

T.C

YEDITEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCE

DEPARTMENT OF NUTRITION AND DIETETICS

**EATING DISORDER STATUS OF INDIVIDUALS  
APPLYING TO NUTRITION AND DIET  
POLICLINIC OF A PRIVATE HOSPITAL  
LOCATED IN ISTANBUL AND RELATION OF  
OBESITY HISTORY AND PREVIOUS DIET  
FREQUENCY**

**MASTER OF SCIENCE THESIS**

**Diyetisyen**

**Merve Saraç**

**ISTANBUL- 2019**

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**MASTER OF SCIENCE THESIS**

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**ISTANBUL- 2019**

## TEZ ONAYI FORMU

Kurum : Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü



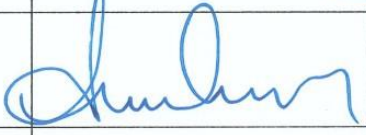
Program : Beslenme ve Diyetetik

Tez Başlığı : Eating Disorder Status of Individuals Applying to Nutrition And Diet Polyclinic of a Private Hospital Locates In Istanbul and Relation of Obesity History and Previous Diet Frequency

Tez Sahibi : Merve Saraç

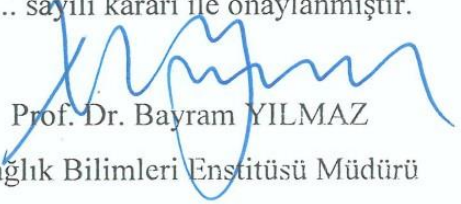
Sınav Tarihi : 17.07.2019

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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.

02/09/2019

Merve Saraç





## ACKNOWLEDGEMENTS

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

First i would like to express my thanks to, my supervisor Assistant Professor Binnur Okan Bakır for her encouragements and continuous support, motivation. Her guidance helped me in all the time of research and writing of thesis.

My special thanks to my parents, brother and sister for their continued support and encouragement all my life. Finally i would like to thank my loving husband helped and supported me during my thesis work.

I present my thanks and gratitude

Merve Saraç Dengizek



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## **LIST OF ABBREVIATIONS**

**AN:** Anorexia Nervosa

**BED:** Binge Eating Disorder

**BMI:** Body Mass Index

**BMR:** Basal Metabolic Rate

**BN:** Bulimia Nervosa

**DSM-IV :** Introduction Diagnostic and Statistical Manual of Mental Disorders 4

**DSM-V:** Introduction Diagnostic and Statistical Manual of Mental Disorders 5

**ED:** Eating Disorders

**ICD-10:** International Classification of Diseases-10

**Kcal:** kilocalorie

**Kg:** Kilogram

**MNT:** Medical Nutrition Therapy

**NES:** Night Eating Syndrome

**NHANES:** National Health and Nutrition Examination Survey

**MNT:** Medical Nutrition Therapy

**SPSS:** Statistical Packages for Social Science

**WC:** Waist Circumference

**WHO:** World Health Organization

## **ABSTRACT**

**Saraç M. Eating Disorder Status of Individuals Applying to Nutrition And Diet Policlinic of a Private Hospital Located In Istanbul and Relation of Obesity History and Previous Diet Frequency, Yeditepe University, Institute of Health Science, Nutrition and Dietetic Department, Master of Science Thesis, Istanbul. 2019**

The aim of this study; to evaluate the relationship between Eating Disorder Status and obesity history and previous diet frequency in individuals who applied to Nutrition and Diet policlinic of Private Hospital in Istanbul. The study included 202 participants between December 2017 and May 2018. Age, gender, height, weight, obesity/overweight history and diet experience in the past was questioned. Eating Attitude Test-40 (EAT-40) was used in order to detect Impaired Eating Behavior.

It was found that, 24.3% (n=49) had a high risk of eating disorder according to EAT-40 cut-off score and 16.8% (n=34) of the participants reported obesity/overweight in preschool period. While 33.2% of the participants stated that they did not have any diet in the last 6 months, 31.2% of the participants stated that were too much dieted in the last 5 years. There was a significant relationship between pre-school obesity/overweight history and EAT-40 scores. There was no significant relationship was found between school age and adolescence period and scale score. There was a significant relationship between the dietary frequency in the last 6 months and scale scores ( $p=0.001$ ). The rate of those who did not have any diet in last 6 months, 1 year, 3 years, 5 years was significantly higher in the normal group regarding eating attitude ( $p=0.001$ ) while the rate of those who had diet too much in last 6 months and 3 years ( $p=0.006$ ), ( $p=0.001$ ) and dieted 3-10 times in last year ( $p=0.039$ ), was significantly higher in impaired eating attitude group.

**Key Words:** Diet Frequency, Eating Disorders, Previous Obesity History, Eating Attitude Test- 40

## ÖZET

**Saraç M. , İstanbul'da Özel Bir Hastanenin Beslenme ve Diyet Polikliniğine Zayıflamak Amacıyla Başvuran Bireylerin Yeme Davranışı Bozukluğu ile Obezite Geçmişi ve Geçmişteki Diyet Sıklığının İlişkisi, Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Anabilim Dalı Yüksek Lisans Tezi, İstanbul 2019.**

Bu çalışmanın amacı; İstanbul'da Özel Bir Hastanenin Beslenme ve Diyet Polikliniğine Zayıflamak Amacıyla Başvuran Bireylerin Yeme Davranışı Bozukluğu ile Obezite Geçmişi ve Diyet Sıklığının İlişkisinin değerlendirilmesidir. Araştırmaya Aralık 2017- Mayıs 2018 tarihleri arasında, 202 katılımcı dahil edilmiştir. Katılımcıların yaş, cinsiyet, boy, kilo bilgileri, geçmiş obezite/fazla kilo varlığı ve diyet yapma sıklıkları sorgulanmıştır. Yeme davranışında bozulmayı saptamak için Yeme Tutum Testi-40 (YTT-40) kullanılmıştır.

Çalışmadan elde edilen verilere göre toplam 202 katılımcının, %24.3 (n=49)'ünün YTT-40 kesme puanının 30'un üstünde olduğu saptanmıştır. Katılımcıların %16.8 (n=34)'i okulöncesi dönemde obezite/fazla kilo sorunu olduğunu bildirmiştir. Katılımcıların %33.2 (n=67) 'si son 6 ay içinde hiç diyet yapmadıklarını belirtirken, %31.2'si ise son 5 yıl içinde "hatırlamadığım kadar çok" diyet yaptığını belirtmiştir. Okul öncesi obezite öyküsü ile ölçek puanları arasında anlamlı bir ilişki bulunurken, okul çağı ve ergenlik dönemi ile anlamlı bir ilişki gözlenmemiştir. Bununla birlikte Son 6 ay,1 yıl, 3 yıl ve 5 yıl içinde "hiç diyet yapmadım" diyenlerin oranı, ölçek puanına göre normal grupta anlamlı derecede yüksek bulunurken (p=0.001), son 6 ay ve son 3 yıl içinde "hatırlamadığım kadar çok" diyet yaptım diyenlerin oranı (p=0.006), (p=0.001); son 1 yıl içinde "3-10 kez" diyet yaptım diyenlerin oranı bozulmuş yeme tutumu olan grupta anlamlı derecede yüksek bulunmuştur.

**Anahtar Sözcükler:** Diyet Sıklığı, Yeme bozuklukları, Obezite Geçmişi, Yeme Tutum Testi-40

## INTRODUCTION

The global prevalence of obesity -among girls and boys that was less than from 1% in 1975 while 6-8% in 2016. Over the same period, among men (3% to 11%) and women (6% to 15%) has increased over the 40 years (1). Aim of the obesity management contain weight control and reducing excess body weight and also regulating other parameters to control related risk factors, as well as there are some components of treatment of obesity. For treatment with one or more of these ways is possible. These ways are medical nutritional therapy, exercise, cognitive therapy, pharmacotherapy and surgery (2). The US Institute of Medicine defined success as weight loss of  $\geq 5\%$  of body weight maintained for 1 or more years. During the weight-reduction program, most individuals achieve substantial results over the short period generally. However at the end of the weight-reduction program within 1 to 5 years, patients may tend to mostly regain almost all of their lost weight (3). There are many effective weight loss strategies available but most are only temporarily effective over a period 3-6 months. It is stated that less than only 20% patients that have try to lose weight are can achieve a 10% reduction over a year (4). It is reported that prevalence of diet to lose weight is 21% to 56% in women and 6% to 25% in men in Western society, (5). Despite the best efforts of researchers, most obese individual who lose weight are probable to regain weight. Many do this losing and regaining behavior repeatedly that has been labeled weight cycling. Also there are many concerns about dietary restriction or dieting to lose weight, can accelerate eating disorders among those previously affected (6).

The existence of the relationship between diet and eating disorders was supported by retrospective data. In this sense, it was reported that most of individuals with eating disorders started to had diet before the impaired eating behavior (7). It is thought that dieting has negative effects due to weight control efforts and caloric restriction effect on mood and failures. According to theories, frequently dieting results risk for bulimic pathology in that individuals may binge due to effects of caloric deprivation. In this context, dieting might be support binge eating disorders because of violating rigid dietary rules can result in eating large amounts food and bingeing (8).

## **2. LITERATURE REVIEW**

### **2.1. Obesity**

Obesity is simply defined as increased fat storage which may impair health. Obesity as a result of many endocrine and metabolic functions of the body is more than normal fat tissue, physiological, organic, systemic, hormonal, metabolic, aesthetic, psychological and social problems that can lead to disease as well as hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, metabolic syndrome, and even cancer (9,10)

#### **2.1.1. Diagnosis of Obesity**

The most commonly used parameter in the diagnosis of obesity is Body mass index (BMI) is calculated with dividing body weight (kg) to height (meters). Although BMI (kg/m<sup>2</sup>) above 30 is used as a criterion for obesity; the diagnosis of this depends on the measurement of body fat. Therefore, BMI is a limited parameter for the clinical classification of the body weight as it ignores body composition (11). However, BMI is obtained from anthropometric measurement, body weight and height measurements and is used in obesity related studies in order to be easy reach, not to discriminate sex differences and to be applied to all individuals. It is also a standard height-weight index adopted by the WHO (12).

Unlike BMI classification for adults, determination in weight status of children, age and gender specific percentile is used for BMI because of children's body composition specifies as they age and varies between boys and girls. For the children's and teenager's weight status, overweight is defined as a BMI at 85th percentile-below the 95th percentile; obesity is defined as a BMI at or above the 95th percentile for children and teens of the same age and sex (13).

Measurements of waist circumference (WC) has been used by health authorities and societies in clinical guidelines to assess obesity-related epidemiological studies (14). For the National Institutes of Health protocol, the WC measure should be taken at the highest point of iliac crest while according to WHO protocol, the measure is taken at the mid-point between highest point of the iliac crest and the last floating rib. Waist circumference measurement in adults is classified as; low risk for obesity: in men WC 93.3 cm or less, in women WC 79.9 cm or less,

increased risk: in men 94.0 to 101.9 cm, in women 80.0 to 87.9 cm and high risk in men 102.0 cm or more in women 88.0 cm or more (15). Also BMI classified in adults categories as ; underweight (less than 18.5 kg/m<sup>2</sup>), normal range (18.5 to 25 kg/m<sup>2</sup>) overweight (25.0 to 29.9 kg/m<sup>2</sup>), obese (30kg/m<sup>2</sup> and more), morbidly obese (40 kg/m<sup>2</sup> or more) (16).

