



T.C. YEDİTEPE UNIVERSITY

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**COMPARISON OF EATING DISORDERS STATUS
BETWEEN FIRST AND FOURTH YEAR OF NUTRITION AND
DIETETICS STUDENTS IN A PRIVATE UNIVERSITY IN
İSTANBUL**

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ÖZET

Dumlu G., İstanbul'da Özel Bir Üniversitede Eğitim Görmekte Olan 1. ve 4. Sınıf Beslenme ve Diyetetik Öğrencilerinin Yeme Tutumlarının Karşılaştırılması. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Anabilim Dalı Yüksek Lisans Tezi, İstanbul, 2015.

Beslenme sağlığın korunması ve geliştirilmesi için gerekli besinlerin yeterli ve dengeli bir şekilde vücuda alınmasıdır. Bireylerin gereksinimleri, alışkanlıkları, aile ve sosyal çevreleri düşünüldüğünde birçok faktörden etkilenebilen bir konu olan beslenme kişilerin yaş gruplarına göre de farklılık ve çeşitlilik göstermektedir. Günümüzde sağlıklı beslenme algısının sürekli vurgulanmasının yanı sıra sosyal baskı ve medyanın etkisiyle bir değer ölçüsü olmaya başlayan “ince beden” algısı son dönemlerde dikkat çekmeye başlamaktadır. Gelişmiş ve Batı kültürünün etkisinde olan toplumlarda giderek artış gösteren bu durum özellikle üniversite öğrencilerini yakından ilgilendirmektedir. Yeni bir sosyal ortama dahil olmak, değişen yeme davranışları, sosyal medya ve kültürel ortamda kilo konusunun odak noktası haline gelmesi bireylerin bu dönemde yeme davranışı bozuklukları geliştirmesine zemin hazırlamaktadır.

Üniversite öğrencileri kendi içlerinde okudukları bölümlere göre karşılaştırıldıklarında yapılan bazı çalışmalar özellikle beslenme ve diyetetik bölümünde okuyan öğrencilerin besin, kilo kontrolü, vücut kompozisyonu gibi konularda artmış bilgi düzeyine bağlı olarak yeme bozukluğu geliştirmesi açısından daha riskli bir grupta olabileceğini göstermiştir^[1].

Bu çalışmanın amacı; beslenme ve diyetetik öğrencilerinin yeme tutumlarının belirlenmesi, bu bölümde okuyan birinci ve dördüncü sınıf öğrencilerin yeme bozukluğu durumunu saptanması ve kendi içlerinde karşılaştırılmasıdır. Araştırmaya Eylül 2013 ve 2014 eğitim öğretim yıllarında okuyan 202 beslenme öğrencisi katılmıştır. Ankete katılan tüm katılımcılar gönüllü olarak katılmış ve isimleri gizli tutulmuştur. Öğrencilerden kilo (kg) ve boy (cm) gibi antropometrik ölçümler alınmış ve bu parametreler kullanılarak öğrencilerin beden kitle indeks

değerleri hesaplanmıştır. Yeme bozukluğu durumunu saptamak amacıyla Yeme Tutum Testi-40 (YTT-40) testi uygulanmıştır.

Çalışmadan elde edilen verilere göre 179 beslenme ve diyetetik öğrencisinde (%88.6) yeme davranışı bozukluğu saptanmazken; 6 öğrencide (%3) bozulmuş yeme davranışı, 17 öğrencide ise (%8.4) orta derecede yeme bozukluğu geliştirme riski saptanmıştır.

Öğrenciler kendi içlerinde okudukları sınıflara göre karşılaştırıldıklarında, 1.sınıfta okuyan öğrencilerin%3,3'ünde yeme bozukluğu davranışı, %9.1'inde orta derecede yeme davranışı bozukluğu geliştirme riski; 4. sınıfta okuyan öğrencilerin ise %2.5'inde yeme bozukluğu davranışı, %7.4'ünde orta derecede yeme davranışı bozukluğu geliştirme riski saptanmıştır. Öğrencilerin sınıfları ve yeme bozukluğu davranışları arasında saptanan bu fark istatistiksel olarak anlamlı bulunmamıştır. ($p>0,05$)

Anahtar Sözcükler; Yeme bozuklukları, Beslenme ve Diyetetik, Yeme Tutum Testi-40

ABSTRACT

Dumlu G., Comparison of Eating Disorders Status Between First and Fourth Year of Nutrition and Dietetics Students in a Private University in Istanbul, Yeditepe University Institute of Health Sciences, Nutrition and Dietetics Department, Master of Science Thesis, İstanbul, 2015.

Nutrition is balanced and adequate food intake to ensure protection and development of health. When individuals' requirements, habits, family and social environments are evaluated, nutrition is multi factorial issue which shows alterations and diversity according to age groups. Nowadays, although healthy eating perceptions are frequently emphasized, "thin body perception" which are affected by social pressure and media" also begins significantly important for last years. This condition which increase in developed societies and some societies influenced by Western culture interest particularly university students. Involvement in new social environment, changing of eating habits, becoming "weight subject" as focus in social media and cultural environment induce development of eating disorders.

When the university students compare according to their department, some studies suggest that nutrition and dietetics students can be in highly risk group for development of eating disorder because of their enhanced knowledge status about "food", "weight control" and "body composition"^[1].

