the ideal range.

Similarly,Peltzer and his colleagues conducted a study with 9725 participants from various ethnic backgrounds, the average BMI for women was found to be 22.0 kg / m2 (250).The average BMI value of 204 woman participants was found to be 22.3 kg/m2 in the study conducted by Anderson and his colleagues from a total of 279 participants (251).In a study conducted by Stefan and colleagues among a total of 198 university students, the mean BMI value of 112 woman participants was found to be 21.81 ± 2.70 kg/m2 (252)

The average WC of participants in this study was found to be 72.88 cm.Peltzer and his colleagues conducted a study with 9725 participants from various ethnic backgrounds, the average WC for women was found to be 73.8 cm (250).The study conducted by Pengpid and colleagues among 800 university students found that the mean WC value of 259 woman students was 76.2 cm (253).The average WC value of 217 woman participants was found to be 83.84 ±14.93 in the study conducted by So and their colleagues among 415 voluntary university students (254).

This might be due to education level of students. This study conducted on nutrition and dietetic students and this may be related to their attention to the appearance of the students and to their being more cautious about weight control than other departments and faculty.
In addition, nutrition and dietetics students' eating habits, weight control, body weight, BMI, WC can be seen in more controlled levels than other students due to their level of nutrition knowledge and education they receive. Participants involved in this work are college students and age ranges are at lower levels. It might be younger individuals are more careful about weight control and appearance than elderly individuals may also have affected this situation.

There was no statistically significant difference between sleep duration and waist circumference in this study. In contrast, Peltzer and his colleagues found that there was a positive relationship between sleep duration and WC (250).In addition, the number of groups with low WC and highWC was very different in this study. Sleep duration and waist circumference averages were also found statistically significant in the study conducted by Haghighat Doost and his colleagues(255).

Incontrast,in a study it had been found that PSQI scores as known the components sleep period, sleep latency, sleep disorders, and daytime dysfunctions and these components are significantly related with obesity and high BMI scores (256-258). Similarly Corinna and colleagues found on their study that PSQI scores and their components are not significantly associated with obesity status and BMI levels (256,259-261).

There was no statistically significant relationship was found between sleep quality and breakfast skipping (p>0,05). Stein and friends, Cheng and colleagues found that on their study that poor sleep quality significantly associated with breakfast skipping (262,263).

Hung and colleagues found that on their study that poor sleep quality and being overweight or being obese status are independently related after controlling for age, sex, sleep period, smoking, physical activity, hypertension, diabetes, lipit status, eGFR, and ALT (261).

There was no statistically significant relationship was found between sleep quality and waist circumference (p>0,05). Jennings and colleagues investigated some components that could pose a risk for the metabolic syndrome such as WC, BMI, and percentage of body fat and they found that PSQI scores positively related with these metabolic syndrome components (264).
In a study conducted by Liu and colleagues among 3166 elementary school students,secondary school students unexpectedlyand high school students, reduced sleep duration was found to be associated with increased cardiometabolic risk, adiposity, hyperglycemia, insulin resistance and adverse unfavorable adipokine levels but these associations differ by age. It was also found that the duration of short sleep was related to obesity in children and adolescents (265).

Liu and colleagues have found no relationship between sleep quality and BMI. SimilarlyKim and Cronlein have found no significant relationship between sleep quality and BMI in their studies. Significance of studies may vary depending on many factors. For example, some risk factors are not included in this study such as smoking status, alcohol consumption, physical activity, and tea consumption. The types of samples included in the studies conducted may also differ in terms of significance (266-268).

In this study, the participants' average BMI was found to be 20.26 kg / m2.A statistically significant difference was observed between the classes of the students BMI scores($p<0,05$). According to all pairwise multiple comparison test there was a statistically significant difference between the BMI scores of the 2 nd and 3 rd class students and there was no statistically significant difference between the BMI scores of the other classes was observed. This might be about participants nutrition knowledge. In the Nutrition and Dietetics section, the fact that the third year courses were more severe than the second year courses in terms of nutrition information may have contributed to the participants' eating habits and attitude towards weight, BMI, WC values. Informing individuals about nutrition will be effective in weight control and will prevent weight gain and achieve ideal BMI levels.

In a study conducted by Johansson and colleagues, it was found that participants with adequate sleep and inadequate sleep duration were compared and insufficiently sleeping were more significantly associated with daytime insomnia than the other participants($p<0.05$) (269). Although individuals with a low daily sleeping period say they sleep more none-routinely than individuals with a high daily sleeping period there was no significant relationship in this study between sleep duration and non-routine sleep. ($p>0,05$).(11)
This might be about participants profile. The increase in the number of participants, the change in the men-womenprofile participating in the study, and the fact that the study is carried out on a group other than university students may produce different results in future studies.

Eating habits and frequency of skipping meals are important factors on weight control and healthy lifestyle. Together with the conditions and responsibilities of the modern age, individuals acquire the wrong eating habits and skip meals.

Meals skipped due to various reasons lead individuals to wrong nutritional preferences and can lead to weight gain. In this study, 76.0% of participants stated that they had missed meals, while 24.0% stated that they did not miss meals. 43.5% of the participants stated they skipped breakfast meal, 39.0% expressed that they skipped mid-morning meals, 25.3% indicated they skipped lunch meals, 25.3% stated they skipped afternoon meals, 5.8% expressed they skipped dinner meals and 14.8% indicated they skipped night meals. In our study, breakfast was found as the most skipped meals.

In the study conducted by Monma and his colleagues among 906 university students, it was found that breakfast was the most skipped meal according to Monma and his colleagues(270).Yılmaz and Ozkan conducted a study among 175 university students and as a result of answers breakfast meal was found most skipped meal (271).In a study conducted by Vassigh's among 100 university students, 74.7% of the students stated that they had skipped meals, while 25.3% stated that they did not skip meals andas a result of the answers lunch meal was found most skipped meal (272).

In this study, there was an unexpectedly significant relationship found between meal skipping and status of living with family and living with friends at home compared to other options. ($p < 0,05$). Since the dormitories have certain meal times and meal menus, the rate of meal skipping of who stay in the dormitories may be lower than the other students. In the same way that the students who live alone and self-preparing their meals may have get used to certain layout and because of this the rate of skipping meals may be lower than to other students.

Attempts by individuals to do not skip any meal, especially the breakfast meal, will have a more positive effect on weight control and therefore BMI, WC values. Avoiding the habit of skipping meals prevents individuals from unhealthy food preferences. In this way consumption of simple sugar, fat and high calorie foods may be reduced.

6.CONCLUSION

Sleep quality and breakfast habits affect individuals mentally, socially and emotionally throughout the day. Even tough individuals are not aware of the sleep quality and breakfast habits these two factors associated with obesity and other diseases such as insulin resistance, diabetes, hypertension, cardiovascular diseases and cancer.

Various interventions to improve sleep quality and breakfast habits will reduce the risk of obesity and many diseases.

The limitation of our study was the limited sample size and additionally sample distribution that was completely from women nutrition and dietetics students who are studying in Yeditepe University and the sample size between the groups of waist circumferences were not comparable (n=8 vs n=129). In addition, a comparison of more than one departments may lead to different results.

7. REFERENCES

1: The National Institute of Diabetes and Digestive and Kidney Diseases Health. Available at: https://www.niddk.nih.gov/health-information/weight-management. December, 2017

2: Satman I, Alagöl F, Ömer B, et al. Türkiye diyabet, hipertansiyon, obezite ve endokrinolojik hastalıklar prevalans çalışması-II. *TURDEP II: Ön sonuçlar. Kronik hastalıklar oturumu*. 2010; *13*, 18-22.

3: Reutrakul S, Van Cauter E. Sleep influences on obesity, insulin resistance, and risk of type 2 diabetes. *Metabolism*. 2018.

4: Cappuccio F. P, Taggart F. M, Kandala N. B, et al. Meta-analysis of short sleep duration and obesity in children and adults. *Sleep*. 2008; *31*(5), 619-626

5: Anothaisintawee T, Reutrakul S, Van Cauter E, et al. Sleep disturbances compared to traditional risk factors for diabetes development: systematic review and meta-analysis. *Sleep medicine reviews*. 2016; *30*, 11-24.

6: Whitaker B. N, Fisher P. L, Jambhekar S, et al. Impact of degree of obesity on sleep, quality of life, and depression in youth. *Journal of Pediatric Health Care*. 2018; *32*(2), e37-e44.

7: Chuang J, Fehr K. K, Ievers-Landis C. E, et al. Associations of sleep duration and regularity with level of obesity among youth in a weight loss program. *Translational Issues in Psychological Science*. 2015; *1*(1), 45.

8: Reeves S, Huber J. W, Halsey L. G, et al. Experimental manipulation of breakfast in normal and overweight/obese participants is associated with changes to nutrient and energy intake consumption patterns. *Physiology & behavior*. 2014; *133*, 130-135.

9: De la Hunty A, Ashwell M. Are people who regularly eat breakfast cereals slimmer than those who don't? A systematic review of the evidence. *Nutrition Bulletin*. 2007; *32*(2), 118-128

10: De la Hunty, A, Gibson S, Ashwell M. Are children and adolescents who eat breakfast cereals slimmer than those who don't. *A systematic review and meta-analysis (in preparation)*. 2013.