Recently, waist circumferences has been widely used in addition to BMI and even the use of the waist circumference parameter with BMI was more effective than the use of BMI alone. Also BMI is used as a general indicator of body fat and is used to classify obesity but does not provide information on the distribution of obesity. Therefore , it may cause misconceptions in individuals with very high muscle mass, such as athletes, in children of growth age and in various situations that cause edema (17).

There are various methods have been used to determined body adiposity as skinfold thickness measurement and bioelectrical impedance analysis (BIA). In the skinfold tickness measurement method, it have been used calipers at particular body sites to determines body fatness and this method shows a strong correlation with adiposity measurement as for that reference method. Another method is BIA which uses equations include impedance values and estimates total body water, fat-free mass and fat mass. The percentage of body fat which  $\geq 25\%$  in men and  $\geq 35$  women indicated obesity, can be calculated using fat mass and body weight (18).

### **2.1.2. Etiology of Obesity**

Obesity occurs as a results of environmental, genetic, behavioral, physiological and cultural factors that related excessive fat accumulation and energy imbalance. Though genes have an significant task in the etiology of obesity, behavioral and environmental factors like excess energy intake with sedentary lifestyles, are primarily for the increase in obesity (19). It is thought that causal mechanisms that provide the spread of obesity include some environmental components which include changes in diet and lifestyles, reduced physical activity, reduced intake of fruits an vegetables, increased intake of fast food, and induction via social and geographical networks (20). The susceptibility to obesity is influenced by genes that may affect energy expenditure, fuel utilization, and even taste

preferred, all of which affect a person's behavioral response to the environment. (21).

In the etiology of pediatric obesity, biological, environmental, physiological and contextual factors play an important role. One prospective study over a 9 year period evidenced that the weight status of the parents was an important risk factor for pediatric obesity. This study demonstrated that identify a number of independent risk factors such as child temperament, parental attitudes toward thinness and amount of sleep time in childhood (22). According to the review study that subsumed 25 longitudinal studies from the world, each data referred that overweight/obese young girls and boys had a greater risk for becoming overweight adults (23). Also certain periods of childhood are an important factor in the future weight situation. Concordantly, prenatal deficiencies in the prenatal period, gestational diabetes, high birth weight; It is positively correlated with obesity in later life (24).

### **2.1.3. Prevalance of Obesity**

The prevalence of obesity between 2011 and 2012 was %16.9 in adolescent, %34.9 in adults. This ratio is higher than the data of 2009-2010. According to the subgroup analysis; between 2011-2012, obesity rate decreased from %14 to %8 in children between 2 and 5 aged (25). According to the data of The National Health and Nutrition Examination Survey (NHANES), the prevalence of obesity increased in adolescents between the years of 1994-2000; the age range of 6-19 is %15. In addition, according to the data of NHANES, it was shown that the prevalence of childhood-adolescent obesity increased significantly in girls and boys in 2003-2004 (%14 and %18.2). It is stated that 1/3 of children and adolescents (2-19 age) are overweight. These results; pointed out that the percentage of obese and overweight children in the last 10 years has increased between %200 and %400 (22). Another study show that of United States children aged 2-19 years in 2003-2006, %11.3 children that above the 97th percentile of BMI, also %31.9 were at above the 85th percentile for BMI. It is enounced that these findings have been relatively stable since 1999 (26). According to the international obesity reports of the World Health Organization, more than 1.1 billion adults are obese and overweight (including 312 million obese). In this sense, risk-bearing areas in the world due to significant increases in the prevalence of obesity; Middle East, Southeast Asia, China and



Pasific. One study show that which evaluating the worldwide researches in 1980-2013; it has been reported that the number of obese adults, 857 million in 1980, increased to 2.1 billion in 2013, and more that %50 of the 671 million obese individuals in the world live in USA, Germany, India, Russia, Brazil, China, Mexico, Egypt, Pakistan and Indonesia. Between 2009-2010, the number of obese adults in the U.S was recorded as 78 million (27,28)

In Turkey, seven geographical regions of randomly selected individuals from prospective study that fallowed 12 years, %25.2 of men over 30 age and %44.2 of women reported the BMI was 30 kg/m<sup>2</sup> and above. When all participants were classified as 31-49 years and over 50 years; there was no significant difference in the frequency of obesity among males. However the prevelance of obesity in middle-age women was found that %38 , in over 50 age was found to be %50.2 It was found that these rates increased in both sexes in the studies conducted from 1990 to 2003 (29).

#### **2.1.4. Treatment of Obesity**

##### **2.1.4.1. Lifestyle Changes**

The difficulty in treating obesity is manifested in the long-term preservation of this reduces body weight after the weight loss period. The objective in the treatment of obesity should not only be weight loss, but also change in behaviour and lifestyle (30). In a whole weight loss treatment; change of diet, increase of physical activity, behavioral therapy are effective.

##### **2.1.4.1.a. Physical Activity**

Regular physical activity enhances health and reduces risk factors for mortality such as cardiovascular disease, Type 2 Diabetes Mellitus, colon cancer, osteoporosis. Studies on the effect of physical activity on adipose tissue; it was found that exercising decreased BMI by 2.3% and skinfold measurement by 11.5% (31). Physical Activity not only contributes to energy expenditure, but is also effective in regulating the balance of fat and energy. Likewise it contributes to the metabolic adaptation of the body. In addition to all this, there is a strong relationship between the content of food consumed and activity performance (32). Physical activiyy is the

complement of weight loss therapy and has direct and indirect benefits in weight loss programs. Increasing physical activity affects weight loss by increasing energy consumption and at the same time reducing body fat during weight loss and maintaining muscle weight. It also improves glucose tolerance, insulin sensitivity and lipid profile. In addition, it improves self-confidence and reduces anxiety and depression. In other words, it is an element that increases motivation and continuity in weight loss programmes. A wide range of physical activity terms may include some activities such as ; gardening and housework, walking, dancing and group-personal sports. At the beginning of the weight loss program, physical activity is provided to be least 3-5 days a week for 30-45 min (33,34)

The study which performed a systematic review of randomized trials to estimate the efficacy of nonsurgical interventions for pediatric obesity found that only the support of physical activity was moderately effective, and that physical activity and dietary change combined with the participation of parents, especially in children aged 8 and under, provided a better effect (35). Another study that was carried out 2121 primary school students in the Sakarya, Turkey, in order to examine the effects of the diet and diet + exercise on changes in weight on adolescent. Participants were supported by dietitians and trainers for a period of 14 weeks. One group only dieted while the other group diet+ exercise application has done. At the end of the study, there was a significant change between both groups but compared with diet group, the difference was greater in the diet plus exercise group (36). A randomized controlled trial that included 52 obese male participants performed to determine the relevant diet or exercise induced weight loss program on subcutaneous fat, visceral fat, skeletal mass and insulin sensitivity. Participants were divided into 5 different groups ( diet group, exercise group, exercise without weight loss group and control). As a result of the study; despite total fat decreased in both weight loss groups, it was found that exercise induced group had weight loss was greater than diet group (  $p = 0.03$ ) (37).

According to American Association of Clinical Endocrinologists and American College of Endocrinology, weight loss programs which is combined with regular physical activity (aerobic exercise and training) improves blood glucose, lipid levels and effective at the Grade A level in the treatment of diabetes, hypertension, non-alcoholic fatty liver diseases and osteoarthritis. In overweight and obese

individuals, the physical activity program should last average 150 minutes per week and include reasonable intensity (brisk walking, training), individuals should start an activity slowly, afterwards increase intensity. The programs should be appropriate to learn technique, established goals (38).

#### **2.1.4.1.b. Medical Nutrition Therapy (MNT)**

The word “diet” has negative implication for many people. However “diet” indeed comes from the Greek word “dieta” which means “way of live” and prescribing a new way of life, one which reduces the risk of death and disease (39). In this context diet of chronic treatment has 2 meanings such acute stage and chronic stage. In the acute stage, diet has primary intervention used to reduce symptoms of that is medicine; in the chronic stage, diet is the essential component of treatment and lifestyle. In addition, behaviour change and physical activity should be increased in the content of the treatment. An appropriate diet therapy should be restricted to total energy but should include all recommended nutrients (40).

### **Principles of Medical Nutrition Therapy**

#### **Energy**

Daily energy intake in the diet therapy of obesity should be reduced to provide an individual weight loss of 0.5-1 kg per week. The basic principle in determining the amount of daily energy in diet therapy is to provide less energy than the energy consumed by the individual. Energy should not be under the basal metabolic rate (BMR) or resting metabolic rate. In the dietary therapy of obesity, the energy (calorie) restriction should be individualized and the eating habits, physical activity, comorbidities and previous dietary attempts should be considered. Generally, it is sufficient and appropriate to reduce the daily energy intake by 15-30%. However it is commonly for obese patients to report the energy intake incorrectly. Although there are major changes in energy requirements among individuals, depending on factors such as sex, age, BMI and physical activity; the average daily energy requirement can be calculated with 25/kcal/kg (This method creates a greater energy deficit in males for same weight). Recommended weight loss therapy is generally recommended to have an energy gap of 600 kcal/day. An average of 600 kcal per day

in the daily energy gap will provide an average weight loss of 0.5 kg per week (33, 40, 41).

### **Protein**

The word “protein” in Latin means, “ essential nitrogen element for living beings” . The structure of the living cell which is the smallest part of the body and the enzymes that catalyze the metabolic reactions are protein. Protein is essential for growth because it means proliferation of cells (42).The energy from protein in the weight loss diet should be 20-25% of the total energy received and better results can be obtained by increasing the amount of energy coming from the protein (41).

### **Lipid**

Fats perform many essential functions in the body; however questions exist regarding both the types and the amount of fat that we should eat. The acceptable macronutrient distribution range for fat 20% to 35% of total calories. Too much fat in the diet can supply more calories than required for immediate use, with the excess stored as adipose tissue (43). According to 2-year dietary-intervention study which evaluated compare the effectiveness to low fat diet, calorie restriction diet, Mediterranean diet, low carbohydrate diet, non-restricted diet. In study, it was founded that the average weight loss was 5.5 kg for low-carbohydrate group and 4.6 kg for the Mediterranean-diet group while 3.3 kg for low-fat diet group. Therefore the Mediterranean and low-carb diet strategies are effective and safe alternatives with the low-fat diet (44).

### **Carbohydrates**

Carbohydrates is one of the nutrients that provides energy to the body and is the most common element in the nutrients taken. Moderate carbohydrate, 44-46% of daily energy should be provided from carbohydrates in adults on a balanced diet. It also uses only carbohydrates for brain tissue energy (45).Complex carbohydrates which rich in dietary fiber should be used in balanced diet instead of simple carbohydrates such as refined sugar. Foods with low glycemic index and low glycemic load should be preferred. Whole grains, legumes and vegetables is that low in glycemic index and glycemic load (41).