The aim of this study is determination and comparison of eating disorders status between first and fourth year of nutrition and dietetics students. Two hundred two nutrition and dietetics students were recruited from a private university, in İstanbul. The survey was conducted between September 2013 and 2014. All participation was voluntary and protected by not using names. Anthropometric measurements such as weight (kg) and height (cm) were obtained from all participants and these parameters were used for calculation of body mass index (BMI) and Eating Attitudes Test -40 (EAT-40) was applied for determination of eating disorder status.

According to data obtained from this study, while 179 of nutrition and dietetics students (88.6%) did not have eating disorder, 6 of students (3%) have eating disorder and 17 of students (8.4%) have moderate risk for development of eating disorder.

When students are compared according to their class, first year of nutrition and dietetics students exhibited that 3.3% of them had eating disorder behavior and 9.1% students had moderate risk for development for eating disorder; fourth year of the students demonstrated that 2.5% of them had eating disorder behavior and 7.4% of the students had moderate risk for abnormal eating behavior. The difference between classes and eating disorder behaviors of students was not found statistically significant. ($p>0.05$)

Key Words: Eating Disorders, Nutrition and Dietetics, EAT-40

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ABBREVIATIONS

| | |
|--------------------|---|
| AN | : Anorexia Nervosa |
| BED | : Binge Eating Disorder |
| BMI | : Body Mass Index |
| BN | : Bulimia Nervosa |
| Cm | : Centimeter |
| DN Students | : Dietetics or Nutrition Students |
| DSM-IV-TR | : The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision |
| EAT-40 | : Eating Attitudes Test-40 |
| ED | : Eating Disorders |
| EDNOS | : Eating Disorders Not Otherwise Specified |
| FAED | : Food Avoidance Emotional Disorder |
| Kg | : Kilogram |
| SED | : Selective Eating Disorder |
| SPSS | : Statistical Packages for Social Science |
| WHO | : World Health Organization |

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1.INTRODUCTION

Eating disorders are major public health problems among adolescent because of their high prevalence and their potentially serious physical and psychosocial outcomes. They are correlated with a high level of morbidity and burden of disease and with high levels of mortality ^[2]. Biological, psychological and cultural factors and eating habits are very important in the etiology of eating disorders, which are usually seen in middle socioeconomic levels and in industrialized and developed societies where attractiveness is associated with thinness ^[3].

They have been extensively reported upon in Western countries, and it is considered common for female college students to report dissatisfaction with their body image. Globally female students have been reported to use weight control methods, such as dieting, medications, and purging to lose weight when attending university ^[4]. In a study which aimed to examine the eating attitudes and psychological characteristics of Turkish late adolescents conducted among 783 university students in Turkey, abnormal eating habits were determined among 13.1% of the females and 9.2 % of the males ^[5].

Several studies suggest that eating disorders or the risk for disordered eating behavior are more prevalent in dietetics or nutrition students when compared with students from other courses. Even considering data indicating that students of nutrition and dietetics present a higher prevalence of eating disorder behavior, the causal relationship still remains uncertain. While some authors suggest that the selection of a nutrition or dietetics course is influenced by own personal experiences regarding food and weight control, others suggest that the contact with food issues and the belief that a good appearance will be important for future professional success may be favorable to a higher incidence of eating disorders in nutrition students^[6].

A cross-sectional German study in 2009 which compare eating behavior of nutrition students (n=219) and other study programmes (n=114) identified that nutrition students showed higher levels of dietary restraint than the control group. Results of the study from Brazil in 2009 showed that DN students have high prevalence of ED symptoms ^[1].



2.LITERATURE REVIEW

2.1. Definition of Eating Disorders

Eating disorders are complex psychiatric syndromes in which cognitive distortions related to food and body weight and disturbed eating patterns can lead to serious and potentially life threatening medical, nutrition and social complications^{[7][8]}.

No consensus has yet been achieved on the definition of eating disorders, but three main characteristics have been proposed as necessary to define them: 1) A definite disturbance of eating habits or weight control behavior; 2) Either the behavior disturbances, or associated core eating disorder features (i.e., the disturbance of eating and any associated over-evaluation of shape or weigh), results in a clinically significant impairment of physical health or psychosocial functioning; 3) The behavioral disturbance should not be secondary to any general medical disorder or to any other psychiatric condition^[9].

According to the National Institute of Health, an eating disorder is an illness that causes critical disturbances to individual's everyday diet, such as extreme reduction of food intake or extreme overeating, or feelings of extreme distress or concern about body weight or image^[10].

They are often long term, chronic recurring conditions which have appreciable short and long term effects on the health, relationships, employment, fertility and family life of affected individuals^[11].They are spectrum of serious maladaptive eating behaviors characterized by highly restrictive and unhealthy food intake patterns that not only lead to plethora of physiological and health complications but also lead to different psychiatric conditions such as depression, anxiety and personality disorders^[12].

A constant focus on dieting, food and exercise, insisting on having different meals from the rest of the family, feeling stressed when unable to exercise, increasing social withdrawal, frequent weighing, and frequent visits to the bathroom after meals which are early warning signs for determination of eating disorder^[13].

2.2. Epidemiology of Eating Disorders

Eating disorders are a significant public health problem for individuals across the life span. Currently it is estimated that approximately 5 million Americans have a diagnosable eating disorder ^[14].