11: Garvey W. T, Mechanick J. I, Einhorn D. The American Association of Clinical Endocrinologists and the American College of Endocrinology: 2014 Advanced Framework For a New Diagnosis Of Obesity As a Chronic Disease. *Endocrine practice: official journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists*. 2014; *20*(9), 977.

12: Guerrios-Rivera L, Howard L, Frank J, et al. Is Body Mass Index the Best Adiposity Measure for Prostate Cancer Risk? Results From a Veterans Affairs Biopsy Cohort. *Urology*. 2017; *105*, 129-135.

13: Kyle U. G, Genton L, Pichard, C. Body composition: what's new?. *Current Opinion in Clinical Nutrition & Metabolic Care*. 2002; *5*(4), 427-433

14: World Health Organization. Obesity and Overweight. Available at : http://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight. January, 2018.

15: Ryder J. R, Kaizer A. M, Rudser K. D, et al. Utility of Body Mass Index in Identifying Excess Adiposity in Youth Across the Obesity Spectrum. *The Journal of pediatrics*. 2016; *177*, 255-261.

16: Prentice A. M, Jebb S. A. Beyond body mass index. *Obesity reviews*. 2001; *2*(3), 141-147.

17: Pi-SunyerF. X, Becker D. M, Bouchard C, et al. NHLBI in cooperation with The National Institute of Diabetes and Digestive and Kidney Diseases Obesity Education Initiative Expert Panel on the Identification. Evaluation, and Treatment of Overweight and Obesity in Adults, 1998. United States of America

18: Mbanya V. N, Kengne A. P, Mbanya J. C, et al. Body mass index, waist circumference, hip circumference, waist–hip-ratio and waist–height-ratio: Which is the better discriminator of prevalent screen-detected diabetes in a Cameroonian population. *Diabetes research and clinical practice*. 2015; *108*(1), 23-30.

19: Czernichow S, Kengne A. P, Stamatakis E, et al. Body mass index, waist circumference and waist–hip ratio: which is the better discriminator of cardiovascular disease mortality risk? Evidence from an individual-participant meta-analysis of 82 864 participants from nine cohort studies. *Obesity reviews*. 2011; *12*(9), 680-687.

20: Cheong K. C, Ghazali S. M, Hock L. K, et al. The discriminative ability of waist circumference, body mass index and waist-to-hip ratio in identifying metabolic syndrome: Variations by age, sex and race. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. 2015; *9*(2), 74-78.5

21: Klein S, Allison D. B, Heymsfield S. B, et al. Waist circumference and cardiometabolic risk: a consensus statement from shaping America's health: Association for Weight Management and Obesity Prevention; NAASO, the Obesity Society; the American Society for Nutrition and the American Diabetes Association. *Obesity*. 2007; *15*(5), 1061-1067.

22: Baysal A, Aksoy M, Bozkurt N, et al. Diyet el kitabı. *Hatipoğlu Yayınevi*: Ankara. 2013; pp 40.

23: World Health Organization expert consultation, et al. Waist circumference and waist-hip ratio: report of a WHO expert consultation 8-11 December 2008. 2011. Geneva, Switzerland.

24: World Health Organization. Regional Office for Europe- Body mass index. Available at: http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi. December, 2017.

25: Cai M, Zou Z. Effect of aerobic exercise on blood lipid and glucose in obese or overweight adults: a meta-analysis of randomised controlled trials. *Obesity research & clinical practice*. 2016. *10*(5), 589-602.

26: Lissner L, Sohlström A, Sundblom E, et al. Trends in overweight and obesity in Swedish schoolchildren 1999–2005: has the epidemic reached a plateau?. *Obesity reviews*. 2010; *11*(8), 553-559.

27: Bhurosy, T. and Jeewon, R. Overweight and obesity epidemic in developing countries: a problem with diet, physical activity, or socioeconomic status?. *The Scientific World Journal*. *2014*.a

28: Ji C. Y, Cheng T. O. Epidemic increase in overweight and obesity in Chinese children from 1985 to 2005. 2009.

29: Hales C. M, Carroll M. D, Fryar C. D, et al. *Prevalence of obesity among adults and youth: United States, 2015-2016*. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, 2017.

30: Cha E, Crowe J. M, Braxter B. J, et al. Understanding How Overweight and Obese Emerging Adults Make Lifestyle Choices. *Journal of pediatric nursing*. 2016; *31*(6), e325-e332.

31: Bayon V, Leger D, Gomez-Merino D, et al. Sleep debt and obesity. *Annals of medicine*. 2014; *46*(5), 264-272

32: Rosenberg J, Maximov I. I, Reske M, et al. "Early to bed, early to rise": diffusion tensor imaging identifies chronotype-specificity. *NeuroImage*. 2014; *84*, 428-434.

33: Schoenborn C. A, Adams P. F. Sleep duration as a correlate of smoking, alcohol use, leisure-time physical inactivity, and obesity among adults: United States, 2004-2006. *Book Sleep duration as a correlate of smoking, alcohol use, leisure-time physical inactivity, and obesity among adults: United States, 2004-2006*. 2008.

34: MacLeod S. F, Terada T, Chahal B. S, et al. Exercise lowers postprandial glucose but not fasting glucose in type 2 diabetes: a meta-analysis of studies using continuous glucose monitoring. *Diabetes/metabolism research and reviews*. 2013; *29*(8), 593-603.

35: Morselli L, Leproult R, Balbo M, et al. Role of sleep duration in the regulation of glucose metabolism and appetite. *Best practice & research Clinical endocrinology & metabolism*. 2010; *24*(5), 687-702.

36: Jackson, C. L. Determinants of racial/ethnic disparities in disordered sleep and obesity. *Sleep Health: Journal of the National Sleep Foundation*. 2017; *3*(5), 401-415

37: Buxton O. M, Marcelli E. Short and long sleep are positively associated with obesity, diabetes, hypertension, and cardiovascular disease among adults in the United States. *Social science & medicine*. 2010; *71*(5), 1027-1036.

38: Doo M, Kim Y. Association between sleep duration and obesity is modified by dietary macronutrients intake in Korean. *Obesity research & clinical practice*. 2016; *10*(4), 424-431

39: Xiao Q, Arem H, Moore S. C, et al. A large prospective investigation of sleep duration, weight change, and obesity in the NIH-AARP Diet and Health Study cohort. *American journal of epidemiology*. 2013; *178*(11), 1600-1610

40: Patel S. R, Hu F. B. Short sleep duration and weight gain: a systematic review. *Obesity*. 2008; *16*(3), 643-653

41: Knutson K. L. Sleep duration and cardiometabolic risk: a review of the epidemiologic evidence. *Best practice & research Clinical endocrinology & metabolism*. 2010; *24*(5), 731-743

42: Chaput J. P, McNeil J, Després J. P, et al. Short sleep duration as a risk factor for the development of the metabolic syndrome in adults. *Preventive medicine*. 2013; *57*(6), 872-877.

43: Knutson K. L, Van Cauter E, Rathouz P. J, et al. Association between sleep and blood pressure in midlife: the CARDIA sleep study. *Archives of internal medicine*. 2009; *169*(11), 1055-1061.

44: Brondel L, Romer M. A, Nougues P. M, et al. Acute partial sleep deprivation increases food intake in healthy men–. *The American journal of clinical nutrition*. 2010; *91*(6), 1550-1559

45: St-Onge M. P. The role of sleep duration in the regulation of energy balance: effects on energy intakes and expenditure. *Journal of Clinical Sleep Medicine*. 2013; *9*(01), 73-80.

46: Schmid S. M, Hallschmid M, Jauch-Chara K. A. M. I. L. A, et al. A single night of sleep deprivation increases ghrelin levels and feelings of hunger in normal-weight healthy men. *Journal of sleep research*. 2008; *17*(3), 331-334.

47: Pejovic S, Vgontza, A. N, Basta M, et al. Leptin and hunger levels in young healthy adults after one night of sleep loss. *Journal of sleep research*. 2010; *19*(4), 552-558.

48: Schmid S. M, Hallschmid M, Jauch-Chara K, et al. Short-term sleep loss decreases physical activity under free-living conditions but does not increase food intake under time-deprived laboratory conditions in healthy men–. *The American journal of clinical nutrition*. 2009; *90*(6), 1476-1482.

49: Al-Kandari S, Alsalem A, Al-Mutairi S, et al. Association between sleep hygiene awareness and practice with sleep quality among Kuwait University students. *Sleep Health: Journal of the National Sleep Foundation*. 2017; *3*(5), 342-347

50: Buysse D. J, Reynolds C. F, Monk T. H, et al. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry research*. 1989; *28*(2), 193-213

51: Lacks P, Rotert M. Knowledge and practice of sleep hygiene techniques in insomniacs and good sleepers. *Behaviour research and therapy*. 1986; *24*(3), 365-368.

52: Perlis M. L, Aloia M, Kuhn B. *Behavioral treatments for sleep disorders: A comprehensive primer of behavioral sleep medicine interventions*. Academic Press. 2010.

53: Becker N. B, de Jesus S. N, Viseu J. N, et al. Depression and quality of life in older adults: Mediation effect of sleep quality. *International Journal of Clinical and Health Psychology*. 2017.