#### **2.1.4.2. Pharmacotherapy**

Obese patients tend to use weight loss medications with the thought that they will lose weight easily and in a short time. However, none of the drugs used today is an “ideal drug”. In the treatment of obesity, pharmacotherapy can be combined with diet and exercise, but treatment should be decided if the BMI  $\geq 30$  kg/m<sup>2</sup> and accompanied by a metabolic disorder in obesity or in the presence of BMI  $\geq 27$  kg/m<sup>2</sup> and at least 2 risk factors. In the pharmacotherapy for obesity, the medications are examined in 3 groups that work with different mechanisms: medication that reduce food intake, inhibit fat absorption, increase energy consumption that thermogenesis. Antiobesity drugs approved for long-term treatment are: Orlistat, Sibutramine and Rimonabant. The effect of these drugs on weight loss is less than 5 kg and the effect of the use of drugs on morbidity and mortality has not been specified. After all among the general side effects of drugs; decreased absorption of fat-soluble vitamins, tachycardia, headache, weakness, nausea, vomiting. In addition, studies on the antiobesity medications still continue (46-48)

#### **2.1.4.3. Surgical**

Although nutritional therapy is considered as the primary step in the treatment of obesity; for morbid obese individuals, it is thought that only nutritional therapy is inadequate in some conditions, surgical method can be used.

According to European Clinical Guidelines, presence BMI  $\geq 40.0$  in age groups from 18-60 years or presence BMI 35.0- 39.9 kg/m<sup>2</sup> and co-morbidities as diabetes and other metabolic disorders, severe joint disease and obesity-related psychological problems for individuals, surgery considered (33).

Surgical treatment of obesity is preferred more frequently than before. Surgical procedures, cause weight loss by causing malabsorption or limiting food intake. Combined methods are available that use both methods together. Roux-en Y Gastric Bypass, Sleeve Gastrectomy, Laparoscopic Gastric Banding are most commonly surgical methods. Although there has been great advances in technique, care and monitoring in bariatric surgery, risk and perioperative complications have not been reduced to zero. Therefore, appropriate patient and technique selection is very important (49,50).

Even though bariatric surgery is an effective method to regulate severe obesity and its comorbidities, behavioral changes that may occur in the long term are not known. After the operation, it was found that high weight loss was observed at first, but some weight regain was observed in 1 year following the operation. During the post-op 6 months, it was increased that portions of the patients and they started snacks. During the post-operative period, severe problematic eating behaviors can be seen such as grazing (long-term continuous eating behaviour), Night-eating Syndrome, stress/emotional eating behavior and loss of control when eating (51). In this sense, even if the patient receives satisfactory results before and after the operation, a multidisciplinary approach is required, including nutrition education, behavioral changes and psychological support.

#### **2.1.5. Weight Management and Maintenance**

There are several theories that have been recommended to explain the weight regain in which biological and behavioral factors play an important role. Reduction in basal and activity-related energy expenditure, changes in hormones that hunger and satiety associates, and an increase in fat cell stress in response to fat mass reduction have been remarked as potential factors associated with weight regain. Also several eating behavioral factors have been suggested to increase risk of weight regain. These factors can be explained as loss of control over-eating, binge eating and response to negative emotions (52).

The difficulty in preventing weight regain after weight loss programs and maintaining weight regain still remains important. Most patients regain weight after completing treatment. After the lifestyle change treatment, 30% to 35% of lost weight was regained in the year. It is seen that isn't adequate weight loss and even regained in 5 years. Although diet and exercise are usable to losing weight in moderately obese adults, there are no recognized rules include both behaviour and lifestyle changes for permanent weight loss (53,54). There are some studies about how weight regain can be prevented when diet and exercise are used together after obesity treatment. One study that objected to determine the prevalence and predictors of weight regain in United States (U.S) adults who experienced substantial weight loss. The data of this study were analyzed from 1999-2002 National Health and Nutrition Examination Survey. The study examined 1310 U.S adults whom aged 20-

84 years and weighed 10% less than their max weight 1 year before they were surveyed. Compared to their 1 year ago, it was found 7.6% of the participants continued to lose weight, 58.9 % maintained and 33.5 % had regained weight. Finally weight regain was higher in sedentary or those who did not apply recommendadions for life style change (55).

According to another study, the long-term effects of diet and exercise after weight loss were investigates. Even though 50% of the participants regained their weight, weight loss was higher in individuals with combined diet and physical activity compared to the only dieted. It was observed that individuals continued to maintain their weight for a long time with continuity of physical activity (54). Adjusment of physical activty at the sufficient frequency and dose affects weight regaining. In one study, there is sufficient evidence that more than 3% of adults will prevent weight regain if the sufficient exercise, 150-200 per week, is supported by an energy-balanced diet. However, moderate physical activity is effective at 250-300 minutes per week with diet therapy to prevent more weight losses (56). On the point of the data of the National Weight loss Registry member which has been established in 1994 and has above 18 aged and weight least 13.6 kg ( mean 33 kg) and has been protect it for 1 year after the successful weight loss. It is reported that in 1 year, 35% of the weight regained 2.3 kg and more, 59% of them maintain ther weight and 6% stil continue lose weight. According to the studies of National Weight Loss Registry, 8 behavioral strategies are reported to be important in maintaining weight loss. These include: the presence of sufficient physical activty, the limitation of some activities such as watching TV; low-calorie and reduce fat intake, regular breakfast habit, maintaining consistent diet through the week and year; control of emational eating habits, to provide control without weight regain too much and regularly weight onself (57,58)

On the other hand, only diet and exercise interventions are considered insufficient to assess long-term weight loss in obese adults. In this sense, it should be known that the problems are more complicated and obesity should be considered a neurobiological disease include physiological elements. At this stage, knowing the factors affecting the weight regain in obese individuals, will be useful forming the strategy to be applied. Body weight is organized by a series of process include homeostasis, environmental and behavioral factors. In homeostatic regulation, the

hypothalamus has central role in regulating signals related to food intake, energy balance and body weight. Obeseogenic environment and related behaviour patterns affect the type of food choice and physical activity. All these there are some physical and psychological factors that affect weight control after weight loss treatment. These are: the obeseogenic environment, and coping with this, and the effect of hormones that linked to the appetite (Unfortunately; despite the weight loss, appetite-related hormones and physiological adaptations at the level of energy homeostasis support weight gain.) nutritional model after diet therapy, distribution of macronutrients in diet, weight loss goals, starting weight of person, physical activity, eating pattern, binge eating behaviour, self-control attitude, life style and social life, methods of coping with stress, motivation, locus of control (the extent to which control over an individual's life experienced internally and externally) , self-efficacy, personality characteristics, depression, mood and psychiatric problems, weight cycle. In addition, the role of other environmental factors, including the depth of sleep and the iatrogenic effects of drugs, should still be considered (59-62).

## **2.2. Eating Disorders**

“Eating” is a behaviour with physiological basis, just like other human behaviours. Most people may eat without feeling hungry, being full or changing their emotions (63). Eating disorders are characterized by a severe impairment of eating behaviour, efforts to control their body weight and shape, as well as abnormal eating behaviour, and a great concern about food; disorders in which abnormal eating behaviors are generally seen in order to lose weight or maintain low body. Although there are diagnostic distinctions depending on the type of eating disorders, weight and body shape concerns, restrictions on diet, binge eating, compensatory behaviors, can be considered as common symptoms among the diagnoses. In these symptoms there are some conditions such as the lack of satisfaction with the body shape or any part of body, anxiety about body weight and desire to lose weight continuously or obsessiveness about thinning, binge eating ( eating too much in a short time), feeling of losing control during eating, compensatory behaviour such as vomiting, using laxatives, diuretic or use of medications to lose weight, fasting, excessive exercise, skipping meals for dietary restriction, rejecting a specific nutrient or establish rules



on nutrients in order to lose weight, features such as stress or unhappiness increase eating habits (64-67).

According to DSM-IV (Introduction of the Diagnostic and Statistical Manual of Mental Disorders 4; American Psychiatric Association 2000) and ICD-10 (International Classification of Diseases-10; World Health Organisation, 1993) Eating Disorder was classified into 3 groups as Anorexia Nervosa, Bulimia Nervosa and Eating Disorder Not Otherwise Specified. However the classification of eating disorders with DSM-V (Introduction of the Diagnostic and Statistical Manual of Mental Disorder –5; American Psychiatric Association, 2013) has changed due to the increase of the prevalence of “not otherwise specified eating disorders” within this content. Evidence suggests that patients classified as not otherwise eating disorders often require only a certain diagnosis of eating disorders and are similarly exposed to severe symptoms as compared to patients with Anorexia Nervosa or Bulimia Nervosa (68-71)

According to American Psychiatric Association DSM-V classification (2013), Eating Disorders were examined in 8 main groups (71). Anorexia Nervosa (AN)

- Bulimia Nervosa (BN)
- Binge Eating Disorder (BED)
- Pica
- Rumination Disorder
- Avoidant/Restrictive Food Intake Disorder (ARFID)
- Other Specified Feeding or Eating Disorder (OSFED) (Atypical AN, Night Eating Syndrome, BN ( of low frequency and/or limited duration) , Purging Disorder)
- Unspecified Feeding or Eating Disorder (UFED)

### **2.2.1. Anorexia Nervosa**

Anorexia Nervosa is characterized by excessive weight loss which causes the body weight to be below the normal level and refuse to reach the weight that should be in the developmental age, although it has a weight below normal, the fear of getting fat. These individuals perceive their body shape differently than they actually, and are always in a desire to be thin, overly afraid of gaining weight, and in this sense they display eating behaviors to be thinner (72,73). In some patients, the restriction

over food intake is also motivated by other behavior, including asceticism, competitiveness and punish themselves and can become socially withdrawn and isolated (74).

It is known that people with AN, consume their foods that minimum amount , excessively slowly, prefer low calorie foods, consume foods into very small pieces, prefer to eat while they are alone and exert extreme exercise after food consumption and show purification behavior include to self-induced vomiting and and using diuretics-laxatives. Even though they eat less, they are obsessively engaged in food preparation and cooking and they transform their eating habits into a ritualistic behaviour. In the same way, it is known that patients calculate calories from food, weigh out frequently and because they are so obsessed with body shape, they prefer full clothes and control their body shape for a long time in front of the mirror (75-77)

AN includes two sub-types: Restricting Sub-type and Binge Eating/Purging subtype. Restricting Sub-type place severe restriction on the amount of food they consume. This type can include many different ways such as counting calories, skipping meals, obsessive rules and rigid thinking, limiting certain type of foods. Also Binge eating/Purging Subtype place severe restriction on the amount of food they consume. Furthermore the patient will also have binge eating or show purging behavior.

#### **2.2.1.1.Diagnostic Criteria for Anorexia Nervosa**

The diagnostic criteria for AN according to American Psychiatric Association, DSM-V (2013) criteria are as follow (71).

- A. Reducing energy intake compare to requirements and having considerably low weight in terms of age, sex, developmental factors and health. ( low body weight; if the weight is below the specified minimum or less than expected in the childhood or adolescent period)
- B. Permanent behaviors that will prevent weight gain through intense fear of gaining weight or getting fat even if the individual's weight is significantly lower.
- C. The presence of a disorder in the perception of the body weight or shape and the lack of any meaningful importance to the body weight and shape during the self-evaluation or importance of the low weight.