Eating disorders and related behaviors are common in young people ^[15]. More than 75% of eating disorder cases begin during adolescence ^[7] but some reports indicate that they can develop during childhood or later in adulthood. Investigators of a study of a large sample of American children aged 9–14 years reported that 7.1% of boys and 13.4% of girls displayed disordered eating behaviors ^[16].

Women and girls are much more likely than males to develop an eating disorder. For young females, eating disorders represent the third most common chronic illness and the second leading cause of mental disorder in Australia ^[17]. Men and boys account for an estimated 5 to 15 percent of patients with anorexia or bulimia and an estimated 35 percent of those with binge-eating disorder ^[18].

Eating disorders have been reported worldwide both in developed regions and emerging economies such as Brazil and China. The lifetime prevalence of eating disorders in adults is about 0.6% for anorexia nervosa, 1% for bulimia nervosa, and 3% for binge eating disorder. Women are more affected than are men, and the sex differences in lifetime prevalence in adults could be less substantial than that quoted in standard texts: 0.9% for anorexia nervosa, 1.5% for bulimia nervosa, and 3.5% for binge eating disorder in women; and 0.3%, 0.5%, and 2.0%, respectively, in men. Many people with eating disorders, who were detected in community studies in the USA, do not seek treatment ^[15].

Females who engaged in rigid dieting were found to be 18 times more likely, and those who dieted moderately 5 times more likely, to develop eating disorders ^[7].

Like females who have eating disorders, males with the illness have a warped sense of body image and often have muscle dysmorphia, a type of disorder that is characterized by an extreme concern with becoming more muscular. Some boys with the disorder want to lose weight, while others want to gain weight or “bulk

up.” Boys who think they are too small are at a greater risk for using steroids or other dangerous drugs to increase muscle mass.

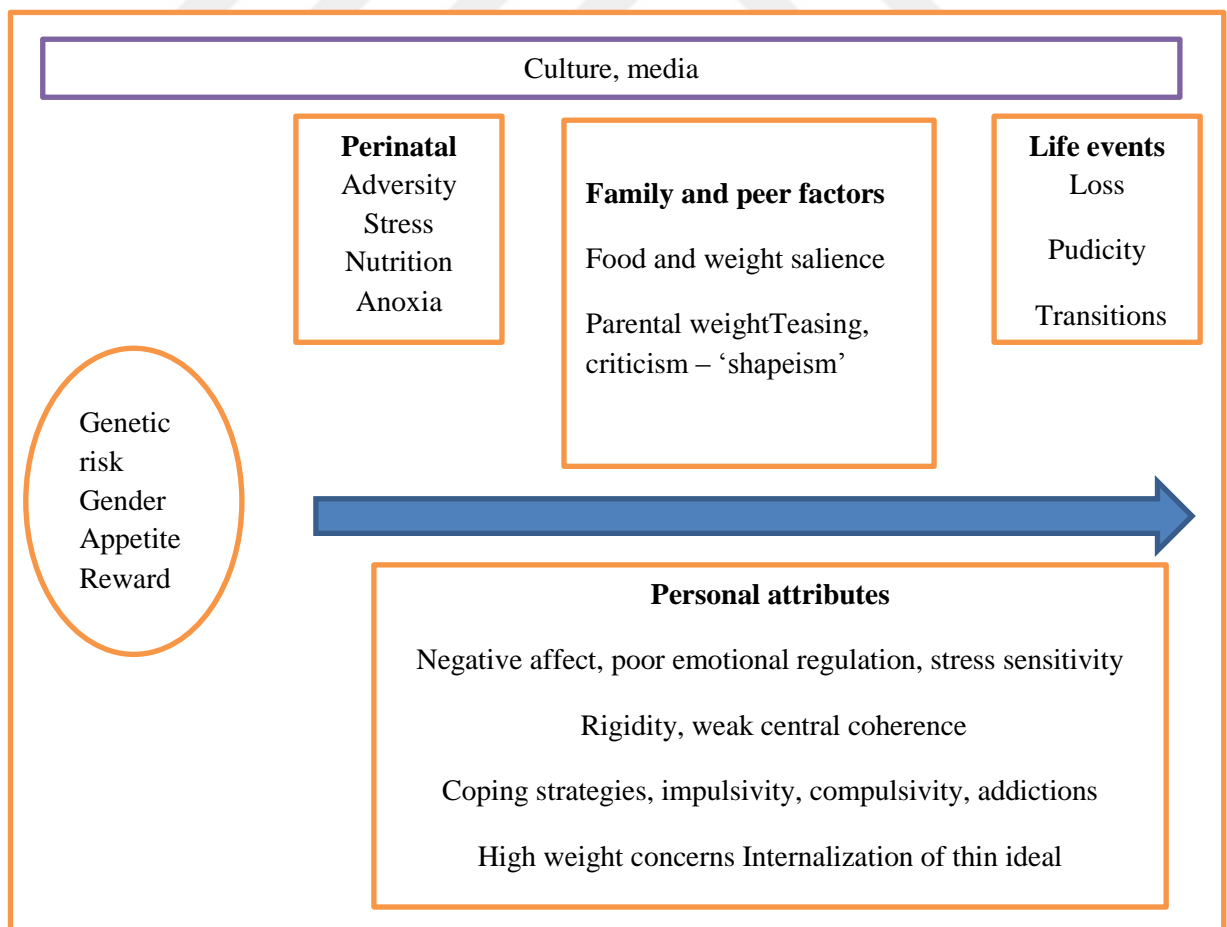
Boys with eating disorders exhibit the same types of emotional, physical and behavioral signs and symptoms as girls, but for a variety of reasons, boys are less likely to be diagnosed with what is often considered a stereotypically “female” disorder ^[18].