54: Gottlieb D. J, Punjabi N. M, Newman A. B, et al. Association of sleep time with diabetes mellitus and impaired glucose tolerance. *Archives of internal medicine*. 2005; *165*(8), 863-867.

55: Quevedo-Blasco R, Zych I, Buela-Casal G. Sleep apnea through journal articles included in the Web of Science in the first decade of the 21st century. *Revista iberoamericana de Psicología y Salud*. 2014; *5*(1).

56: World Association of Sleep Medicine. Available at: http://worldsleepday.org/press-releases. ;December, 2017

57: Kahn M, Sheppes G, Sadeh A. Sleep and emotions: bidirectional links and underlying mechanisms. *International Journal of Psychophysiology*. 2013; *89*(2), 218-228.

58: Dinges D. F. The state of sleep deprivation: from functional biology to functional consequences. *Sleep medicine reviews*. 2006; *10*(5), 303-305.

59: Babson K. A, Trainor C. D, Feldner M. T, et al. A test of the effects of acute sleep deprivation on general and specific self-reported anxiety and depressive symptoms: an experimental extension. *Journal of behavior therapy and experimental psychiatry*. 2010; *41*(3), 297-303.

60: Berry D. T, Webb W. B. State measures and sleep stages. *Psychological reports*. 1983; *52*(3), 807-812

61: Norlander T, Johansson Å, Bood S. Å. The affective personality: Its relation to quality of sleep, well-being and stress. *Social Behavior and Personality: an international journal*. 2005; *33*(7), 709-722

62: Scott B. A, Judge T. A. Insomnia, emotions, and job satisfaction: A multilevel study. *Journal of Management*. 2006; *32*(5), 622-645.

63: Aslam M, Siddiqui A. A, Sandeep G, et al. High prevalence of obesity among nursing personnel working in tertiary care hospital. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. 2017.

64: Renehan A. G, Tyson M, Egger M, Heller R. F, et al. Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. *The Lancet*. 2008; *371*(9612), 569-578.

65: Kotsis V, Stabouli S, Bouldin M, et al. Impact of obesity on 24-hour ambulatory blood pressure and hypertension. *Hypertension*. 2005; *45*(4), 602-607.

66: Stabouli S, Kotsis V, Papamichael C, et al. Adolescent obesity is associated with high ambulatory blood pressure and increased carotid intimal-medial thickness. *The Journal of pediatrics*. 2005; *147*(5), 651-656.

67: Chan J. M, Rimm E. B, Colditz G. A, et al. Obesity, fat distribution, and weight gain as risk factors for clinical diabetes in men. *Diabetes care*. 1994; *17*(9), 961-969.

68: Zalesin K. C, Franklin B. A, Miller W. M, et al. Impact of obesity on cardiovascular disease. *Medical Clinics of North America*. 2011; *95*(5), 919-937.

69: Calle E. E, Rodriguez C, Walker-Thurmond K, et al. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of US adults. *N Engl j Med*. *2003;* (348), 1625-1638.

70: Corsenac P, Annesi-Maesano I, Hoy D, et al. Overweight and obesity in New Caledonian adults: Results from measured and adjusted self-reported anthropometric data. *Diabetes research and clinical practice*. 2017; *133*, 193-203.

71: Linhart C, Tivollier J. M, Taylor R, et al. Changes in cardiovascular disease risk factors over 30 years in Polynesians in the French Pacific Territory of Wallis Island. *European journal of preventive cardiology*. 2016; *23*(8), 856-864.

72: Wenger N. K. Prevention of cardiovascular disease: highlights for the clinician of the 2013 American College of Cardiology/American Heart Association guidelines. *Clinical cardiology*. 2014; *37*(4), 239-251.

73: Hall J. E, do Carmo J. M, da Silva, A. A, et al. Obesity-induced hypertension: interaction of neurohumoral and renal mechanisms. *Circulation research*. 2015; *116*(6), 991-1006.

74: Gallagher E. J, LeRoith D. Obesity and diabetes: the increased risk of cancer and cancer-related mortality. *Physiological reviews*. 2015; *95*(3), 727-748

75: Puhl R. M, King K. M. Weight discrimination and bullying. *Best practice & research Clinical endocrinology & metabolism*. 2013; *27*(2), 117-127.

76: Taylor V. H, Forhan M, Vigod S. N, et al. The impact of obesity on quality of life. *Best practice & research Clinical endocrinology & metabolism*. 2013; *27*(2), 139-146

77: Daïen C. I, Sellam J. Obesity and inflammatory arthritis: impact on occurrence, disease characteristics and therapeutic response. *RMD open*. 2015; *1*(1), e000012.

78: Raziel A, Sakran N, Szold A. Current solutions for obesity-related liver disorders: non-alcoholic fatty liver disease and non-alcoholic steatohepatitis. *The Israel Medical Association journal: IMAJ*. 2015; *17*(4), 234.

79: Karatzi K, Moschonis G, Polychronopoulou M. C, et al. Cutoff points of waist circumference and trunk and visceral fat for identifying children with elevated inflammation markers and adipokines: The Healthy Growth Study. *Nutrition*. 2016; *32*(10), 1063-1067

80: Otero M, Lago R, Lago F, et al. Leptin, from fat to inflammation: old questions and new insights. FEBS Lett, 2005; 579:295–301.

81: Ford E.S, Galuska D.A, Gillespie C, et al. C-reactive protein and body mass index in children: findings from the Third National Health and Nutrition Examination Survey, 1988–1994. J Pediatr, 2001; 138:486–92

82: Turer A.T, Scherer P.E. Adiponectin: mechanistic insights and clinical implications. *Diabetologia*. 2012; 55:2319–26

83: Mantzoros C.S, Moschos S, Avramopoulos I, et al. Leptin concentrations in relation to body mass index and the tumor necrosis factor-alpha system in humans. J Clin Endocrinol Metab. 1997; 82:3408–13

84: Corica F, Allegra A, Corsonello A, et al. Relationship between plasma leptin levels and the tumor necrosis factoralpha system in obese subjects. Int J Obes Relat Metab Disord. 1999; 23:355–60.

85: Sainz N, Barrenetxe J, Moreno-Aliaga MJ, et al. Leptin resistance and diet-induced obesity: central and peripheral actions of leptin. Metabolism. 2015; 64:35–46

86: Lee C.G, Carr M.C, Murdoch S.J, et al. Adipokines, inflammation, and visceral adiposity across the menopausal transition: a prospective study. J Clin Endocrinol Metab. 2009; 94:1104–10

87: Lopez-Jaramillo P, Gomez-Arbelaez D, Lopez-Lopez J, et al. The role of leptin/adiponectin ratio in metabolic syndrome and diabetes. *Horm Mol Biol Clin Investig.* 2014; 18:37–45

88: Akyol A, Bilgiç P, & Ersoy G. Fiziksel Aktivite, Beslenme ve Sağlıklı Yaşam. *Ankara: Klasmat Matbaacılık*; 2008.

89: Bailey-Davis L, Poulsen M. N, Hirsch A. G, et al. Home food rules in relation to youth eating behaviors, body mass index, waist circumference, and percent body fat. *Journal of Adolescent Health*. 2017; *60*(3), 270-276.

90: Spear B. A, Barlow S. E, Ervin C, et al. Recommendations for treatment of child and adolescent overweight and obesity. *Pediatrics*. 2007; *120*(Supplement 4), S254-S288.

91: Sweeting A. N, Hocking S. L, Markovic T. P. Pharmacotherapy for the treatment of obesity. *Molecular and cellular endocrinology*. 2015; *418*, 173-183.

92: Kral J. G, Näslund E. Surgical treatment of obesity. *Nature Reviews Endocrinology*. 2007; *3*(8), 574

93: Sjöström L, Narbro K, Sjöström C. D, et al. Effects of bariatric surgery on mortality in Swedish obese subjects. *New England journal of medicine*. 2007; *357*(8), 741-752.

94: Wimmelmann C. L, Dela F, Mortensen E. L. Psychological predictors of mental health and health-related quality of life after bariatric surgery: a review of the recent research. *Obesity research & clinical practice*. 2014; *8*(4), 314-324.

95: National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Food and Nutrition Board; Roundtable on Obesity Solutions, Olson S. *The Challenge of Treating Obesity and Overweight: Proceedings of a Workshop*. National Academies Press. 2017.

96: Terzioğlu E. *Başkent Üniversitesi İstanbul Hastanesi'nde çalışan 20-64 yaş arası yetişkin bireylerde şekerli ve tatlandırıcılı içecek tüketiminin enerji alımı ve obezite üzerine etkisi, İstanbul,* Başkent Üniversitesi Sağlık Bilimleri Enstitüsü, 2015.

97: Wadden T.A.B. R.I, Very low calorie diets, In: Fairburn CAB, Brownell KD, eds. *Eating disorders and obesity*. The Guilford Press. New York and London, 2002; 534-8.

98: Mustajoki P, Pekkarinen T. Very low energy diets in treatment of obesity. Obesity Review. 2001; 2:61-72

99: National Institutes of Health, Obesity Initiative, The Practical Guide: Identification, Evaluation and Treatment of Overweight and Obesity in Adults. Bethesda MD: NIH Pub. Number 00-4084, 2000

100: Mahan L. K, Raymond J. L, ed. *Krause's food & the nutrition care process-e-book*. 14 th ed. *Krause's food & the nutrition care process-e-book.* Elsevier Health Sciences: Philadelphia; 2016.