In addition, Amenorrhea ( the absence of least three consecutive cycles) is one of the diagnostic criteria according to DSM-IV criteria.

While ICD-10 (International Classification of Disease-10) (WHO, 1993) the criteria for BMI to be equal to or lower than 17.5 kg/m<sup>2</sup> are considered in the diagnostic criteria for AN, according to DSM-IV criteria 85% of the ideal weight for the diagnosis of AN is indicated (77).

The differential diagnosis of AN is difficult because of patient's denial of symptoms and refusal to be treated. In this context, it is difficult to examine the eating behavior and diagnose the cause of weight loss. For this reason, differential diagnosis of medical and psychiatric cases with weight loss such as chronic bowel disease (Crohn's et. al.) and endocrine disease should be determined (78).

### **2.2.2.Bulimia Nervosa**

The main feature of Bulimia Nervosa is binge-eating and after not to gain weight to refer to compensatory methods. After the binge-eating that recurrent and disturbing cognition, the person shows attitude include self-induced vomiting, using diuretic or laxatives, entering the fasting period, exercising excessively. This behaviour occur at least twice a week for a period of 3 months. Although the patient feels relief after compensatory behavior, these feelings are replaced to guilty and shame (79,80)

#### **2.2.2.1.Diagnostic Criteria for Bulimia Nervosa**

The diagnostic criteria for BN according to DSM-V (2013) criteria are as follow (71).

- A. Recurrent episodes of binge-eating ( Binge eating is characterized by a eating discrete period of time, an amount of food that is definitely larger than most people would eating during a similar period of time and under similar circumstances)
- B. Recurrent episodes of compensatory behaviors ( such as self-induced vomiting, using drugs such as laxatives, diuretics, fasting for a certain period of time, compulsive behaviors such as excessive exercise)
- C. A and B have occurred at least once a week within an average of 3 months.
- D. Effect of self-assessment on body shape and body weight

#### E. Presence of AN episode

Unlike DSM-V criteria, sub-categories of BN which include as Purging Type and Non-Purging Type specified in DSM-IV criteria. The person with Purging Type, regularly uses methods such as self-induced vomiting, using laxatives, diuretic, clyster; during the episode of non-purging type, patient experienced compensatory behaviour such as fasting or excessive exercise, but did not apply to methods such as vomiting, laxative etc (68,81).

### **2.2.3. Binge Eating Disorder**

Binge Eating Disorder (BED) can be defined as recurring episodes of eating significantly more food under circumstances in a short period of time than most people would eat and episodes pronounced by feelings of lack of control and anxiousness. In Binge Eating disorders, no compensatory behaviors specific to Bulimia Nervosa are observed. During binge eating, the person exhibits behavior such as eating faster than usual, eating alone or eating too much when not hungry (82).

Compared to individuals with Bulimia Nervosa, individuals with BED show less anxious behavior about their eating patterns and body weight, feel fewer faulty about being obese/overweight, are less concerned with their eating behavior and more socially adjusted and are more comfortable in interpersonal relationships. At the same time, the most important criterion that separates BED from BN is that does not appeal to compensatory behaviors. According to WHO, the prevalence of eating disorders in adults was 1.4%. Although the prevalence of BED in women is higher than men, the most common eating disorder in men is BED (83-86).

#### **2.2.3.1. Diagnostic Criteria for Binge Eating Disorder**

According to revised DSM-IV criteria published in 1999, BED in the not otherwise specified category, was evaluated in the eating disorders category with DSM-V (2013).

The diagnostic criteria for Binge Eating Disorder according to DSM-V (2013) criteria are as follow (71).

A. Recurrent episode of binge eating. This episode is characterized by both:

1. Eating in discrete period of time (for example, within any 2-hour period) an amount of food that is significantly larger than most people would eat in similar period of time under similar circumstances
  2. During the episode, a sense of lack of control over eating ( for example, feeling that one cannot stop eating or control what or how much one is eating)
- B. Binge eating episode is accompanied by three (or more) of following;
1. Eat much more rapidly than normal
  2. Eating until feeling uncomfortably full
  3. Eating large amounts of food when not feeling physically hungry
  4. Eating alone because of being embarrassed by how much one is eating
  5. Feeling disgusted with oneself depressed or very guilty afterwards
- C. Pronounced distress regarding binge eating is present
- D. Binge eating occurs, on average, at least once a week for three months
- E. Binge eating is not associated with the recurrent use of inappropriate compensatory behavior and does not occur exclusively during the course of AN, BN or Avoidant/Restrictive Food Intake Disorder.

#### **2.2.4. Other Specified Eating Disorders**

Other specified eating disorders include; Orthorexia Nervosa, Pica, Night Eating Syndrome, Rumination Disorder

##### **2.2.4.1. Orthorexia Nervosa**

The term “orthorexia” comes from Greek word “orthos” which literally means “accurate, right, valid or correct” and “orexis” meaning hunger or appetite and described as obsessively towards healthy and accurate foods. Orthorexia Nervosa is the person’s obsessive effort to healthy nutrition. Here, the individual’s goal is not to lose weight, healthy nutrition to protect the disease or to put his life on the road. At the same time, the individual’s obsession is not about the amount of food , but about the healthy food or it’s quality. In this context, orthorexia arises from the desire to regain control. For example, an individual suffering from a sudden heart attack, may apply a diet without fat-cholesterol. However, the feature that distinguished the orthorexic person from the person with health consciousness; the orthorexic

individual is overly involved with foods, evaluating the choice of food as a virtue, eating only certain foods that are considered healthy or pure, evaluating others according to their choice of food and being exposed to social isolation due to diet and when does'nt apply to diet correctly, feel guilty (86-89).

The media has emphasise food related disease (mad cow disease, contaminated chicken, mercury poisoning in fish etc.) and it is caused extreme concern about food among people. Thus, this condition enhance Orthorectic behavior and can causes follow rigid diets include categorize and eliminate many food and leads the individuals become distant of their social life and personal relationhsips. (88).

In a study that examined prevalence of Orthorexia nervosa and related factors, 500 Austrian female dieticians participate. The study shows that 34.9% of the participants exhibited some orthorexic behaviors and 12.8 of them have orthorexia. 8.8% of participants who show orthorectic behavior as gained self-esteem when eat healthy food, 4.6% feel guilty when away from their diet, 2.5% beware of eating away from their home because of unhealthy foods, 2.5% avoided eating with other people (90). There is still no adequate medical study on orthorexia nervosa and is not included DSM criteria, so there are no diagnostic criteria (88).

#### **2.2.4.2.Pica**

Pica is the “the tendency to eat other than normal foodstuffs, or to desire them” or it is defined as “the craving and subsequent of non-food substances”. The substances include ash, baby powder, chalk, charcoal, earth, pottery, plaster, paper, soap, cloth, hair, wool, paint, gum, metal; corn starch, flour, ice, uncooked rice. Minimum age for diagnosis of pica is suggested to be 2 age; at younger ages, mounthing different kinds of objects is considered developmentally normal (91,92).

The previous, in DSM-IV classified pica under Feeding and Eating Disorders of Infancy or Early Childhood. DSM-V recently combined the condition disorders of AN, BN and BED to comprise the unitary category of Feeding and Eating Disorders. The “nonfood” term was added to DSM-5 to exclude low-calorie food categories which can be excessive consumption to weight management (93).

According to the DSM-V diagnostic criteria, these behaviors should last longer than one month, are developmentally inappropriate and should not be part of culturally normative phenomenon, meaning that there should be no eating behavior

that is acceptable to cultural basis or society. It is also severe enough require clinical evaluation if this eating behavior occurs during the presence of another mental disorder (such as an autism) or during a medical condition (eg. Pregnancy) (94).

#### **2.2.4.3. Night Eating Syndrome**

Night Eating Syndrome (NES) is characterize by reducing feeding during the day, evening hyperphagia accompanied by frequent nocturnal awakening associated with conscious episodes of compulsive ingestion of food and abnormal circadian rhythms of food and other neuroendocrine factors and it was described by Stunkard et al. in 1955. However it is only recently considered to be sub-category of eating disorders. NES is generally seen among obese individuals who are directed to weight loss treatment and is suggested to be closely related to obesity. Basically, despite the fact that the NES is not a Binge Eating Disorder, people suffering from NES may experience a binge eating episode. Individuals with Binge Eating Disorders eat excessive amount of food in different periods of day, while individuals with NES eat a large part of food they consume at night, but they do not always binge and they dont experience a loss of control during eating and often feel shame and guilt due to their condition (95,96).

Although DSM-V does not include diagnostic criteria for night eating syndrome, it is evaluated in Other Specified Eating Disorders (71).

However, the following criteria are used in the diagnosis of Night Eating Syndrome (97).

- A. Daily eating pattern of evening/night yime hyperphagia of one or both of the the following:
  - 1. At least 25% caloric intake after evening meal
  - 2. At least two episodes of nocturnal eating per week
- B. Awareness and recall of evening- and nocturnal-eating episodes
- C. At least three of the following must be present:
  - 1. Morning anorexia nad/or skipped breakfast four or more mornings per week.
  - 2. Presence of strong urge to eat between diner and sleep onset and/or during night

3. Sleep onset and/or sleep maintenance insomnia four or more nights per week
  4. Presence of belief that one must eat to return sleep
  5. Mood is frequently depressed and/or mood worsens in the evening
- D. The disorder is associated with significant distress and/or impairment in functioning
- E. The disorderes pattern of eating is maintained for least 3 months

The disorder is not secondary substance abuse or dependence, medical disorder, medication or another psychiatric disorder.

### **2.2.5. Etiology and Epidemiology of Eating Disorders**

There are many factors in the background of Eating Disorders such as genetic, sociocultural factors, sex, psychological reasons, family structure.

Research on genetic factors in eating disorders has been going on for many years. In this context family members and twin studies have shown that eating disorder are related to a familial predisposition. In twin studies on AN and BN, it was emphasized that genetic effect 48% and 74% of the Anorexia Nervosa and the BN were 59% and 83%, respectively (98,99). When the sex factors in eating disorders are examined, Although it is seen that the incidence of binge eating disorders in men is higher than that in women, eating disorders are common in women (100).

In recent years, the image of the ideal thin women which has emerged due to influence of media and environmental factors, and the associated body dissatisfactions, has been shown to be one of most important factors in eating disorders. The thin-ideal model, usually depicted in the media, represents an inappropriate standard of thinness, which is usually characterized by the fact that women are below 15% of their average weight and have a long lengths, narrow hips, long and thin legs. In this context, it has been suggested that this image contributes to the increase of existing eating disorders, with the community focusing tendency on the diet (101). Differences in physical appearance standards between individuals and cultures cause differentiate eating behaviors and may lead to an increase in the prevalence of eating disorders. Also, there is a high risk of eating disorders in occupational groups such as dancers, ballerinas, models and gymnasts where body image is at the forefront (102).



In the literature, when the ethiological factors of eating disorders are examined, it was emphasized that impact of socio-cultural factors should be taken into consideration since eating disorders are not uniform in every culture (103). Also it is suggested that the incidence of eating disorder is directly related to the socio-economic level. It is reported that eating disorders are more common in people which has high income. However, there are also findings that eating disorders spread across all social classes (104).