Some studies suggest that specific groups in the community may be at increased risk, including people with diabetes, people who are obese and people who participate in competitive sports and fitness activities ^[17].

2.3. Etiology of Eating Disorders

Family, biological, social and cultural factors may play a role in either the development or the maintenance of eating disorders ^[15].

Figure 1: Eating Disorder Risk Factors



Eating disorders have been viewed as psychiatric illnesses that are strongly influenced by social pressures towards thinness and attractiveness. Although the environmental context of these disorders must not be neglected, recent research in the area of genetic epidemiology suggests a substantial influence of genetic factors on liability to eating disorders ^[19].

The effect of genetic contribution on the etiology of eating disorders arises from both family and twin studies ^[9]. Family studies of anorexia nervosa and bulimia nervosa have consistently found a higher lifetime prevalence of eating disorders among relatives of eating disorder probands than among relatives of controls. Further, numerous twin studies suggest that liability to anorexia and bulimia nervosa is significantly influenced by additive genetic factors ^[20].

AN and BN cluster in families and controlled family studies suggest that relatives of probands with eating disorders have approximately a ten-fold greater lifetime risk of having the disorders than relatives of unaffected controls ^[21].

Systematic case-control studies indicate that the relatives of individuals with eating disorders have a 7-to 12- fold increase in the prevalence of AN and BN compared with that for control subjects. The few twin studies of AN suggest a greater resemblance among monozygotic twins relative to dizygotic twins, with 58%–76% of the variance in AN being accounted for by additive genetic factors ^[22].

Studies on the brain monoamine function observed that 5HT_{2A} receptors are reduced and 5HT_{1A} receptors are increased in both the acute and recovered state, and dopamine receptors (DA₂) within the striatum are increased after recovery ^[9].

2.3.2. Sociocultural Risk Factors

In the Western world the sharp contrast between the wide accessibility of cheap, calorie rich and highly palatable foods and the extreme value put on slimness and dietary restraint and the daily bombardment with images of emaciated supermodels and other media images of thin role-models has meant that weight and shape concerns and dieting are the norm among individuals ^[23]. Some cultural factors that contribute to eating disorders can be summarized as ^[24];

- An over-emphasis on appearance, at the expense of more meaningful attributes
- Societal beauty standards that promote an unrealistically thin body shape
- Associating thinness with positive qualities like attractiveness, health, success and love
- Media's focus on dieting and striving for a slim and toned silhouette
- Messages that perpetuate a fear of fat and food; viewing fat as undesirable or foods as "good," "bad" or "sinful"

In addition to food-related and weight related harmful experiences, general adversity (neglect and physical and sexual abuse) also increases the risk of developing an eating disorder ^[15]. Respective studies reach the conclusion that the 1/3 of the anorectic patients has been sexual abused during childhood^[25]. Studies have also showed a high prevalence of eating disorders among athletes, models, dancers, and performers ^[26].

2.3.3. Psychological Factors

Certain psychological factors and personal characteristics may predispose people to developing eating disorders. Many people with eating disorders suffer from low self-esteem, feelings of helplessness, and intense dissatisfaction with the way they look ^[27].

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) links EDs to a range of specific behavioral health disorders, such as:

- AN is an associated disorder for major depressive disorder and narcissistic personality disorder.
- Both AN and BN are associated disorders for bipolar II disorder.
- EDs in general (especially BN) are disorders associated with borderline personality disorder^[28].

Table 1: Possible Risk Factors for the Development of Eating Disorder^[29].

| | Eating-Specific Factors (Direct Risk Factors) | Generalized Factors (Indirect Risk Factors) |
|------------------------------|---|--|
| Biological Factors | <ul style="list-style-type: none"> • Specific genetic risk • Physiognomy and body weight • Appetite regulation • Energy metabolism • Gender | <ul style="list-style-type: none"> • Genetic risk for associated disturbance • Temperament • Impulsivity • Neurobiology (e.g., 5-HT mechanisms) • Gender |
| Psychological Factors | <ul style="list-style-type: none"> • Poor body image • Maladaptive eating attitudes • Maladaptive weight beliefs • Specific values or meanings assigned to food, body | <ul style="list-style-type: none"> • Poor self-image • Inadequate coping mechanisms • Self-regulation problems • Unresolved conflicts, deficits, posttraumatic reactions |

| | | |
|-------------------------------------|--|---|
| | <ul style="list-style-type: none"> • Overvaluation of appearance | <ul style="list-style-type: none"> • Identity problems • Autonomy problems |
| <p>Developmental Factors</p> | <ul style="list-style-type: none"> • Identifications with body-concerned relatives, or peers • Aversive mealtime experiences • Trauma affecting bodily experience | <ul style="list-style-type: none"> • Overprotection • Neglect • Felt rejection, criticism Traumatized • Object relationships (interpersonal experience) |
| <p>Social Factors</p> | <ul style="list-style-type: none"> • Maladaptive family attitudes to eating, weight • Peer-group weight concerns • Pressures to be thin • Body-relevant insults, teasing • Specific pressures to control weight (e.g., through ballet, athletic pursuits) • Maladaptive cultural values assigned to body | <ul style="list-style-type: none"> • Family dysfunction • Aversive peer experiences • Social values detrimental to stable, positive self-image • Destabilizing social change • Values assigned to gender • Social isolation Poor support network • Impediments to means of self-definition |