101: Trumbo P, Schlicker S, Yates A. A, et al. Dietary reference intakes for energy, carbohdrate, fiber, fat, fatty acids, cholesterol, protein and amino acids. *Journal of the Academy of Nutrition and Dietetics*. 2002; *102*(11), 1621.

102: Keller K, López S. R, Moreno M. M. C. Association between meal intake behaviour and abdominal obesity in Spanish adults. *Appetite*. 2015; *92*, 1-6.

103: Howarth N. C, Huang T. T, Roberts S. B, et al. Eating patterns and dietary composition in relation to BMI in younger and older adults. *International journal of obesity*. 2007; *31*(4), 675

104: Mesas A. E, Muñoz-Pareja M, López-García E, et al. Selected eating behaviours and excess body weight: a systematic review. *Obesity Reviews*. 2012; *13*(2), 106-135

105: Alencar M. K, Beam J. R, McCormick J. J, et al. Increased meal frequency attenuates fat-free mass losses and some markers of health status with a portion-controlled weight loss diet. *Nutrition Research*. 2015; *35*(5), 375-383.

106: Kong A, Beresford S. A, Alfano C. M, et al. Self-monitoring and eating-related behaviors are associated with 12-month weight loss in postmenopausal overweight-to-obese women. *Journal of the Academy of Nutrition and Dietetics*. 2012; *112*(9), 1428-1435.

107: Garrow J. S, Durrant M, Blaza S, et al. The effect of meal frequency and protein concentration on the composition of the weight lost by obese subjects. *British Journal of Nutrition*. 1981; *45*(1), 5-15

108: Zizza C. A, Xu B. Snacking is associated with overall diet quality among adults. *Journal of the Academy of Nutrition and Dietetics*. 2012; *112*(2), 291-296.

109: Kulovitz M. G, Kravitz L. R, Mermier C, et al. Potential role of meal frequency as a strategy for weight loss and health in overweight or obese adults. *Nutrition*. 2014; *30*(4), 386-392.

110: Baum J. I, Gaines B. L, Kubas G. C, et al. Educational nutrition messaging at breakfast reduces snack intake and influences snack preferences in adult men and women. *Appetite*. 2017.

111: Bandyopadhyay D, Ashish K, Hajra A, et al. An interesting insight into breakfast and cardiovascular disease. *International journal of cardiology*. 2017.

112: Witbracht M, Keim N. L, Forester S, et al. Female breakfast skippers display a disrupted cortisol rhythm and elevated blood pressure. *Physiology & behavior*. 2015; *140*, 215-221.

113: Ahadi Z, Qorbani M, Kelishadi R, et al. Association between breakfast intake with anthropometric measurements, blood pressure and food consumption behaviors among Iranian children and adolescents: the CASPIAN-IV study. *Public health*. 2015; *129*(6), 740-747.

114: Cho S, Dietrich M, Brown C. J, et al. The effect of breakfast type on total daily energy intake and body mass index: results from the Third National Health and Nutrition Examination Survey (NHANES III). *Journal of the American College of Nutrition*. 2003; *22*(4), 296-302.

115: Alexander K. E, Ventura E. E, Spruijt-Metz D, et al. Association of breakfast skipping with visceral fat and insulin indices in overweight Latino youth. *Obesity*. 2009; *17*(8), 1528-1533

116: Dubois L, Girard M, Kent M. P. Breakfast eating and overweight in a pre-school population: is there a link? . *Public health nutrition*. 2006; *9*(4), 436-442

117: Fiore H, Travis S, Whalen A, et al. Potentially protective factors associated with healthful body mass index in adolescents with obese and nonobese parents: a secondary data analysis of the third national health and nutrition examination survey, 1988-1994. *Journal of the American Dietetic Association*. 2006; *106*(1), 55-64.

118: Di Giuseppe R, Di Castelnuovo A, Melegari C, et al. Typical breakfast food consumption and risk factors for cardiovascular disease in a large sample of Italian adults. *Nutrition, Metabolism and Cardiovascular Diseases*. 2012; *22*(4), 347-354..

119: Howarth N. C, Saltzman E, Roberts S. B. Dietary fiber and weight regulation. *Nutrition reviews*. 2001; *59*(5), 129-139

120: Slavin J. L. Dietary fiber and body weight. *Nutrition*. 2005; *21*(3), 411-418

121: Mcintosh M, Miller C. A diet containing food rich in soluble and insoluble fiber improves glycemic control and reduces hyperlipidemia among patients with type 2 diabetes mellitus. *Nutrition Reviews*. 2001; *59*(2), 52-55

122: Azadbakht L, Haghighatdoost F, Feizi A, et al. Breakfast eating pattern and its association with dietary quality indices and anthropometric measurements in young women in Isfahan. *Nutrition*. 2013; *29*(2), 420-425.

123: Smith K. J, Gall S. L, McNaughton S. A, et al. Skipping breakfast: longitudinal associations with cardiometabolic risk factors in the Childhood Determinants of Adult Health Study. *The American journal of clinical nutrition*. 2010; *92*(6), 1316-1325.

124: Pereira M. A, Erickson E, McKee P, et al. Breakfast Frequency and Quality May Affect Glycemia and Appetite in Adults and Children–4. *The Journal of nutrition*. 2010; *141*(1), 163-168.

125: Sjöberg A, Hallberg L, Höglund D, et al. Meal pattern, food choice, nutrient intake and lifestyle factors in The Göteborg Adolescence Study. *European journal of clinical nutrition*. 2003; *57*(12), 1569-1578.

126: Reeves S, Halsey L. G, McMeel Y, et al. Breakfast habits, beliefs and measures of health and wellbeing in a nationally representative UK sample. *Appetite*. 2013; *60*, 51-57.

127: Ingwersen J, Defeyter M. A, Kennedy D. O, et al. A low glycaemic index breakfast cereal preferentially prevents children's cognitive performance from declining throughout the morning. *Appetite*. 2007 *49*(1), 240-244

128: O'Neil C. E, Byrd-Bredbenner C, Hayes D, et al. The role of breakfast in health: definition and criteria for a quality breakfast. *Journal of the Academy of Nutrition and Dietetics*. 2014; *114*(12), S8-S26.

129: Bayham B. E, Greenway F. L, Johnson W. D, et al. A randomized trial to manipulate the quality instead of quantity of dietary proteins to influence the markers of satiety. *Journal of Diabetes and its Complications*. 2014; *28*(4), 547-552.

130: Tolfrey K, Zakrzewski J. K. Breakfast, glycaemic index and health in young people. *Journal of Sport and Health Science*. 2012; *1*(3), 149-159.

131: Smith K. J, Gall S. L, McNaughton S. A, et al. Skipping breakfast: longitudinal associations with cardiometabolic risk factors in the Childhood Determinants of Adult Health Study. *The American journal of clinical nutrition*. 2010; *92*(6), 1316-1325.

132: Ratliff J, Leite J. O, de Ogburn R, et al. Consuming eggs for breakfast influences plasma glucose and ghrelin, while reducing energy intake during the next 24 hours in adult men. *Nutrition Research*. 2010; *30*(2), 96-103.

133: Lee S. W. H, Ng K. Y, Chin W. K. The impact of sleep amount and sleep quality on glycemic control in type 2 diabetes: a systematic review and meta-analysis. *Sleep medicine reviews*. 2017; *31*, 91-101.

134: Timmermans M, Mackenbach J. D, Charreire H, et al. Exploring the mediating role of energy balance-related behaviours in the association between sleep duration and obesity in European adults. The SPOTLIGHT project. *Preventive medicine*. 2017; *100*, 25-32.

135: Magee L, Hale L. Longitudinal associations between sleep duration and subsequent weight gain: a systematic review. *Sleep medicine reviews*. 2012; *16*(3), 231-241.

136: Magee C. A, Iverson D. C, Huang X. F, et al. A link between chronic sleep restriction and obesity: methodological considerations. *Public health*. 2008; *122*(12), 1373-1381.

137: Chaput J. P. Sleep patterns, diet quality and energy balance. *Physiology & behavior*. 2014; *134*, 86-91.

138: Patterson R. E, Emond J. A, Natarajan L, et al. Short Sleep Duration Is Associated with Higher Energy Intake and Expenditure among African-American and Non-Hispanic White Adults, 2. *The Journal of nutrition*. 2014; *144*(4), 461-466.

139: Atkinson G, Davenne D. Relationships between sleep, physical activity and human health. *Physiology & behavior*. 2007 *90*(2-3), 229-235.

140: Edwards M. K., Loprinzi P. D. Experimentally increasing sedentary behavior results in decreased sleep quality among young adults. *Mental Health and Physical Activity*. 2017; *12*, 132-140.

141: Tsuno N, Besset A, Ritchie K. Sleep and depression. *The Journal of clinical psychiatry*. 2005.

142: Altevogt B. M, Colten H. R. *Sleep disorders and sleep deprivation: an unmet public health problem*. *National Academies Press*. 2006.

143: Alhola P, Polo-Kantola P. Sleep deprivation: Impact on cognitive performance. *Neuropsychiatric disease and treatment*. 2007.