When the incidence of eating disorders is examined, it is observed that it starts in adolescence typically, and the incidence is rare in middle age. In addition the incidence of Anorexia Nervosa is 1%, while this rate is between 1% and 4.2% in Bulimia Nervosa (105). Population-based studies suggest that the prevalence of binge eating disorder is between 7% and 3% in the population (106).

According to Corson and Anderson (2002), some suggestion such as the perception of eating disorders as women's health problems, gender bias in diagnostic criteria (ex. Menstruation) and the perception of clinicians', binge eating as perceived only as an excess of appetite of men, it makes difficult to diagnose eating disorders. American Psychiatric Association was reported that 40% of the AN cases were in the 15-19 age range and the incidence of AN was increase in this group. Also BN cases occur in the late adolescence and before 25 age (107,108). American College Health Association's National College Health Assessment (ACHA-NCHA) reports that 3% of females and 0.4% of males ever receiving a diagnosis of AN; 2% of females and 0.2% of males have received a previous diagnosis of bulimia; and 4% of females and 1% of males reported the shows compensatory behaviour to lose weight in the last 30 days (109).

When the ethnic factors for eating disorders are examined; white females were found to be at higher risk than other ethnic groups. In addition, it is suggested that white adults have higher lifetime prevalence for eating disorders including AN, BN, BED (110).

It has been shown that the incidence of eating disorders increased after 1970's, because of increased social pressures for women to have thin body with media and magazine, improvements in the diagnosis and evaluation of the disease, social awareness and increase in the number of treatment apply (111).

### **2.2.6. Treatment of Eating Disorders**

Treatment of eating disorders includes, behavioral, medical and psychological aspects. Weight management is the main goal of initial treatment. For example typically for patients with AN treatment can be norm because of they believe diet is justified and this condition leads to resistance weight gain (112).

The fact that most people with ED can not receive treatment for their disorder that this refers treatment gap. It is though that only 23% of patients receive treatment with diagsonable ED (113). Supporting evidence and observed treatment effects from randomized controlled trials were complied; in a study examining the empirical status of the treatments recommended for individuals with eating disorder; the efficacy of medication and psychological treatments for AN, BN and BED patients were investigated. In this context, the use of antidepressants in the acute treatment of BN, appetite suppressant in the treatment of BED has been reported to have some beneficial effects. In the same review; family-based therapies were found to be moderate effective for adolescent AN patients, while Cognitive Behavioral Therapies were reported to have strong benefical effects on BN, moderately beneficial effects on BED (74). The main factor that determines the succes of eating disorders is the correction of the body perception of the patient. Especially anorectic individuals whose body perception is not corrected, cannot adopt the new body eright after the completion of the treatment and may enter a much faster weight loss process (114).

According to American Dietetic association, the treatment of eating disorders with psychological, behavioral and physiological components requires a cooperative approach by an interdisciplinary team of psychological, nutrition and medical specialists. In this context, the dietician contributes to the treatment process through the implementation of nutritional assessment, recommendations and supportive intervention, and also communicates the results to the other members of the team (115).

### **2.3. The Relationship Between Dieting and Eating Disorder**

Although the diet phenomenon generally includes healthy weight loss processes, many individuals think “dieting” refers unhealthy weight-control behaviors such as fasting, skipping meals, and eliminating food groups. Results from one

population-based study indicate that 58% of young girls and 75% of the women indicated that they had been on a diet (116).

When the relationship between sex differences and frequency of dieting is examined, it is determined that women have more frequently dieted than men. The BMI factor also affects the dietary behaviors of both sexes. It is also thought women tend to show more unhealthy diet behavior than men. In this case, cultural and ideal body pressure on women are effective (117). In a study to determine whether dieting causes binge eating disorder and mood disturbance in 123 obese women, Although during the first 20 week, there are no significant differences among different diet, At week 28, significantly more cases of binge eating were observed in receive rigid diet that include liquid meal and contain 1000 kcal/day (118). It has been reported that Chronic Dieters which continuous diet without and success/failure, restricting calorie for 2 years or longer; more meaning than their body weight and shape and in these individuals, cases negative body image, potential depression, social anxiety and eating disorders can be increased with common diet practices (119). Current studies shows that frequent dieting and associated unhealthy eating behaviors remain important risk in adolescent (120-122). 10-year Longitudinal Study which aims to examine the prevalence of diet, unhealthy weight control and eating behavior from young adulthood to adolescence, it was reported that about  $\frac{1}{2}$  of girls had diet in the past year as compared to about a  $\frac{1}{4}$  of the boys. Also among boys, the prevalence of dieting significantly increase in the older cohort as participants progressed from middle adolescence to middle young adulthood (21.9% to 27.9%) . After all binge eating was increase in older cohorts of both girls and boys. Among girls and boys, the prevalence was increase from 9.9% girls and 3.0% boys during middle adolescence to 14.1% girls , 5.9%boys in middle young adulthood respectively. Another study which examined that frequent dieting negative psychosocial behavior, eating disorder, body image and purging behavior in 33.393 adolescent. At the result of study, 12% of female participants and 2.2 males reported that they were dieting more than 10 times in one year” while 38% of female, 79% of males states that “never” dieted. Binge eating and fears of being unable to stop eating view about seven times more prevalent in frequent dieters compared with never dieters. Another study was reported women reported dieting more frequently than man. Also higher Blumia scores were reported in men with more frequent dieting and overweight

cases. In addition it was reported that decreases in disordered eating were associated with decreases in putative risk factors (dieting and body image) in women while increases dieting frequency and weight perception were associated with increase in drive for thinness observed in men.

The study which examined causal links between diet frequency and health, age of onset of dieting, almost half of the women reported that they has dieted to lose weight within the last year and 12.2% of this reported that they had five or more times dieted. Also there was a significant association between dieting and BMI. While 48.2% of those who show binge eating behavior are dieting 5 or more times within 1 year, 2.7% of those showed purification behavior (vomiting,using laxative and diuretic) reported never dieted, 33.7% had dieted 5 or more times and 70% of those who show weight dissatisfaction had dieted 5 or more times in last year.In this study, the relationship between the age of onset of diet and eating disorder and body dissatisfaction, 35.1% of participants showing binge eating behavior and 51.1% of participants feel weight dissatisfaction dieting onset before 15 years (123).

### **3.MATERIALS AND METHODS**

#### **3.1. Participants**

The research was carried out with 202 volunteer participants who were admitted to Bezmialem Foundation University Dragos Hospital Nutrition and Dietetics Clinic between December 2017 and May 2018. Pregnant and lactating women, individuals with any chronic disease and individuals older than 65 and below than 18 of age were not included in the research.

In the research, after the voluntary consent form was filled in by face-to-face interviews with the participants a questionnaire including age, gender, height, weight, previous obesity/overweight status and the frequency of previous dietary experiences according to years and Eating Attitude Test (EAT)-40 (Appx 1).

Eating Attitudes Test (EAT-40) which is use for a measure of disordered eating attitudes and behaviors towards body weight control and it was developed by Garner & Garfinkel (1979) as a purpose and valid index of symptoms usually observed Anorexia Nervosa. Now used a secreening tool for undifferentiated eating disorders in high risk population. The validity and reliability study of this test was modified by Savaşır and Erol (1989) to suit the Turkish. The test has been widely used in several studies in Turkey.

The EAT-40 is a self-administrated questionnaire and contains 40 question that presented in a 6-point Likert Scale that ranges from “never” to “always”. The answers to items 1,18,19,23,27 and 39 are evaluated as sometimes: 1 point, hardly ecer: 2 points, never: 3 points and the other choices: 0 point. The answer the remained questions are evaluated as always: 3 points, very often: 2 points, often: 1 point and the other choices: 0 point. In the cut-off points of the scale is 30 point. A score of 30 or above identify individuals with eating disorders. The total score is directly related to the level of psychopathology.

According to obtained data, Body Mass Index was calculated by dividing the weight (kg) by the height (m) squared and subjects classified into groups according to classification of World Health Organization.

### **3.2. Statistical Analysis**

SPSS Windows version 2.4 package program was used for statistical analysis and  $P < 0.05$  was considered statistically significant. The relationships between categorical variables were tested with Chi-Square Tests and Bonferroni correction was used the ratios for Chi-Square Tests. Cronbach alpha coefficients were calculated to test validity and reliability. Mean $\pm$ standart deviation for numeric as descriptive statics, for categorical variables, numbers and % values are given.

### **3.3. Ethics**

The research was conducted Bezmialem Foundation University Dragos Hospital. Approval of Clinical Research Ethics Comittee of Bezmialem Foundation University on number: 54022451-050.05.04 and dated 05.12.2017 (Appx 2).

#### 4. RESULTS

The age variables of 202 participants were between 18 and 60 years old (mean age  $32,78 \pm 9,31$ ) and 39 men (19.3%) and 163 women (80,7%) participated in the study. Also, 30.7% participants were found in obese, 36.1% participants were overweight while 31.2% were in normal BMI range (mean  $27,9 \pm 5,78$ ). Cronbach Alpha value of EAT 40 was obtained as 0.761 and mean value of EAT-40 score was founded that  $20,67 (\pm 10,12)$ . (Table 4.1)

**Table 4.1:** Distribution of Age, Height, Weight, BMI variables and Eat-40 scores

	N	Min	Max	Mean	Std. Deviation
Age	202	18,00	60,00	32,78	9,31
Height	202	150,00	189,00	166,84	8,68
Weight	202	47,00	167,00	77,95	18,48
BMI	202	17,36	47,25	27,93	5,78
EAT 40 Scale score	202	3,00	56,00	20,67	10,12

Table 4.2 shows obesity/overweight history and current BMI classification of the participants. When participants were analyzed according to previous and now obesity/overweight status, 155 (76.7%) and 156 (77.2%) respectively declared that in preschool and school age they were not obese/overweight while 46% participants declared that they were obese/overweight in adolescence. Also 152 participants (75.2%) stated that they are obese/overweight in adulthood.

**Table 4.2.** Obesity/overweight history and current BMI classification

		Number	%
<b>Obesity/overweight history in preschool period</b>	YES	34	16,8
	NO	155	76,7
	I can't remember	13	6,4
<b>Obesity/overweight history in school period</b>	Yes	44	21,8
	NO	156	77,2
	I can't remember	2	1,0
<b>Obesity/overweight history in adolescence</b>	Yes	93	46,0
	NO	109	54,0
<b>Obesity/overweight in adulthood</b>	Yes	152	75,2
	NO	50	24,8
<b>With BMI classification</b>	Underweight	4	2,0
	Normal range	63	31,2
	Overweight	73	36,1
	Obese	62	30,7

In the study examined that diet frequency of participants (Table 4.3) ; 43.6% (n=88) of participants indicated that they had been dieted 1 or 2 times in the last 6 months, and 7,4% (n=15) indicated that they had 10 or more times diet. 31.2% (n=63) of participants indicated that they had any dieted in the last year while 23,8% (n=48) of indicated that they had 3-10 times diet. 27.2% of participants did not have any diet in the last 3 year while 19.3% (n=39) of participants stated that they have done 10 times or “as much as i can remember dieted” in the last 3 years. When subjects were analyzed according to diet frequency in the last 5 years, it is founded that 22.3% of participants had not any diet, 26,2% of participants 1 or 2 times they had diet, 20,3% of participants 3 or 10 times they had diet and 31.2% (n=63) of participants indicated that they have as much as they can't remember diet.