2.4. Common Symptoms in Eating Disorders

Table 2: Common Symptoms in Eating Disorders

| Behaviors |
|--|
| <p>Restrictive behavior</p> <ul style="list-style-type: none">• Cutting back on amount of food eaten• Strict rules about eating (e.g. time of day, specific macronutrient content)• Prolonged fasting (greater than 8 waking hours)• Ritualised behavior associated with the purchase, preparation, and consumption of food• Little variety in foods (e.g., extreme vegan diets, avoidance of fat, etc.)• Avoidance of social eating• Secret eating• Social competitiveness around eating <p>Binge eating</p> <ul style="list-style-type: none">• Eating an amount of food in a discrete time that is considered excessive in view of the situational context (objective)• Eating an amount of food that is not excessive in view of the context but is considered large by the individual because of associated feelings of loss of control over eating (subjective) <p>Associated features of binge eating</p> <ul style="list-style-type: none">• Eating more rapidly than normal• Eating until uncomfortably full• Eating large amounts when not hungry• Eating alone because of embarrassment• Feeling disgusted, depressed, or very guilty because of eating <p>Purgative behavior</p> <ul style="list-style-type: none">• Self-induced vomiting; spitting• Misuse of laxatives, diuretics, diet pills, etc. <p>Excessive exercise</p> <ul style="list-style-type: none">• Intense, highly driven exercising of a compulsive nature• The drive to exercise is associated with impaired social or physical function, or both |

Drinking

- Limited drinking (1.5 L per day)
- Excess drinking (>1.5 L per day)

Body checking

- Repeated weighing
- Pinching or measuring the size of body parts (e.g., circumference of wrist)
- Repeatedly checking the protrusion of specific bones
- Checking that specific clothes fit
- Mirror gazing
- Comparison with others' bodies

Body avoidance

- Avoidance of behaviors above (e.g., refusal to weigh, avoidance of mirrors, wearing bulky clothes)

Physical symptoms

- Weight loss or failure of growth with associated features of starvation—e.g., amenorrhea
- Absence of at least three consecutive menstrual cycles (women)
- Reduced libido
- Reduction in waking erections (men)
- Reduced beard growth in men
- Sensitivity to cold
- Weakness, fatigue, etc.

2.5. Classification of Eating Disorders

Three diagnostic categories are identified for eating disorders by (DSM-IV-TR): anorexia nervosa, bulimia nervosa, and third category is “eating disorders not otherwise specified (EDNOS),” which includes several variations of eating disorders. Most of these disorders are similar to anorexia or bulimia but with slightly different characteristics ^[30].

In recent years, clinicians and researchers have realized that a significant number of individuals with eating disorders did not fit into the DSM-IV categories of anorexia nervosa and bulimia nervosa. By default, many received a diagnosis of “eating disorder not otherwise specified.” Studies have suggested that a significant portion of individuals in that “not otherwise specified” category may actually have binge eating disorder ^[31].

2.5.1. Anorexia Nervosa

2.5.1.1 Definition

The term “anorexia nervosa” is derived from the Greek for lack of appetite and the Latin for nervous origin. It was first described by the English physician Richard Morton in 1689^[22].

Anorexia nervosa is a critical, potentially life-threatening eating disorder characterized by self-starvation, refusal of hunger and intentional restriction of energy and nutrient intake to a level inadequate to maintain health and normal weight (e.g., 600-900 calories/day) and excessive weight loss ^[7]. It is a serious condition and in some cases induces life threatening conditions such as psychiatric and physical co-morbidity, and poor quality of life ^[32].

Although anorexia word meaning takes part in literature as lack of appetite, people with anorexia nervosa do experience hunger and appetite, but they severely restrict food intake regardless of hunger. Primary characteristics of anorexia nervosa are an extreme desire to be thin and failure to maintain minimal body

weight (defined as 85 percent of that expected based on age and height, using standard weight tables)^[30]. Many people with anorexia see themselves as overweight, even when they are starved or are clearly malnourished^[10].

Individuals with anorexia nervosa exhibit an ego-syntonic resistance to eating and a powerful pursuit of weight loss yet are paradoxically preoccupied with food and eating rituals to the point of obsession. They have a distorted body image and, even when emaciated, tend to see themselves as “fat”, express denial of being underweight, and compulsively over exercise^[22]. Extreme body dissatisfaction, a delusion of being fat, and an obsession with being thinner, and an intense fear of gaining weight persist regardless of the amount of weight loss^[7]. A person with anorexia typically weighs herself or himself repeatedly, control portion of food carefully, and eats only very small quantities of only specific foods^[33].

2.5.1.2. Epidemiology

The incidence rate is estimated at 8 cases per 100,000 populations. 15- to 19-year-old girls have highest incidence rates for anorexia nervosa and over the last 50 years they have increased dramatically in these age groups.

Most recent data suggest that the estimated prevalence for anorexia nervosa in young women is 0.3% to 0.5%^[35]. Females are more likely than males to develop eating disorders for instance approximately 85% to 90% of adolescents with eating disorders are female^[34].