144: Dweck J. S, Jenkins S. M, Nolan L. J. The role of emotional eating and stress in the influence of short sleep on food consumption. *Appetite*. 2014; *72*, 106-113.

145: Garaulet M, Ortega F. B, Ruiz J. R, et al. Short sleep duration is associated with increased obesity markers in European adolescents: effect of physical activity and dietary habits. The HELENA study. *International journal of obesity*. 2011; *35*(10), 1308.

146: Stamatakis K. A, Brownson R. C. Sleep duration and obesity-related risk factors in the rural Midwest. *Preventive medicine*. 2008; *46*(5), 439-444.

147: Westerlund L, Ray C, Roos E. Associations between sleeping habits and food consumption patterns among 10–11-year-old children in Finland. *British Journal of Nutrition*. 2009; *102*(10), 1531-1537.

148: Weiss A, Xu F, Storfer-Isser A, et al. The association of sleep duration with adolescents' fat and carbohydrate consumption. *Sleep*. 2010; *33*(9), 1201-1209.

149: Mezick E. J, Wing R. R, McCaffery J. M. Associations of self-reported and actigraphy-assessed sleep characteristics with body mass index and waist circumference in adults: moderation by gender. *Sleep medicine*. 2014. *15*(1), 64-70.

150: Cappuccio F. P, Taggart F. M, Kandala N. B, et al. Meta-analysis of short sleep duration and obesity in children and adults. *Sleep*. 2008; *31*(5), 619-626.

151: Günaydın N. The quality of sleep and effects on general mental health of nurses who works in a state hospital. *Journal of Psychiatric Nursing/Psikiyatri Hemsireleri Dernegi*. 2014; *5*(1).

152: Sönmez S. Vardiyalı çalışan hemşirelerde horlama, uyku bozuklukları ve iş kazaları. Bursa, Uludağ Üniversitesi Tıp Fakültesi Göğüs Hastalıkları ABD, 2006.

153: Üstün Y, Yücel Ş. Ç. Hemşirelerin uyku kalitesinin incelenmesi. *Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi*. 2011; *4*(1), 29-38.

154: Engin E. Ege Üniversitesi Tıp Fakültesi Hastanesi Yoğun Bakım Hemşirelerinin Uyku Düzen Özellikleri İle İş Doyumu Arasındaki İlişkinin İncelenmesi.*İzmir, Ege Üniversitesi Sağlık Bilimleri Enstitüsü, Yüksek Lisans Tezi*.1999.

155: Pagan R. Sleep duration, life satisfaction and disability. *Disability and health journal*. 2017; *10*(2), 334-343.

156: Biddle J, Hamermesh D. Sleep and The Allocation of Time. *J Political Econ*. 1990; 98(5): 922e943.

157: Asgeirsdottir T. L, Zoega G. On The Economics of Sleeping. *Mind & Society*. 2011; *10*(2), 149-154.

158: Aeschbach D, Sher L, Postolache T. T, et al. A longer biological night in long sleepers than in short sleepers. *The Journal of Clinical Endocrinology & Metabolism*. 2003; *88*(1), 26-30.

159: Van Dongen H. P, Vitellaro K. M, Dinges D. F. Individual differences in adult human sleep and wakefulness: Leitmotif for a research agenda. *Sleep*. 2005; *28*(4), 479-496.

160: Hoyos C, Glozier N, Marshall N. S. Recent evidence on worldwide trends on sleep duration. *Current Sleep Medicine Reports*. 2015; *1*(4), 195-204.

161: Ancoli-Israel S. Sleep and aging: prevalence of disturbed sleep and treatment considerations in older adults. *The Journal of clinical psychiatry*. 2005; *66*, 24-30.

162: National Sleep Foundation. Available at: https://www.sleepfoundation.org. January; 2018.

163: Hogenkamp P. S, Nilsson E, Nilsson V. C, et al. Acute sleep deprivation increases portion size and affects food choice in young men. *Psychoneuroendocrinology*. 2013; *38*(9), 1668-1674

164: Brondel L, Romer M. A, Nougues P. M, et al. Acute partial sleep deprivation increases food intake in healthy men–. *The American journal of clinical nutrition*. 2010; *91*(6), 1550-1559.

165: Taheri S, Lin L, Austin D, et al. Short sleep duration is associated with reduced leptin, elevated ghrelin, and increased body mass index. *PLoS medicine*. 2004; *1*(3), 62.

166: Bosy-Westphal A, Hinrichs S, Jauch-Chara K, et al. Influence of partial sleep deprivation on energy balance and insulin sensitivity in healthy women. *Obesity facts*. 2008; *1*(5), 266-273.

167: Nedeltcheva A.V, Kilkus J.M, Imperial J, et al. Sleep curtailment is accompanied by increased intake of calories from snacks. *Am. J. Clin. Nutr*. 2009; 89, 126—133.

168: St-Onge M.-P, Roberts A.L, Chen J, et al. Short sleep duration increases energy intakes but does not change energy expenditure in normal-weight individuals. *Am. J. Clin. Nutr*. 2011; 94, 410—416

169: Spiegel K, Tasali E, Penev, P., Cauter, E.V., 2004. Brief communication: sleep curtailment in healthy young men is associated with decreased leptin levels, elevated ghrelin levels, and increased hunger and appetite. *Ann. Int. Med.* 141, 846—850.

170: Nedeltcheva A.V, Kilkus J.M, Imperial J, et al. Insufficientsleep undermines dietary effortsto reduce adiposity. *Ann. Int. Med.* 2010; 153, 435—441.

171: Benedict C, Hallschmid M, Lassen A, et al. Acute sleep deprivation reduces energy expenditure in healthy men. *Am. J. Clin. Nutr*. 2011; 93, 1229—1236.

172: Benedict C, Brooks S.J, O'Daly O.G, et al. Acute sleep deprivation enhances the brain's response to hedonic food stimuli: an fMRI study. *J. Clin. Endocrinol. Metab*. 2012; 97, 443—447

173: St-Onge M.P, McReynolds A, Trivedi Z.B, et al. Sleep restriction leads to increased activation of brain regions sensitive to food stimuli. *Am. J. Clin. Nutr*. 2012a; 95, 818— 824.

174: Akıncı E, Orhan F. Ö. Circadian Rhythm Sleep Disorders. *Psikiyatride Guncel Yaklasimlar-Current Approaches in Psychiatry*. 2016; *8*(2), 178-189.

175: Çalıyurt O. Duygudurum bozuklukları ve biyolojik ritm. *Duygudurum Dizisi*. 2001; *5*, 209-214.

176: Selvi Y, Özdemir P. G, Özdemir O, et al. Sağlık çalışanlarında vardiyalı çalışma sisteminin sebep olduğu genel ruhsal belirtiler ve yaşam kalitesi üzerine etkisi. *Düşünen Adam Psikiyatri ve Nörolojik Bilimler Dergisi*. 2010; *23*(4), 238-43.

177: Zee PC, Manthena P. The brain's master circadian clock: implications and opportunities for therapy of sleep disorders. *Sleep Med Rev.* 2007; 11:59-70.

178: Krishnan M, Shelling A. N, Wall C. R, et al. Gene-by-environment interactions of the CLOCK, PEMT, and GHRELIN loci with average sleep duration in relation to obesity traits using a cohort of 643 New Zealand European children. *Sleep medicine*. 2017; *37*, 19-26.

179: Karlsson B, Knutsson A, Lindahl B. Is there an association between shift work and having a metabolic syndrome? Results from a population based study of 27 485 people. *Occupational and environmental medicine*. 2001; *58*(11), 747-752.

180: Brum M. C. B, Dantas Filho F. F, Schnorr C. C, et al. Shift work and its association with metabolic disorders. *Diabetology & metabolic syndrome*. 2015; *7*(1), 45.

181: Miller A. L, Lumeng J. C, LeBourgeois M. K. Sleep patterns and obesity in childhood. *Current opinion in endocrinology, diabetes, and obesity*. 2015; *22*(1), 41.

182: Rudic R. D, McNamara P, Curtis A. M, et al. BMAL1 and CLOCK, two essential components of the circadian clock, are involved in glucose homeostasis. *PLoS biology*. 2004; *2*(11), e377.

183: Miller B. H, Olson S. L, Turek F. W, et al. Circadian clock mutation disrupts estrous cyclicity and maintenance of pregnancy. *Current Biology*. 2004; *14*(15), 1367-1373.

184: Schlierf G, & Dorow E. Diurnal patterns of triglycerides, free fatty acids, blood sugar, and insulin during carbohydrate-induction in man and their modification by nocturnal suppression of lipolysis. *Journal of Clinical Investigation*. 1973; *52*(3), 732.

185: Ye D, Cai S, Jiang X, et al. Associations of polymorphisms in circadian genes with abdominal obesity in Chinese adult population. *Obesity research & clinical practice*. 2016; *10*, S133-S141.

186: Garaulet M, Madrid J. A. Chronobiology, genetics and metabolic syndrome. *Current opinion in lipidology*. 2009; *20*(2), 127-134.

187: Ko C. H, Takahashi J. S. Molecular components of the mammalian circadian clock. *Human molecular genetics*. 2006; *15*(2), 271-277.

188: Summa K. C, Turek F. W. Chronobiology and obesity: interactions between circadian rhythms and energy regulation. *Advances in Nutrition: An International Review Journal*. 2014; *5*(3), 312-319.