In the study, mean of EAT-40 scale scores was 20.67 ( $\pm 10.12$ ). When the cut-off point of the scale was considered to be 30, according scale scoring, it was founded that 49 (24,3%) of participants showed high risk for developing eating disorder or exhibited abnormal eating attitude. And also it was founded that 153 participants showed low risk for developing eating disorder or was normal eating behavior.



**Table 4.3.** Categorical variables

		Number	%
<b>EAT-40 scale categories</b>	Normal	153	75,7
	Impaired eating attitude	49	24,3
<b>Dietary Frequency in last 6 months</b>	Never	67	33,2
	“1 or 2 times”	88	43,6
	“3-10 times”	32	15,8
	“ 10 times” and “ as much as i can’t remember”	15	7,4
<b>Dietary Frequency in last year</b>	“Never”	63	31,2
	“1 or 2 times”	65	32,2
	“3-10 times”	48	23,8
	“ 10 times” and “ as much as i can’t remember”	26	12,9
<b>Dietary frequency in last 3 years</b>	“Never”	55	27,2
	“1 or 2 times”	55	27,2
	“3-10 times”	53	26,2
	“ 10 times” and “ as much as i can’t remember”	39	19,3
<b>Dietary Frequency in last 5 years</b>	“Never”	45	22,3
	“1 or 2 times”	53	26,2
	“3-10 times”	41	20,3
	“ 10 times” and “ as much as i can’t remember”	63	31,2

When the subjects were analyzed according to relationship between gender and EAT-40 scores (Table 4.4), no significant relationship was found gender and EAT-40 scale categories. Also it was founded that there was no significant relationship between BMI classification and EAT-40 scales scores. However in the study it was founded that, 28.6% of those with impaired eating attitude indicated that they has obesity/overweight history in preschool period. Thus Obesity/overweight history in preschool period was significantly higher in participants that impaired eating attitude ( $p=0.012$ ). No significant relationship was found between school age, adolescence and adulthood obesity/overweight history and the eating attitude scores.

**Table 4.4:** Evaluation of relationships between gender, obesity/overweight history and EAT-40 scale score

		Impaired Eating Attitude (n=49)	Normal (n=153)	Chi Square	P
<b>Gender</b>	Man	6 (12,2)	33 (21,6)	2,071	0,150
	Woman	43 (87,8)	120 (78,4)		
<b>Obesity/ overweight History in Pre-school Period</b>	No	14 (28,6)	20 (13,1)	7,126	0,028*
	Yes	31 (63,3)	124 (81)		
	I can't remember	4 (8,2)	9 (5,9)		
<b>Obesity/ overweight History in school period</b>	No	12 (25)	32 (21,1)	0,331	0,565
	Yes	36 (75)	120 (78,9)		
<b>Obesity/ overweight History in adolescence</b>	No	26 (53,1)	67 (43,8)	1,284	0,257
	Yes	23 (46,9)	86 (56,2)		
<b>Obesity/ overweight in adulthood</b>	No	35 (71,4)	117 (76,5)	0,507	0,477
	Yes	14 (28,6)	36 (23,5)		

\*Significant at 0.05 level; Chi-square tests

In this study relationship between dietary frequency and EAT-40 scores was analyzed. According to hypothesis of this study, subjects with high frequency dieted, they have more disordered eating behaviors (Table 4.5)

When the participants are analyzed in relationship between dietary frequency in the last 6 months and scale scores, the ratio of those who did not make any diet in the normal group was significantly higher ( $p=0.001$ ) while the rate of those who had diet in 3-10 times was significantly higher in the group with impaired eating attitude group ( $p=0.001$ ). Also the rate of those who had diet as much as they can remember was significantly higher in the group with impaired eating attitude ( $p=0.006$ ). Therefore it was founded that there are significant relationship between dietary frequency in the last 6 months and scale scores ( $p=0.001$ ). There was a significant relationship between the frequency of diet in the last 1 year and scale scores ( $p=0.001$ ). When Benferroni Correction in percentages compared to itself, it was founded that the rate of those who did not have any diet was significantly higher in

the normal group ( $p=0.001$ ) and the rate of those who dieted 3-10 times was higher in those with impaired eating attitude group ( $p=0.039$ ).

There was a significant relationship between the frequency of diet in the last 3 years and scale scores ( $p=0.001$ ). When Benferroni Correction in percentages compared to itself, it was founded that the rate of those did not have any diet ( $p=0.001$ ) or the rate of those dieted 1-2 times ( $p=0.002$ ) significantly higher in the normal eating attitude group, the rate of those dieted “as much as i can’t remember” significantly higher in impaired eating attitude group ( $p=0.001$ ). There was a significant relationship between the frequency of diet in the last 5 years and scale scores ( $p=0.001$ ). When Benferroni Correction in percentages compared to itself, it was founded that the rate of those did not have any diet ( $p=0.001$ ) or the rate of those dieted 1-2 times ( $p=0.001$ ) or dieted 3-10 times significantly higher in the normal group ( $p=0.044$ ) this results can support study’s hypothesis also the rate of those dieted 10 times and dieted “as much as i can’t remember” significantly higher in Impaired Eating Attitude group.

**Table 4.5.** Evaluation of relationships between scale categories and diet frequency

		Impaired Eating Attitude (n=49)	Normal (n=153)	Chi-square Tests	P
Dietary frequency in last 6 months	“Never”	5 (10,2)	62 (40,5)	28,842	0,001*
	“1 or 2 times”	20 (40,8)	68 (44,4)		
	“3-10 times”	16 (32,7)	16 (10,5)		
	“as much as i can’t remember”	8 (16,3)	7 (4,6)		
Dietary frequency in last year	“Never ”	2 (4,1)	61 (39,9)	43,071	0,001*
	“1 or 2 times”	13 (26,5)	52 (34)		
	“3-10 times”	17 (34,7)	31 (20,3)		
	“ as much as i can’t remember”	17 (34,7)	9 (5,9)		
Dietary frequency in last 3 years	“Never”	0 (0)	55 (35,9)	83,510	0,001*
	“ 1 or 2 times”	5 (10,2)	50 (32,7)		
	“3-10 times”	14 (28,6)	39 (25,5)		
	“ as much as i can’t remember”	30 (61,2)	9 (5,9)		
Dietary frequency in last 5 years	“Never”	1 (2)	44 (28,8)	71,793	0,001*
	“1 or 2 times”	4 (8,2)	49 (32)		
	“3-10 times”	5 (10,2)	36 (23,5)		
	“as much as i can’t remember”	39 (79,6)	24 (15,7)		

\*Significant at 0.05 level; Chi-square tests

When the subjects are analyzed in relationship between dietary frequency and BMI groups, there was found that significant relationship BMI and dietary frequency in last year ( $p=0.012$ ). When Benferroni Correction in percentages compared to itself, it was found that the rate of those did not have any diet, significantly higher in the underweight + Normal range groups ( $p=0.038$ ) while the rate of those dieted 1 or 2 times was found that significantly higher than both overweight ( $p=0.022$ ), obese ( $p=0.015$ ).

In the study, it was found that there was no significant relationship between BMI classification and scale score (Table 4.6)

**Table 4.6.** Evaluation of relationships between BMI classification and scale score categorization

		Impaired Eating Attitude (n=49)	Normal (n=153)	Chi-Square	p
<b>Classification of BMI</b>	Underweight	1 (2)	3 (2)	1,107	0,775
	Normal Range	14 (28,6)	49 (32)		
	Overweight	16 (32,7)	57 (37,3)		
	Obese	18 (36,7)	44 (28,8)		

\*Significant at 0.05 level; Chi-square tests

In study, there was a found that significant relationship between dietary frequency in last 6 months ( $p=0.027$ ), in last year ( $p=0.014$ ), in last 3 years ( $p=0.001$ ), in last 5 years ( $p=0.044$ ) and gender. When Benferroni Correction in percentages compared to itself, it was found that in the last 6 months; the rate of had diet 3-10 times was significantly higher in women ( $p=0.011$ ). And also, in all year intervals, proportions of men who had never diet was significantly higher in man (in the last year  $p=0.025$ , in the last 3 years  $p=0.001$ , in the last 5 years  $p=0.023$ ), while the rate of women who had diet as much as they can't remember was significantly higher in women (in the last year;  $p=0.001$ , in the last 3 years;  $p=0.013$ , in the last 5 years;  $p=0.018$ ) (Table 4.7)

**Table 4.7:** Evaluation of the relationship between Gender and Dietary Frequency

		<b>Man (n=39)</b>	<b>Woman (n=163)</b>	<b>Chi-Square</b>	<b>p</b>
<b>Dietary Frequency in last 6 months</b>	“Never”	17 (43,6)	50 (30,7)	9,160	0,027*
	“1 or 2 times”	20 (51,3)	68 (41,7)		
	“3-10 times”	1 (2,6)	31 (19)		
	“as much as i can’t remember”	1 (2,6)	14 (8,6)		
<b>Dietary Frequency in last year</b>	“Never”	18 (46,2)	45 (27,6)	10,587	0,014*
	“1 or 2 times”	14 (35,9)	51 (31,3)		
	“3-10 times”	7 (17,9)	41 (25,2)		
	“as much as i can’t remember”	0 (0)	26 (16)		
<b>Dietary Frequency in last 3 years</b>	“Never”	19 (48,7)	36 (22,1)	16,098	0,001*
	“1 or 2 times”	6 (15,4)	49 (30,1)		
	“3-10 times”	12 (30,8)	41 (25,2)		
	“as much as i can’t remember”	2 (5,1)	37 (22,7)		
<b>Dietary Frequency in last 5 years</b>	“Never”	14 (35,9)	31 (19)	8,086	0,044*
	“1 or 2 times”	10 (25,6)	43 (26,4)		
	“3-10 times”	9 (23,1)	32 (19,6)		
	“as much as i can’t remember”	6 (15,4)	57 (35)		

*\*Significant at 0.05 level; Chi-square tests*

## 5. DISCUSSION and CONCLUSION

Although EAT-40 tests was formed assess the symptoms of anorexia, it has been used in non-clinical samples and help screens measure for disordered eating attitudes (124). In this sense, we investigated the study that used to Eating attitude test in Turkey, according to Kavas et al. (126) was founded the mean of EAT-40; 19,63 ( $\pm 10,62$ ). And also in this study which 269 university students participates, 13.4% of the female and 11.3% of males had an EAT-40 score above 30. All of this according to Güneş and Çalık (127)'s %13.1 of total participants had an EAT-40 score above 30. Sanlier et. al (128)' and T. Fidan et al (129)' study the mean of EAT-40 score was founded respectively 19,63 ( $\pm 10,62$ ). and 18.3+-9.3 (n=878). Unlike this results in our study, mean value of EAT-40 score was founded that 20.67  $\pm$  10.12 while 24.3% of total participants had an EAT-40 score above 30 point.