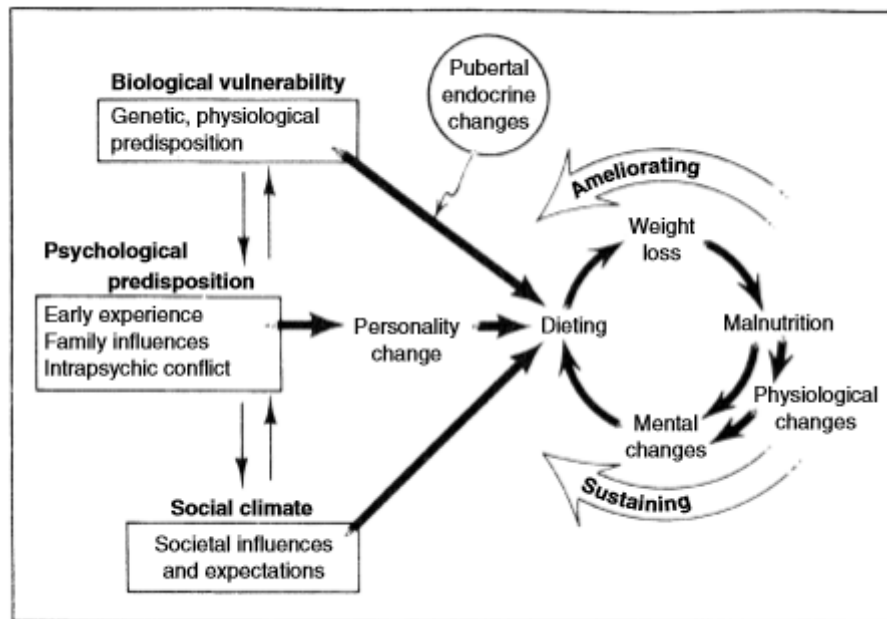
According to other studies, AN affects 0.3-3% of women and is the third most prevalent chronic disease in adolescent girls and is the third most prevalent chronic disease in adolescent girls^[35].

While it is generally accepted that AN is more common in females across the ages (only 10% of sufferers are males), recent research indicates that amongst teenagers, the number of males with AN is rising, and in this age group, an equal number of males and females have been shown to meet full criteria for diagnosis of AN^[36].

2.5.1.3. Etiology of Eating Disorders

The etiology of AN is multi factorial with a combination of biological, psychological, and sociocultural factors contributing to the development of the disorder. The specific etiology may be different for different individuals.

Figure 2: Biopsychosocial Model for Anorexia Nervosa described by Lucas (1981)



This figure demonstrates how biological vulnerability, psychological predisposition, and sociocultural influence precipitate dieting and weight loss in a vulnerable individual. This weight loss, in turn, leads to malnutrition, which contributes to the physical, psychological, and emotional alterations^[34]. In most cases it is probable that there will be a combination of causes^[11].

2.5.1.4. Risk Factors of Anorexia Nervosa

Risk factors for anorexia nervosa are factors that do not seem to be a direct cause of the disorder but increase the possibility of developing the disorder. The absence of any risk factor or the presence of a protective factor does not necessarily protect one against developing anorexia nervosa.

Potential risk factors predisposing to anorexia nervosa were summarized by a recent review ^[34]:

1. Age and gender: Anorexia nervosa usually develops during adolescence. Being female, is probably the most reliable risk factor for anorexia nervosa.

2. Early childhood eating problems: Picky eating, anorexic symptoms in childhood, digestive and early eating-related problems, eating conflicts, struggles concerning meals are thought to be risk factors for anorexia nervosa.

3. Weight concerns/negative body image/dieting: Studies suggested that dieting is important risk factor for development of eating disorder in teenagers. Adolescent girls who diet are more likely to develop an eating disorder than girls who do not diet.

4. Perinatal events: Perinatal adverse events (prematurity, small for gestational age, and cephalohematoma) may increase the risk of developing anorexia nervosa. Furthermore, young women with a past history of anorexia nervosa may have an increased risk of experiencing adverse perinatal events.

5. Personality traits: The personalities of adolescents with anorexia nervosa are characterized by perfectionism, anxiety, low self-esteem, and obsessionality.

6. Early puberty: Girls who experience early puberty have greater risk for developing an eating disorder because puberty is a time for biological changes in body weight, shape, and size with increased deposition of body fat.

7. Chronic illness: Teenagers with chronic illness, such as diabetes mellitus, are at greater risk for developing an eating disorder.

8. Physical and sexual abuse: Research suggests that adolescents who have been sexually abused have about the same or only slightly higher incidence of anorexia nervosa as those who have not been abused.

9. Family history/family psychopathology: There are elevated rates of psychiatric disorders (anxiety disorders and affective disorders) in first-degree relatives of patients with anorexia nervosa.

10. Competitive athletics: Participation in certain sports or activities that place a high emphasis on bodyweight and appearance (e.g., ballet and gymnastics) put young people at risk for anorexia nervosa.