189: Young M. W, Kay S. A. Time zones: a comparative genetics of circadian clocks. *Nature Reviews Genetics*. 2001; *2*(9), 702-715.

190: Garaulet M, Gómez-Abellán P, Madrid J. A. Chronobiology and obesity: the orchestra out of tune.*Clinical Lipidology*. 2010; *5*(2), 181-188.

191: Hansen S. N, Peics J, Gerhart-Hines Z. Keeping Fat on Time: Circadian Control of Adipose Tissue. *Experimental Cell Research*. 2017.

192: Balsalobre A, Brown S. A, Marcacci L, et al. Resetting of circadian time in peripheral tissues by glucocorticoid signaling. *Science*. 2000; *289*(5488), 2344-2347.

193: Buhr E. D, Yoo S. H, Takahashi J. S. Temperature as a universal resetting cue for mammalian circadian oscillators. *Science*. 2010; *330*(6002), 379-385.

194: Preitner N, Damiola F, Zakany J, et al. The orphan nuclear receptor REV-ERBα controls circadian transcription within the positive limb of the mammalian circadian oscillator. *Cell*. 2002; *110*(2), 251-260.

195: Selvi Y, Kandeğer A, Sayın A. A. Gündüz Aşırı Uykululuğu. *Psikiyatride Güncel Yaklaşımlar*. 2016; *8*(2), 114-132.

196: McCarley R. W, Chokroverty S. Neurophysiology of sleep: Basic mechanisms underlying control of wakefulness and sleep. *Sleep Disorders Medicine; Basic Science, Technical Considerations and Clinical Aspects*. 1994; 17-36.

197: De Jesus Cabeza R, Zoltoski R. K, Gillin J. C. Biochemical pharmacology of sleep. In *Sleep disorders medicine.1994;* 37-56.

198: Taşkıran N. Gebelerde Uyku Kalitesinin Değerlendirilmesi Doğum ve Kadın Hastalıkları Hemşireliği Anabilim Dalı Yüksek Lisans Tezi, Afyonkarahisar, *Afyon Kocatepe Üniversitesi. 2009.*

199: Bingöl N. Hemşirelerin Uyku Kalitesi, İş Doyumu Düzeyleri Arasındaki İlişkinin İncelenmesi. Yüksek Lisans Tezi, Sivas, Cumhuriyet Üniversitesi, 2006.

200: Kiper S. Romatoid Artritli Hastalarda Uyku Kalitesinin Değerlendirilmesi. Yüksek Lisans Tezi, Afyonkarahisar, Afyon Kocatepe Üniversitesi, 2008.

201: Ertekin Ş. Hastanede Yatan Hastalarda Uyku Kalitesinin Değerlendirilmesi. Yüksek Lisans tezi, Sivas, Cumhuriyet Üniversitesi, 1998.

202: Şahin L, Aşcioğlu M, Taşkin, E. Uyku ve uykunun düzenlenmesi. *Sağlık Bilimleri Dergisi*.2013; *22*(1), 93-98.

203: Pagel JF, Barnes BL. Medications for the treatment of sleep disorders: An overview. *J Clin Psych.* 2001; 3: 118–125.

204: What is sleep? . Available at: http:// www.sleephomepages.org/sleepsyllabus/ a.html. Accessed at: July; 2008.

205: Eryavuz N. Hemodiyaliz ve Periton Diyalizi Hastalarında Uyku Kalitesinin Karşılaştırılması. *Afyon Kocatepe Üniversitesi Sağlık Bilimleri Enstitüsü iç Hastalıkları Hemşireliği Anabilim Dalı Yüksek Lisans Tezi. Afyonkarahisar, Afyon Kocatepe Üniversitesi, 2007.*

206: Görgülü Ü. KOAH hastalarında uyku kalitesinin değerlendirilmesi. Yüksek Lisans Tezi, Ankara, *Hacettepe Üniversitesi,* 2003.

207: Aydın H, Yetkin S. Uyku: Yapısı ve İşlevleri. Kitap: Karakaş S, İrkeç C, İşeri E, et al. Kognitif Nörobilimler. Nobel Tıp Kitabevleri: Ankara. 2008; 282-299.

208: Leger D, Bayon V, de Sanctis A. The role of sleep in the regulation of body weight. *Molecular and Cellular Endocrinology*. 2015; *418*, 101-107.

209: Leproult R, Van Cauter E. Role of sleep and sleep loss in hormonal release and metabolism. In *Pediatric Neuroendocrinology. 2010;* 17,11-21.

210: Van Cauter E, Latta F, Nedeltcheva A, et al. Reciprocal interactions between the GH axis and sleep. *Growth hormone & IGF research*. 2004; *14*, 10-17.

211: Van Cauter E, Kerkhofs M, Caufriez A, et al. A quantitative estimation of growth hormone secretion in normal man: reproducibility and relation to sleep and time of day. *The Journal of Clinical Endocrinology & Metabolism*. 1992; *74*(6), 1441-1450.

212: Guyon A, Balbo M, Morselli L. L, et al. Adverse effects of two nights of sleep restriction on the hypothalamic-pituitary-adrenal axis in healthy men. *The Journal of Clinical Endocrinology & Metabolism*. 2014; *99*(8), 2861-2868.

213: Weitzman E. D, Zimmerman J. C, Czeisler C. A, et al. Cortisol secretion is inhibited during sleep in normal man. *The Journal of Clinical Endocrinology & Metabolism*. 1983; *56*(2), 352-358.

214: Friess E, Tagaya H, Grethe C, et al. Acute cortisol administration promotes sleep intensity in man. *Neuropsychopharmacology*. 2004; *29*(3), 598.

215: Allan J. S, Czeisler C. A. Persistence of the circadian thyrotropin rhythm under constant conditions and after light-induced shifts of circadian phase. *The Journal of Clinical Endocrinology & Metabolism*. 1994; *79*(2), 508-512.

216: Gronfier C, Brandenberger G. Ultradian rhythms in pituitary and adrenal hormones: their relations to sleep. *Sleep medicine reviews*. 1998; *2*(1), 17-29.

217: Öçal Ö. *Acıbadem Maslak Hastanesi beslenme ve diyet polikliniğine başvuran 20-64 yaş arası bireylerde besin tüketimi ile Pittsburgh Uyku Kalitesi arasındaki ilişkinin değerlendirilmesi. Ankara*, Başkent Üniversitesi Sağlık Bilimleri Enstitüsü, 2015.

218: Peuhkuri K, Sihvola N, Korpela R. Diet promotes sleep duration and quality. *Nutrition research*. 2012; *32*(5), 309-319.

219: Valtonen M. A. I. J. A, Niskanen L, Kangas A. P, et al. Effect of melatonin-rich night-time milk on sleep and activity in elderly institutionalized subjects. *Nordic journal of psychiatry*. 2005; *59*(3), 217-221.

220: Yamamura S, Morishima H, Kumano-Go T, et al. The effect of Lactobacillus helveticus fermented milk on sleep and health perception in elderly subjects. *European journal of clinical nutrition*. 2009; *63*(1), 100.

221: Pigeon W. R, Carr M, Gorman C, et al. Effects of a tart cherry juice beverage on the sleep of older adults with insomnia: a pilot study. *Journal of medicinal food*. 2010; *13*(3), 579-583.

222: Lin H. H, Tsai P. S, Fang S. C, et al. Effect of kiwifruit consumption on sleep quality in adults with sleep problems. *Asia Pacific journal of clinical nutrition*. 2011; *20*(2), 169-174.

223: España R. A, Scammell T. E. Sleep neurobiology from a clinical perspective. *Sleep*. 2011; *34*(7), 845-858.

224: Jones B. E. Neurobiology of waking and sleeping. In *Handbook of Clinical Neurolog. 2011;* 98,131-149.

225: Arnulf I, Quintin P, Alvarez J. C, et al. Mid-morning tryptophan depletion delays REM sleep onset in healthy subjects. *Neuropsychopharmacology*. 2002; *27*(5), 843-851.

226: Hartmann E. Effects of L-tryptophan on sleepiness and on sleep. *Journal of psychiatric research*. 1982;*17*(2),107-113.

227:Silber B. Y, Schmitt J. A. J. Effects of tryptophan loading on human cognition, mood, and sleep. *Neuroscience & Biobehavioral Reviews*. 2010; *34*(3), 387-407.

228: Al-Disi D, Al-Daghri N, Khanam L, et al. Subjective sleep duration and quality influence diet composition and circulating adipocytokines and ghrelin levels in teen-age girls. *Endocrine journal*. 2010; *57*(10), 915-923.

229: Weiss A, Xu F, Storfer-Isser A, et al. The association of sleep duration with adolescents' fat and carbohydrate consumption. *Sleep*. 2010; *33*(9), 1201-1209.

230: Shi Z, McEvoy M, Luu J, Attia J. Dietary fat and sleep duration in Chinese men and women. *International journal of obesity*. 2008; *32*(12), 1835.

231: Diethelm K, Remer T, Jilani H, et al. Associations between the macronutrient composition of the evening meal and average daily sleep duration in early childhood. *Clinical nutrition*. 2011; *30*(5), 640-646.

232: Afaghi A, O'connor H, Chow C. M. High-glycemic-index carbohydrate meals shorten sleep onset–. *The American journal of clinical nutrition*. 2007; *85*(2), 426-430.