The patient's current body weight and weight history provide diagnostic information and enable the clinicians to explore the meaning the body weight and image has for the patient. In this context the presence of obesity history, may result weight concern or disordered eating behavior. This hypothesis is supported by Marcus et al. (130) and Spurrel et al. (131)'s studies. They suggest that, early onset of overweight is significantly associated with an binge eating in overweight adults with BED. According to our results, it was founded that, 28.6% of those with impaired eating attitude indicated that they has obesity/overweight history in preschool period. The participants which had overweight or obese in preschool period was significantly higher in that impaired eating attitude group ( $p=0.012$ ). Smilarly according to Reas and Grillo (132) suggest that, early presence of overweight may have important implications for the later development of disordered eating.

In order to examine the relationship between eating attitude and BMI in the context of eating disorder; the type of ED should be considered. The diagnostic criteria of AN is contain low BMI while according to Pinagy et al. (133), Binge Eating Disorder describes overweight or obese patients who present with repeated eating of an unusually large amount of food during a short period of time. In our study there was no significant relationship between BMI and Eating Attitude Test. Smilarly, according to Sanlier et al. (128)'s study, there was no significant difference

between normal and obese individuals according to EAT-40. In contrast according to Gaddad et al. (134) BMI values were founded that to be negatively related to EAT-26 scores which shortened state of EAT-40 test ( $p=0.010$ ). They suggest that it was indicating that lower the BMI more are the chances of having disordered eating.

Although according to NHIS findings in 1985 referred that over 34.14 million men and women who frequently dieted had normal weight, as compared to 22.6 million dieters were overweight (135), numerous study suggest that, dieting among overweight patients have been more favorable (136). According to one study which was aimed to examine the effect of self-perceived weight status on dieting and unhealthy weight-control behaviors among male adolescent across weight status, it was founded that 25% of adolescent reported at least one unhealthy weight-control behaviors (20.4% underweight, 38.8% of overweight and 56.8% of obese) Almenara et al. (137) suggest that these results indicate that a high percentage of overweight and obese adolescent reported being related in dieting and unhealthy weight control behavior. Westenhoefer (138) suggest that rigid diet control behavior was engaged with higher BMI and greater eating disorder symptoms; while flexible dieting, was negatively correlated. According to Field et al (139)'s study which aimed to assess prospectively the influence mechanisms on the development of weight concerns and frequent dieting. As far as result of study concern about their weight were less prevalent among girls in the weight categories but were more strongly associated with BMI among boys. BMI was similarly associated with the development of frequent dieting. Similarly in our study, there was founded that significant relationship between BMI and dietary frequency. Also the rate of those "did not have any diet", significantly higher in the underweight+Normal age groups ( $p=0.038$ ) while the rate of those dieted 1 or 2 times was founded that significantly higher than both overweight and obese groups ( $p=0.022$ ), ( $p=0.015$ ).

A number of the epidemiological studies have affirmed the clinical opinion that the eating disorders are much more prevalent among women than among men. In our study, there was no significant differences between gender and eating disorder scale ( $p=0.150$ ) likewise Sanlier et al (128) was not found statically significant differenced in EAT-40 risk categorisation between genders ( $p= .855$ ). Hsu L. G. (140) suggest that, certain social and ethnic variables affect prevalence of eating disorders among women because many more females than males are dieting to

control their weight and shape. According to Weltzin et al. (141), men are less likely to show in bulimic behaviours and more likely to show increased physical activity for body weight control. However Jones and Morgan (142) suggested that the findings of eating disorder in males are difficult to validate due to the existing bias in diagnosis. Numerous diagnostic criteria for eating disorders are specific to the types of weight and shape concern and methods of weight control widespread to women (thin-ideal body perception, dieting), rather than men (low body fat, muscularity, exercise etc.). Therefore EAT-40 scale which was used in our study, contains some gender bias questions like "Have regular menstrual periods?". Also in our study gender distribution was not appropriate for this comparison because of male samples were 19.3% (n=39) while female samples 80.9% (n=163).

According to Moore et al (143) girls or women are more dieted and more show weight control behavior than boys or men because of weight dissatisfaction. Similarly, Prince (144) suggest that dieting and its related eating disorders have long been known to be common among young women in Western societies. According to Slof-Op't Landt et al. (5)'s study, more women than men reported dieting in each of the age categories. In the total, 7.4% of women and 1.2% of men were "often" or "always" on a diet. In parallel with these, in our study, it was found that in the last 6 months; the rate of had diet 3-10 times was significantly higher in women ( $p=0.011$ ). And also, in all year intervals, proportions of men who had never diet was significantly higher in men, while the rate of women who had too much was significantly higher in women.

Spurrell et al (131) suggest that, chronic caloric restriction indicates a significant component for overeating. They explained the mechanisms of linking dieting to binge eatings as; depressive feelings may result from dietary restriction and promote overeating and with dietary restriction increases sensitivity to food and making available food more desirable. To support these thoughts within the framework of "eating attitude"; French and Story (121) suggest that increase frequency of diet, individuals show impaired eating attitude like purging, binge eating. According to their study, fears of cannot stop eating were about 7 times more prevalent in chronic dieters compared with never dieters. Also almost half of females who dieted 10 or more times had declared that binge eating whereas only 15% of never dieters had ever binged. According to another males on less diet have been



reported to have lower Bulimia scores and in women, decreases in disordered eating were associated with decreases in putative risk factors like dieting and body image (122). Also a study they was found that, adolescent and young adults have high incidence for caloric restriction and weight control behaviors at the end of the ten years follow up. Furthermore, tendency of disordered eating behaviors raddled with dieting behavior among adolescents who make more frequent caloric restriction have higher risk for disordered eating in future (120). Smilarly according to Patton et al. Female adolescents who had diet frequently have eighteen times more vulnerable for disordered eating compared to ones who did not and moderate dieters have five times increased risk for developing eating disorder(145).

Findings from smilar study (116) which was aimed to examine associations between dieting frequency and eating disorder behaviors, indicated that, dieting frequency was associated with number of severity of eating disorder symptoms and the The Bulimia Test-Revised (BULIT-R) and all core The Eating Disorders Inventory-2 (EDI-2) subscales. Therefore dieting frequency was positively associated with symptoms of blumia. Likewise in our study, there was a significant relationship between the frequency of diet in the last year and EAT-40 scale scores and the rate of those who did not have any diet was significantly higher in the normal group, the rate of those who dieted 3-10 times was higher in those with impaired eating attitude goup ( $p=0.039$ ).

Many studies shows that dieting is associated that impaired eating attitude and frequent dieting increases eating disorders especially binge eating disorder. Acording to The National Task Force on the Prevention and Treatment of Obesity (146)'s data; dieting and weight loss in obese individuals may associated with impairment of mood such depression, anxiety etc. However Butryn and Wadden (147) suggest that this was true if treatment was fallowed by very low-calorie diet. Also they state that weight loss programs which promote with behavioral therapy may have contributed to the observed improvements in mood.

The present study had some limitations. Initially, the number of participants was less than expected. Although our findings support the hypohthesis, stronger results can be achieved with more participants. Body weight and height of the participants recorded with their statement. In addition, if the diagnosis of eating disorder was made by team include psychiatrist, it would be more appropriate to

study specific eating disorders as Binge Eating Disorder or Bulimia Nervosa. Finally, in future studies, in order to make the recommendations stronger, it is more appropriate to investigate whether individuals are applying diet by themselves or with the help of a dietician.

In conclusion, in this study was examined that eating disorder as a side effect of frequent diet. Our findings showed the positive relationship between frequent dieting and disordered eating attitude. In this context, considering the fact that nowadays the perception of thin-body image is widespread among people and it is easier for individuals to reach the “diet”, it can be thought that the incidence of impaired eating attitude will be increase. Also dietitians who are part of public health professionals, should inform individuals about side effects of frequent dieting and unhealthy dieting behavior.

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## APPENDICES

### Appx 1. Questionare

#### BİLGİLENDİRİLMİŞ GÖNÜLLÜ OLUR FORMU (BGOFO)

##### CALISMANIN ADI:

Istanbul'da Bir Hastane'nin Beslenme ve Diyet Polikliniğine Başvuran Bireylerin Yeme Davranışı Bozukluğu ile Obezite Geçmişi ve Geçmişteki Diyet Sıklığının İlişkisi

Aşağıda bilgileri yer almakta olan bir araştırma çalışmasına katılmanız istenmektedir. Çalışmaya katılıp katılmama kararı tamamen size aittir. Katılmak isteyip istemediğinize karar vermeden önce araştırmanın neden yapıldığını, bilgilerinizin nasıl kullanılacağını, çalışmanın neleri içerdiğini, olası yararları ve risklerini ya da rahatsızlık verebilecek yönlerini anlamanız önemlidir. Lütfen aşağıdaki bilgileri dikkatlice okumak için zaman ayırınız. Eğer çalışmaya katılma kararı verirseniz, **Çalışmaya Katılma Onayı Formu**'nu imzalayınız. Çalışmadan herhangi bir zamanda ayrılmakta özgürsünüz. Çalışmaya katıldığınız için size herhangi bir ödeme yapılmayacak ya da sizden herhangi bir maddi katkı/malzeme katkısı istenmeyecektir.

##### CALISMANIN KONUSU VE AMACI :

- Araştırmanın amacı bireylerin yeme davranışı bozukluğu eğilimi ile fazla kilo/obezite geçmişi ve geçmişteki zayıflama diyeti deneme sıklığının ilişkisi araştırılacaktır. Çalışmaya 380 gönüllü bireyin katılması planlanmaktadır ve tek merkezli yürütülecektir.

##### CALISMA İSLEMLERİ:

Çalışmaya katılan gönüllülere herhangi girişimsel bir işlem uygulanmayacaktır. Kan alımı veya ilaç kullanımı olmayacaktır. Gönüllülerin anket doldurması istenecek ve geçmiş diyet deneyimleri sorgulanacaktır.

##### CALISMADA YER ALMAMIN YARARLARI NELERDİR?

Araştırmada yer alarak bilime katkıda bulunulacaktır.

##### BU CALISMAYA KATILMAMIN MALİYETİ NEDİR?

Çalışmaya katılmakla parasal yük altına girmeyeceksiniz ve size de herhangi bir ödeme yapılmayacaktır.

##### CALISMAYA KATILMALI MIYIM?

Bu çalışmada yer alıp almamak tamamen size bağlıdır. Şu anda bu formu imzalarsanız bile istediğiniz herhangi bir zamanda bir neden göstermeksizin çalışmayı bırakmakta özgürsünüz. Eğer katılmak istemez iseniz veya çalışmadan ayrılırsanız, doktorunuz tarafından sizin için en uygun tedavi planı uygulanacaktır.

##### KİŞİSEL BİLGİLERİM NASIL KULLANILACAK?

Çalışmada diyetisyeniniz kişisel bilgilerinizi, araştırmayı ve istatistiksel analizleri yürütmek için kullanacaktır ancak kimlik bilgileriniz gizli tutulacaktır. Yalnızca gereği halinde, sizinle ilgili bilgileri etik kurullar ya da resmi makamlar inceleyebilir. Çalışmanın sonunda, kendi



sonuçlarınızla ilgili bilgi istemeye hakkınız vardır. Çalışma sonuçları çalışma bitiminde tıbbi literatürde yayınlanabilecektir ancak kimliğiniz açıklanmayacaktır.