2.5.1.5. Diagnostic Criteria for Anorexia Nervosa

2.5.1.5.1. Diagnostic and Statistical Manual of Mental Disorders

The Diagnostic and Statistical Manual of Mental Disorders (DSM) is the standard classification of mental disorders used by mental health professionals in the United States. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) is the current edition and has been designed for use across clinical settings (inpatient, outpatient, partial hospital, consultation-liaison, clinic, private practice, and primary care), with community populations. Psychiatrists and other physicians, psychologists, social workers, nurses, occupational and rehabilitation therapists, and counselors can use these criteria ^[37].

2.5.1.5.1.1. Diagnostic and Statistical Manual of Mental Disorders 4th Edition

Text Revision (DSM-IV-TR) Classification

Table 3: American Psychiatric Association (DSM-IV-TR) (2000); Classification of Anorexia Nervosa

| |
|---|
| A. Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight <85% of that expected), or failure to make expected weight gain during period of growth, leading to body weight <85% of that expected. |
| B. Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight <85% of that expected), or failure to make expected weight gain during period of growth, leading to body weight <85% of that expected. |
| C. Intense fear of gaining weight or becoming fat, although underweight. |

| |
|---|
| |
| D. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body shape and weight on self-evaluation, or denial of the seriousness of current low body weight. |
| E. In postmenarcheal females, amenorrhea, that is, the absence of at least three consecutive menstrual cycles. (A woman is considered to have amenorrhea if her periods occur only following hormone, e.g., estrogen administration.) |

2.5.1.5.1.2.Changes in the Diagnostic Criteria for Anorexia Nervosa

Eating Disorders Workgroups for the fifth edition of the Diagnostic and Statistical Manual (DSM-5) currently in development have recommended changes in the diagnostic criteria for Anorexia Nervosa.

A significant recommended change is to eliminate criterion D, amenorrhea. The reason for the proposed change is that some individuals exhibit all other symptoms and signs of anorexia nervosa but report at least some menstrual activity^[30]. For this reason The DSM-IV Criterion D requiring amenorrhea, or the absence of at least three menstrual cycles, will be deleted. This criterion cannot be applied to males, pre-menarchal females, females taking oral contraceptives and post-menopausal females. In some cases, individuals exhibit all other symptoms and signs of anorexia nervosa but still report some menstrual activity^[31].

2.5.1.5.2. International Classification of Diseases; 10th Edition (ICD-10) Classification

The World Health Organization (WHO, 2007) states Anorexia Nervosa can be diagnosed if the following symptoms exist:

Table 4: International Classification of Diseases; 10th Edition (ICD-10), Classification of Anorexia Nervosa

| |
|--|
| 1) "Body weight is maintained at least 15% below that expected (either lost or never achieved). Prepubertal patients may show failure to make the expected weight gain during the period of growth. |
| 2) The weight loss is self-induced by avoidance of "fattening foods". One or more of the following may also be present: self-induced vomiting; self-induced purging; excessive exercise; use of appetite suppressants and/or diuretics. |
| 3) There is body-image distortion in the form of a specific psychopathology whereby a dread of fatness persists as an intrusive, overvalued idea and the patient imposes a low weight threshold on himself or herself. |
| 4) A widespread endocrine disorder involving the hypothalamic - pituitary - gonadal axis is manifest in women as amenorrhoea and in men as a loss of sexual interest and potency. (An apparent exception is the persistence of vaginal bleeds in anorexic women who are receiving replacement hormonal therapy, most commonly taken as a contraceptive pill.) There may also be elevated levels of growth hormone, raised levels of cortisol, changes in the peripheral metabolism of the thyroid hormone, and abnormalities of insulin secretion. |
| 5) If onset is prepubertal, the sequence of pubertal events is delayed or even arrested (growth ceases; in girls, the breasts do not develop and there is a primary amenorrhea; in boys, the genitals remain juvenile). With recovery, puberty is often completed normally, but the menarche is late." |

2.5.1.6. Sub-Types of Anorexia Nervosa

Anorexia Nervosa includes two sub types; Restricting Subtype and Binge Eating/Purging Subtype. Both are very serious mental illnesses that require treatment.

2.5.1.6.1. Restricting Subtype

People with Anorexia Nervosa Restricting Subtype place severe restriction on the amount and type of food they consume. This can manifest in different ways including some or all of the following:

- Limiting certain types of foods (e.g. carbohydrates, ‘fatty’ foods)
- Counting calories
- Skipping meals
- Obsessive rules and rigid thinking (e.g. only eating food that is one color)

These restrictive behaviors around food can be accompanied by excessive exercise.

2.5.1.6.2. Binge Eating/Purging Subtype

People with Anorexia Nervosa Binge Eating/Purging Subtype also place severe restriction on the amount and type of food they consume. In addition to this the person will also have binge eating/purging behavior. These behaviors include:

- Binge eating – eating a large amount of food accompanied by a feeling of ‘loss of control’
- Self-induced vomiting, deliberately misusing laxatives, diuretics or enemas to compensate for eating food^[36].

2.5.1.6.3. Atypical Anorexia Nervosa

In some individuals, including those who are in the process of recovering from anorexia nervosa, the clinical picture may point towards a diagnosis of anorexia but the individual may not have all of the symptoms that are required by the diagnostic classification for the disorder. For instance, an individual may have a weight which is slightly above the BMI limit of 17.5 kg/m² or have extreme weight loss but have continued to menstruate. Individuals who have all symptoms but to a very mild extent may also be identified as having atypical anorexia.

This diagnosis excludes conditions where a psychiatric condition is the reason for the weight loss ^[11].