233: Imaki M, Hatanaka Y, Ogawa Y, et al. An epidemiological study on relationship between the hours of sleep and life style factors in Japanese factory workers. *Journal of physiological anthropology and applied human science*. 2002; *21*(2), 115-120.

234: Grandner M. A, Kripke D. F, Naidoo N, et al. Relationships among dietary nutrients and subjective sleep, objective sleep, and napping in women. *Sleep medicine*. 2010; *11*(2), 180-184.

235: Rontoyanni V. G, Baic S, Cooper A. R. Association between nocturnal sleep duration, body fatness, and dietary intake in Greek women. *Nutrition*. 2007; *23*(11-12), 773-777.

236: Wells A. S, Read N. W, Uvnas-Moberg K, et al. Influences of fat and carbohydrate on postprandial sleepiness, mood, and hormones. *Physiology & behavior*. 1997; *61*(5), 679-686.

237: Phillips F, Crisp A. H, McGuinness B, et al. Isocaloric diet changes and electroencephalographic sleep. *The Lancet*. 1975; *306*(7938), 723-725.

238: Afaghi A, O'Connor H, Chow C. M. Acute effects of the very low carbohydrate diet on sleep indices. *Nutritional neuroscience*. 2008; *11*(4), 146-154.

239: Ay F, Ertem Ü, Özcan N, et al. Temel Hemsirelik. İstanbul Medikal Yayıncılık, İstanbul; 2007; 409-421

240: Çölbay M, Yüksel Ş, Fidan F, et al. Hemodiyaliz hastalarının Pittsburgh uyku kalite indeksi ile değerlendirilmesi. *Tüberküloz ve Toraks Dergisi*. 2007; *55*(2), 167-173.

241: Hashimoto S, Kohsaka M, Morita N, et al. Vitamin B12 enhances the phase-response of circadian melatonin rhythm to a single bright light exposure in humans. *Neuroscience letters*. 1996; *220*(2), 129-132.

242: Mayer G, Kröger M, Meier-Ewert K. Effects of vitamin B12 on performance and circadian rhythm in normal subjects. *Neuropsychopharmacology*. 1996; *15*(5), 456.

243: Takahashi K, Okawa M, Matsumoto M, et al. Double-blind test on the efficacy of methylcobalamin on sleep–wake rhythm disorders. *Psychiatry and clinical neurosciences*. 1999; *53*(2), 211-213.

244: Robinson C. R, Pegram G. V, Hyde P. R, et al. The effects of nicotinamide upon sleep in humans. *Biological psychiatry*. 1977; *12*(1), 139-143.

245: Müller M. J, Olschinski C, Kundermann B, et al. Subjective sleep quality and sleep duration of patients in a psychiatric hospital. *Sleep Science*. 2016; *9*(3), 202-206.

246: Xi B, He D, Zhang M, et al. Short sleep duration predicts risk of metabolic syndrome: a systematic review and meta-analysis. *Sleep medicine reviews*. 2014; *18*(4), 293-297.

247: Iftikhar I. H, Donley M. A, Mindel J, et al. Sleep duration and metabolic syndrome an updated dose–risk metaanalysis. *Annals of the American Thoracic Society*. 2015; *12*(9), 1364-1372.

248: Hirshkowitz M, Whiton K, Albert MS, et al. National Sleep Foundation's updated sleep duration recommendations: final report, *Sleep Health Journal of the National Sleep Foundation*. 2015; 233–243,

249: Agargun M. Y. Pittsburgh uyku kalitesi indeksinin gecerligi ve guvenirligi. *Turk Psikiyatri Dergisi*. 1996; *7*, 107-115.

250: Peltzer K, Pengpid S. Sleep duration, sleep quality, body mass index, and waist circumference among young adults from 24 low-and middle-income and two high-income countries. *International journal of environmental research and public health*. 2017; *14*(6), 566.

251: Anderson A. S, Good D. J. Increased body weight affects academic performance in university students. *Preventive medicine reports*. 2017; *5*, 220-223.

252: Štefan L, Čule M, Milinović I, et al. The relationship between adherence to the Mediterranean diet and body composition in Croatian university students. *European Journal of Integrative Medicine*. 2017; *13*, 41-46.

253: Pengpid S, Peltzer K. Prevalence of overweight/obesity and central obesity and its associated factors among a sample of university students in India. *Obesity research & clinical practice*. 2014; *8*(6), e558-e570.

254: So W. Y, Swearingin B, Robbins J, et al. Relationships between body mass index and social support, physical activity, and eating habits in African American university students. *Asian nursing research*. 2012; *6*(4), 152-157.

255: Haghighatdoost F, Karimi G, Esmaillzadeh A, et al. Sleep deprivation is associated with lower diet quality indices and higher rate of general and central obesity among young female students in Iran. *Nutrition*. 2012; *28*(11), 1146-1150

256: Rahe C, Czira M. E, Teismann H, et al. Associations between poor sleep quality and different measures of obesity. *Sleep medicine*. 2015; *16*(10), 1225-1228.

257: Gildner T. E, Liebert M. A, Kowal P, et al. Sleep duration, sleep quality, and obesity risk among older adults from six middle-income countries: Findings from the study on global ageing and adult health (SAGE). *America. 2014*

258: Tom S. E, Berenson A. B. Associations between poor sleep quality and psychosocial stress with obesity in reproductive-age women of lower socioeconomic status. *Women's Health Issues*. 2013; *23*(5), e295-e300.

259: Bidulescu A, Din-Dzietham R, Coverson D. L, et al. Interaction of sleep quality and psychosocial stress on obesity in African Americans: the Cardiovascular Health Epidemiology Study (CHES). *BMC Public Health*. 2010; *10*(1), 581.

260: Logue E. E, Scott E. D, Palmieri P. A, et al. Sleep duration, quality, or stability and obesity in an urban family medicine center. *Journal of clinical sleep medicine: JCSM: official publication of the American Academy of Sleep Medicine*. 2014; *10*(2), 177.

261: Hung H. C, Yang Y. C, Ou H. Y, et al. The association between self-reported sleep quality and overweight in a Chinese population. Obesity. 2013; *21*(3), 486-492.

262: Cheng S. H, Shih C. C, Lee I. H, et al. A study on the sleep quality of incoming university students. *Psychiatry research*. 2012; *197*(3), 270-274.

263: Stein M. B, Belik S. L, Jacobi F, et al. Impairment associated with sleep problems in the community: relationship to physical and mental health comorbidity. *Psychosomatic Medicine*. 2008; *70*(8), 913-919.

264: Jennings J. R, Muldoon M. F, Hall M, et al. Self-reported sleep quality is associated with the metabolic syndrome. *Sleep*. 2007; *30*(2), 219-223.

265: Li L, Fu J, Yu X. T, et al. Sleep duration and Cardiometabolic risk among Chinese school-aged children: do Adipokines play a mediating role?. *Sleep*. 2017; *40*(5), zsx042.

266: Liu R. Q, Qian Z, Wang S. Q, et al. Sex-specific difference in the association between poor sleep quality and abdominal obesity in rural Chinese: a large population-based study. *Journal of clinical sleep medicine: JCSM: official publication of the American Academy of Sleep Medicine*. 2017; *13*(4), 565.

267: Kim M. Association between objectively measured sleep quality and obesity in community-dwelling adults aged 80 years or older: a cross-sectional study. *Journal of Korean medical science*. 2015; *30*(2), 199-206.

268: Crönlein T, Langguth B, Busch V, et al. Severe chronic insomnia is not associated with higher body mass index. *Journal of sleep research*. 2015; *24*(5), 514-517.

269: Johansson A. E, Petrisko M. A, Chasens E. R. Adolescent sleep and the impact of technology use before sleep on daytime function. *Journal of Pediatric Nursing: Nursing Care of Children and Families*. 2016; *31*(5), 498-504.

270: Monma T, Ando A, Asanuma T, et al. Sleep disorder risk factors among student athletes. *Sleep medicine*. 2018; *44*, 76-81.

271: Yılmaz E, Özkan S. Üniversite öğrencilerinin beslenme alışkanlıklarının incelenmesi. *Fırat Sağlık Hizmetleri Dergisi*.2007; *2*(6), 87-104.

272: Vassigh G. Üniversite öğrencilerinin fiziksel aktivite durumları ile sağlıklı beslenme indekslerinin değerlendirilmesi. Ankara, Hacettepe Üniversitesi, 2012.

8. APPENDIX

8.1 Ethical Approval

T.C. YEDİTEPE ÜNİVERSİTESİ

Savı :37068608-6100-15-1397 07/12/2017

Konu: Klinik Araştırmalar
Etik kurul Başvurusu hk.

İlgili Makama (Oğuz Alibaşoğlu)

Yeditepe Üniversitesi Sağlık Bilimleri Fakültesi Beslenme ve Diyetetik Bölürnii Yrd. Doç. Dr. Binnur Okan Bakır'ın sorumlu olduğu "İstanbul'da özel Bir Üniversitede Beslenme ve Diyetetik Bölümü Öğrencilerinin Kahvaltı Alışkanlıkları,ve Uyku Kalitelerinin Bel Çevreleri ile Karşılaştırılması" isimli araştırma projesine ait Klinik Araştirmalar Etik Kurulu (KAEK) Başvuru Dosyası (1372 kayit Numaralı KAEK Başvuru Dosyası) , Yeditepe Üniversitesi Klinik

Araştımalar Etik Kurulu tarafından 06.12.2017 tarihli toplantıda incelenmiştir.