**SORU VE PROBLEMLER İÇİN BASVURULACAK KİŞİLER :**

ADI : Merve Saraç  
GÖREVİ : Diyetisyen  
TELEFON : 0216 251 65 65

**CALISMAYA KATILMA ONAYI**

Yukarıdaki bilgileri ilgili araştırmacı ile ayrıntılı olarak tartıştım ve kendisi bütün sorularımı cevapladı. Bu bilgilendirilmiş olur belgesini okudum ve anladım. Bu araştırmaya katılmayı kabul ediyorum ve bu onay belgesini kendi hür irademle imzalıyorum. Bu onay, ilgili hiçbir kanun ve yönetmeliği geçersiz kılmaz. Araştırmacı, saklamam için bu belgenin bir kopyasını çalışma sırasında dikkat edeceğim noktaları da içerecek şekilde bana teslim etmiştir.

Gönüllü Adı Soyadı:		Tarih ve İmza:
Telefon:		

Araştırmacı Adı Soyadı:		Tarih ve İmza:
Telefon:		

Katılımcı No:

Boy:

Kilo:

Yaş:

Cinsiyet:

1) Yaşamınızın çeşitli evrelerinde fazla kilo/obezite sorununuz oldu mu?

		Evet	Hayır	Hatırlamıyorum
3-6 Yaş	Okul Öncesi Dönemi			
7-10	Okul Çağı			
11-17	Ergenlik Dönemi			
18-65	Yetişkinlik Dönemi			

2) Geçmiş Yaşantınızda Diyet Denemeleriniz Oldu mu?

	Son 6 Ay	Son 1 yıl	Son 3 yıl	Son 5 yıl
Yapmadım				
Hatırlamıyorum				
1 Kez				
1-2 kez				
3-5 kez				
5-10 kez				
10'dan fazla				
Hatırlamadığım kadar çok				

## YEME TUTUMU TESTİ

Bu anket sizin yeme alışkanlıklarınızla ilgilidir. Lütfen her bir soruyu dikkatlice okuyunuz ve size en uygun gelen kutu içine (X) işareti koyunuz. Örneğin "Çikolata yemek hoşuma gider" cümlesini okudunuz. Çikolata yemek hiç hoşunuza gitmiyorsa "hiçbir zaman" yazılı kutu içine (X) işareti koyunuz; her zaman hoşunuza gidiyorsa "daima"nın altını (X) ile işaretleyiniz.

	Daima	Çok sık	Sık sık	Bazen	Nadiren	Hiçbir zaman
1. Başkaları ile birlikte yemek yemekten hoşlanırım.						
2. Başkaları için yemek pişiririm, fakat pişirdiğim yemeği yemem.						
3. Yemekten önce sıkıntılı olurum.						
4. Şişmanlıktan ödüm kopar.						
5. Acıktığımda yemek yememeye çalışırım.						
6. Aklım fikrim yemektedir.						
7. Yemek yemeyi durduramadığım zamanlar oldu.						
8. Yiyeceğimi küçük küçük parçalara bölerim.						
9. Yediğim yiyeceğin kalorisini bilirim.						
10. Ekmek, patates, pirinç gibi yüksek kalorili yiyeceklerden kaçınırım.						
11. Yemeklerden sonra şişkinlik hissedirim.						
12. Ailem fazla yememi bekler.						
13. Yemek yedikten sonra kusarım.						
14. Yemek yedikten sonra aşırı suçluluk duyarım.						
15. Tek düşüncem daha zayıf olmaktır.						
16. Aldığım kalorileri yakmak için yorulana kadar egzersiz yaparım.						

	Daima	Çok sık	Sık sık	Bazen	Nadiren	Hiçbir zaman
17. Günde birkaç kez tartılırım.						
18. Vücudumu saran dar elbiselerden hoşlanırım.						
19. Et yemekten hoşlanırım.						
20. Sabahları erken uyanırım.						
21. Günlerce ayrı yemeği yerim.						
22. Egzersiz yaptığımda harcadığım kalorileri hesaplarım.						

	Daima	Çok sık	Sık sık	Bazen	Nadiren	Hiçbir zaman
23. Adetlerim düzenlidir.						
24. Başkaları zayıf olduğumu düşünür.						
25. Şişmanlayacağım (vücudumun yağ toplayacağı) düşüncesi zihnimi meşgul eder						
26. Yemeklerimi yemek başkalarınınkinden uzun sürer.						
27. Lokantada yemek yemeyi severim.						
28. Müshil kullanırım.						
29. Şekerli yiyeceklerden kaçınırım.						
30. Diyet (perhiz) yemekleri yerim.						
31. Yaşamımı yiyeceğin kontrol ettiğini düşünürüm.						
32. Yiyecek konusunda kendimi denetleyebilirim.						
33. Yemek konusunda başkalarının bana baskı yaptığını düşünürüm.						
34. Yiyeceklerle ilgili düşünceler çok zamanımı alır.						
35. Kabızlıktan yakınırım.						

	Daima	Çok sık	Sık sık	Bazen	Nadiren	Hiçbir zaman
36. Tıllı yedikten sonra rahatsız olurum.						
37. Perhiz yaparım.						
38. Midemin boş olmasından hoşlanırım.						
39. Şekerli, yağlı yiyecekleri denemekten hoşlanırım.						
40. Yemeklerden sonra içimden kusmak gelir.						

## Appx 2. Ethical Approval

### BEZMİALEM VAKIF ÜNİVERSİTESİ GİRİŞİMSEL OLMAYAN KLİNİK ARAŞTIRMALAR ETİK KURULU (2011-KAEK-42) KARAR FORMU

ARAŞTIRMANIN AÇIK ADI	Istanbul'da Bir Hastane'nin Beslenme ve Diyet Polikliniğine Başvuran Bireylerin Yeme Davranışı Bozukluğu ile Obezite Geçmişi ve Geçmişteki Diyet Sıklığının İlişkisi
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BEZMİALEM VAKIF ÜNİVERSİTESİ GİRİŞİMSEL OLMAYAN KLİNİK ARAŞTIRMALAR ETİK KURULU	
ETİK KURULUN ÇALIŞMA ESASI	İlaç ve Biyolojik Ürünlerin Klinik Araştırmaları Hakkında Yönetmelik, İyi Klinik Uygulamaları Kılavuzu
BAŞKANIN UNVANI / ADI / SOYADI:	Prof. Dr. İsmail MERAL

Unvanı/Adı/Soyadı	Uzmanlık Alanı	Kurumu	Araştırma ile ilişki		Katılım *		İmza
			E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Prof. Dr. İsmail MERAL	Fizyoloji	Bezmialem Vakıf Üniversitesi Tıp Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Prof. Dr. Ömer SOYSAL	Göğüs Cerrahisi	Bezmialem Vakıf Üniversitesi Tıp Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Prof. Dr. Nuran YILDIRIM	Tıp Tarihi ve Etik	Bezmialem Vakıf Üniversitesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Prof. Dr. Türkinaz AŞTI	Hemşirelik Bölümü	Bezmialem Vakıf Üniversitesi Sağlık Bilimleri Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	
Prof. Dr. Semra ÖZÇELİK	Tıp Eğitimi ve Bilişimi	Bezmialem Vakıf Üniversitesi Tıp Fakültesi	E <input type="checkbox"/>	H <input type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Prof. Dr. Teoman AYDIN	Fiziksel Tıp ve Rehabilitasyon	Bezmialem Vakıf Üniversitesi Tıp Fakültesi	E <input type="checkbox"/>	H <input type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Doç. Dr. Fahri AKBAŞ	Tıbbi Biyoloji	Bezmialem Vakıf Üniversitesi Tıp Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Doç. Dr. Binnur AYDOĞAN TEMEL	Eczacılık	Bezmialem Vakıf Üniversitesi Eczacılık Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Doç. Dr. Aclan ÖZDER	Aile Hekimliği	Bezmialem Vakıf Üniversitesi Tıp Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Doç. Dr. Mustafa TUNALI	Periodontoloji	Bezmialem Vakıf Üniversitesi Diş Hekimliği Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Yrd. Doç. Dr. Nur BÜYÜKPINARBAŞILI	Tıbbi Patoloji	Bezmialem Vakıf Üniversitesi Tıp Fakültesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Av. Mustafa Fırat ALKAYA	Hukuk	Bezmialem Vakıf Üniversitesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input checked="" type="checkbox"/>	H <input type="checkbox"/>	
Eda BAYRAKTAR	Sivil Üye	Bezmialem Vakıf Üniversitesi	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	E <input type="checkbox"/>	H <input checked="" type="checkbox"/>	

\* :Toplantıda Bulunma

**Karar:**  Onaylandı  Reddedildi

Sayfa 2 / 2

Etik Kurul Başkanı  
Prof. Dr. İsmail MERAL

## CIRRUCULUM VITAE

<b>Adı</b>	Merve	<b>Soyadı</b>	Saraç Dengizek
<b>Doğum Yeri</b>	Şanlıurfa	<b>Doğum Tarihi</b>	23.05.1992
<b>Uyruğu</b>	T.C	<b>TC Kimlik No</b>	30695395976
<b>E-mail</b>	info@diyetisyenmerve.net	<b>Tel</b>	05057218200

### Öğrenim Durumu

Derece	Alan	Mezun Olduğu Kurumun Adı	Mezuniyet Yılı
<b>Doktora</b>	-	-	-
<b>Yüksek Lisans</b>	Beslenme ve Diyetetik	<b>Yeditepe Üniversitesi</b>	2019
<b>Lisans</b>	Beslenme ve Diyetetik	<b>Yeditepe Üniversitesi</b>	2016
<b>Lise</b>	-	<b>Şanlıurfa Anadolu Lisesi</b>	

Bildiği Yabancı Dilleri	
İngilizce	İleri
İspanyolca	Başlangıç

### İş Deneyimi (Sondan geçmişe doğru sıralayın)

Görevi	Kurum	Süre (Yıl - Yıl)
Diyetisyen	Merve Saraç Dengizek Beslenme ve Diyet Merkezi	2019
Diyetisyen	Bezmialem Vakıf Üniversitesi Dragos Hastanesi	2017-2018
Diyetisyen	360 Fit Zayıflama Merkezi	2017-2017

### Bilgisayar Bilgisi

Program	Kullanma becerisi
Microsoft Office Word, Excell, Powerpoint Outlook	Çok iyi
Bebis	Orta

### Diğer (Görev Aldığı Projeler/Sertifikaları/Ödülleri)

Tip I Diyabette Beslenme ve Karbonhidrat Sayımı Kursu- Okan Üniversitesi- Kasım 2017
Metabolik ve Bariatrik Cerrahi Diyetisyenliği Kursu Metabolik ve Bariatrik Cerrahi Diyetisyenliği Derneği- Kasım-2017
Yeme Bozukluğu Diyetisyenliği Kursu- Acıbadem Üniversitesi – Şubat 2015
Hastalıklarda Diyet Tedavisinin Klinik Uygulamalara Yansımaları Sempozyumu II. Gülhane Askeri Tıp Akademisi- Ankara – Kasım 2014
Modern Yaşamda Beslenme Alışkanlıkları ve Dijital Dünyada Diyetisyenlik Semineri- Acıbadem Üniversitesi – Mart 2014