Kurul tarafindan yapılan inceleme sonucu, yukarıdaki isimi belirtilen çalışmamn yapılmasının etik ve bilimsel açıdan uygun olduğuna karar verilmiştir (KARK Karar No: 764).

Prof. Dr. Turgay ÇELİK
Yeditepe Üniversitesi
Klinik Araştırmalar Etik Kurulu Başkanı

8.2 Volunteer Form

Sayın Katılımcı,

Aşağıda detayları verilen çalışmaya katılmayı kabul ettiğiniz takdirde kabul ettiğinize dair imzalayarak lütfen ekteki anketi doldurup yardımcı araştırmacıya teslim ediniz.

Dyt Oğuz Alibaşoğlu

Araştırmanın Adı: İstanbul'da Özel Bir Üniversitede Beslenme ve Diyetetik Bölümü Öğrencilerinin Kahvaltı Alışkanlıkları ve Uyku Kalitelerinin Bel Çevreleri ile Karşılaştırılması

Araştırma Yöntemi: Bu araştırma özel bir üniversitede beslenme ve diyetetik öğrencilerinin kahvaltı alışkanlıkları,uyku süresi ve kalitesinin bel çevreleri kalınlığının birbirine bağlı olarak değerlendirilmesini amaçlayan bir anket çalışmasıdır.Çalışma yüz yüze görüşerek sorular sorma,kendi kendine cevaplanacak kahvaltı alışkanlıkları,öğün atlama ve bel çevresi ölçümlerinden oluşmaktadır.Hiç bir girişimsel işlem içermemektedir.İsim bilgisi alınmayacak olup elde edilen bilgiler bilimsel paylaşım dışında hiç bir koşulda kullanılmayacaktır.

Araştırma Süresinse 24 Saat Ulaşılabilecek Kişi Adı/Soyadı/Soyadı Oğuz Alibaşoğlu/0554 630 78 78

Bilgilendirilmiş Gönüllü Olur Formundaki tüm açıklamaları okudum.Söz konusu araştırmaya,hiçbir baskı ve zorlama olmaksızın kendi rızamla katılmayı kabul ediyorum.

Adı/Soyadı/İmzası/Tarih

Açıklamaları Yapan Kişinin Adı/Soyadı/İmzası/Tarih

Gerekiyorsa İşlemine Tanık Ola Kişinin Adı/Soyadı/İmzası/Tarih

8.3 Questionnaire Form

Anket No:

Boy:

Kilo

Yaş:

Bel Çevresi:

Cinsiyet:

Sınıf:

1)Kahvaltı öğününü atlar mısınız?

a)Evet

b)Hayır

c)Bazen

2)Kahvaltı alışkanlığınız yoksa sebebini belirtebilir misiniz?

a)Sabah uyandığımda iştahsızım

b)Vakit bulamıyorum

c)Hazırlamaya üşeniyorum

d)Ekonomik nedenler

e)Diğer

3)Öğün atlıyor musunuz?

a)Evet **b)**Hayır

4)En çok hangi öğünü atlıyorsunuz? (Cevap birden fazla olabilir.)

a)Sabah **b)**Kuşluk

c)Öğle **d)**İkindi

e)Akşam **f)**Gece

5)Öğün atlıyorsanız sebepleriniz nelerdir?

a)Vakit bulamama

b)Ekonomik nedenler

c)Dışarıda aranılan yemekleri bulamama

d)İştahsızlık

e)Diğer

6)Nerede kalıyorsunuz?

a)Evde arkadaşlarla

b)Evde aileyle

c)Yurt

7)Günlük uyku için ayırdığınız süre ne kadar?

a)4-6 saat

b)6-8 saat

c)8-10 saat

d)10 saatten fazla

8)Rutin uyku süreniz dışında günün herhangi bir başka saatinde uyuyor musunuz?Uyuyorsanız ne zaman olduğunu belirtiniz.

a)Evet….

b)Hayır

9)Uyku düzensizliği yaşıyor musunuz?

a)Evet

b)Hayır

10)Uyku düzensizliği yaşıyorsanız bu dönemde iştah durumunuz nasıl değişiyor?

a)İştahım artıyor.

b)İştahım azalıyor.

c)İştahımla ilgili bir değişiklik olmuyor.

11)Uyku düzensizliği yaşıyorsanız uyku düzensizliği yaşadığınız dönemde besin tercihleriniz değişiyor mu?

a)Evet

b)Hayır

12)Uyku düzensizliği yaşadığınız dönemde besin tercihleriniz ne yönde değişiyor? (Cevap birden fazla olabilir.)

a)Paketlenmiş gıda tüketimim artıyor.

b)Tatlı tüketimim artıyor.

c)Yağlı gıda tüketimim artıyor.

d) Gıda tüketimim azalıyor.

8.4 Pittsburgh Sleep Quality Index

Hastanın Adı Soyadı: Tarih: / /

Aşağıdaki sorulara vereceğiniz cevaplar geçen ay içindeki gün ve gecelerin çoğuna uyan en doğru kaşılığı belirtilmelidir. Lütfen tüm soruları cevaplandırınız.

1. Geçen ay geceleri genellikle ne zaman yattınız? …….
2. Geçen ay geceleri uykuya dalmanız ne kadar zaman(dakika) aldı? ……..dakika

3.Geçen ay sabahları genellikle ne zaman kalktınız? …….
4.Geçen ay geceleri kaç saat uyudunuz(bu süre yatakta geçirdiğiniz süreden farklı olabilir) ……. Saat

5.Geçen ay aşağıdaki uyku problemlerini ne sıklıkla yaşadınız?

Haftada

a)30 dakika içinde uykuya dalamadınız

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

b) Gece yarısı veya sabah erkenden uyandınız

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

c) Tuvalete gittiniz

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

d)Rahat bir şekilde nefes alıp veremediniz

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

e) Aşırı derecede üşüdünüz

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

f) Aşırı derecede sıcaklık hissettiniz

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

g) Kötü rüyalar gördünüz

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

h) Ağrı duydunuz

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

i) Diğer nedenler

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

j) Öksürdünüz veya gürültülü bir şekilde horladınız

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

6. Geçen hafta uyku kalitenizi bütünü ile nasıl değerlendirirsiniz?

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

7. Geçen hafta uyumanıza yardımcı olması için ne kadar sıklıkla uyku ilacı(reçeteli veya reçetesiz) aldınız?

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

8. Geçen hafta araba sürürken, yemek yerken veya sosyal bir aktivite esnasında ne kadar sıklıkla uyanık kalmak için zorlandınız?

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

9. Geçen ay bu durum işlerinizi yeteri kadar istekle yapmanızda ne derece problem oluşturdu?

0) Hiç problem oluşturmadı

1) Yalnızca çok az bir problem oluşturdu

2) Bir dereceye kadar problem oluşturdu

3) Çok büyük bir problem oluşturdu

10. Bir yatak partneriniz var mı?

0) Bir yatak partneri veya oda arkadaşı yok

1) Diğer odada bir partneri veya oda arkadaşı var

2) Partneri aynı odada fakat aynı yatakta değil

3) Partner aynı yatakta

11. Eğer bir oda arkadaşı veya yatak partneriniz varsa ona aşağıdaki durumları ne kadar sıklıkta yaşadığınızı sorun.

a) Gürültülü horlama

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

b) Uykuda nefes alıp verme arasında uzun aralıklar

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

c) Uyurken bacaklarda seğirme veya sıçrama

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

d) Uyku esnasında uyumsuzluk veya şaşkınlık

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

e) Diğer huzursuzluklarınız

0)Hiç 1) 1'den az 2) 1-2 kez 3) 3'den çok

9. CURRICULUM VITAE

Kişisel Bilgiler

Adı	Oğuz	**Soyad**	Alibaşoğlu
Doğum Yeri	Kocasinan/Kayseri	**Tarihi**	11.10.1994
Uyruğu	T.C	**TC Kimlik No**	
E-mail:	oguzalibasoglu34@gmail.com	**Telefon**	0554 630 7878

Öğrenim Durumu

Derece	**Alan**	**Mezun Olduğu Kurum**	**Mezuniyet Yılı**
Yüksek Lisans	**Beslenme ve Diyetetik**	**Yeditepe Üniversitesi**	**2018**
Lisans	**Beslenme ve Diyetetik**	**İstanbul Arel Üniversitesi**	**2016**
Lise	**Anadolu**	**Fatma Kemal Timuçin Anadolu Lisesi**	**2012**

Yabancı Dil Bilgisi

Yabancı Dil	**Yabancı Dil Sınav Notu**
İngilizce	71

İş Deneyimi

Görev	**Kurum**	**Süre(Yıl-Yıl)**
Diyetisyen	**NUHİL GIDA**	**2018-2018**
Diyetisyen	**Erciyes Üniversitesi Tıp Fakültesi Hastanesi**	**2017-2017**

Bilgisayar Bilgisi

Program	**Kullanma Beceri**
Microsoft Office	İyi
Spss	Orta