2.5.1.7. Complications of Anorexia Nervosa

Anorexia nervosa is the most life threatening and serious systematic disease affecting virtually all major organ systems particularly in combination with purging behaviors^{[7],[38]}.

During its course, many complications may occur. Immediate effects include dizziness, headaches, brain fogginess, cold, nausea, weakness and blurred vision. The long term effects are osteoporosis, cardiovascular disturbances, diabetes mellitus, thyroid disorders, gastrointestinal disorder, fertility and pregnancy problems and other psychiatric disorders ^[32].

Studies suggest that the risk of death is significantly higher in those suffering from anorexia nervosa than in general population. Related deaths result from physical health complications of the disorder as well as suicide ^[14].

According to some studies, people with anorexia are up to ten times more likely to die as a result of their illness compared to those without the disorder ^[10].

Mortality ranges from 7-10%, most frequently related to cardiovascular changes secondary to starvation, gastric hemorrhaging, and suicide. The severity of risk is determined by duration and intensity of malnutrition, weight loss and purging^[7].

Harbottle et al. studied 954 patients and using statistical tools estimated years of life remaining after the onset of AN versus normal life. According to this study, women diagnosed with AN at the age of 15 years are likely to live 25 years less than predicted for the normal population; women diagnosed at the age of 20 are predicted to have 36.6 years of life remaining, versus 60.5 for the normal population; and for those in whom AN starts at the age of 25 the estimate of years of life remaining is 32.2, versus 55.5^[39].

Table 5: Potential Medical, Nutrition and Psychological Consequences of Anorexia^[7];

| | |
|--|---|
| <p>Endocrine/Metabolic</p> <p>Menstrual dysfunction</p> <p>Delayed menarche/secondary amenorrhea</p> <p>Delayed growth and development</p> <p>Regression of secondary sex characteristics</p> <p>Decreased testosterone levels (males)</p> <p>Decreased metabolic rate and resting energy expenditure</p> <p>Appetite and thirst dysregulation</p> <p>Low T3 syndrome</p> <p>Protein calorie malnutrition</p> | <p>Cardiovascular</p> <p>Cardiac arrhythmias</p> <p>ECG abnormalities</p> <p>Bradycardia (<60 bpm)</p> <p>Hypotension</p> <p>Orthostatic hypotension</p> <p>Decreased left ventricular mass and stroke volume</p> <p>Congestive heart failure</p> <p>Cardiac arrest</p> |
| <p>Vitamin, mineral and essential fatty acid deficiencies</p> <p>Hypoglycemia</p> <p>Ketonuria</p> <p>Hypothermia</p> <p>Cold intolerance</p> | <p>Gastrointestinal</p> <p>Delayed gastric emptying</p> <p>Constipation/obstipation</p> <p>Postprandial discomfort,</p> <p>Bloating after small meals</p> |

| | |
|---|--|
| Depressed immune function | |
| Skeletal Decreased bone mass Osteopenia (decreased bone density) Stress fractures | Neuropsychiatric Depression Anxiety Structural brain abnormalities, Brain tissue loss Impaired concentration Lack of insight Sleep disturbances |

Amenorrhea has been related to hypothalamic dysfunction, weight loss, decreased amount and distribution of body fat, malnutrition, anxiety, emotional stress, and intensive exercise. Amenorrhea of six months or longer has been associated with significant loss of bone density, failure to attain peak bone mass, and increased risk of osteopenia, premature osteoporosis and fractures. Bone changes have been attributed to estrogen deficiency, elevated cortisol levels, and deficiency of insulin-like growth factor. About 20% of adolescents with anorexia nervosa experience amenorrhea prior to weight loss. Resumption of menses generally occurs when the patients weigh about 90% of their ideal body weight but amenorrhea may persist when there is a low percentage of body fat or there are unresolved emotional issues.

Since energy needs take priority in metabolism, dietary protein is converted to energy by gluconeogenesis when caloric intake is insufficient. Decreased protein availability can result in muscle-wasting and failure to achieve usual growth-related increases in lean body mass. Acute or chronic malnutrition in early puberty (before

completion of the growth spurt and closure of the epiphysis) may result in permanent growth retardation and short stature. Inadequate energy intake results in an approximately 30% decrease in metabolic rate, accompanied by fatigue, decreased body temperature and cold intolerance. Metabolic activity of muscle, bone, the heart, and the endocrine system is lowered.

Nearly one-half of adolescent anorexics with restricted eating, and one-fourth of those who purged were found to have heart rates <40 bpm. In addition to hypometabolism as an adaptation to starvation, a reduction in heart mass can also contribute to decreased heart rate and pulse. Orthostatic blood pressure changes (decrease in systolic blood pressure of >20 mm Hg or <20 bpm increase in pulse rate from lying/sitting to standing position) may reflect chronic volume depletion ^[7].

2.5.2. Bulimia Nervosa

2.5.2.1. Definition

Bulimia nervosa (BN) is an eating disorder characterized by binge eating coupled with compensatory behaviors intended to promote weight loss such as self-induced vomiting, laxative abuse, excessive exercise, or prolonged fasting ^[34]. It was first described by the psychiatrist Russell in 1979^[11].

Those who suffer from bulimia utilize their binge and purge cycles to prevent weight gain and to regulate other emotional difficulties^[40]. Unlike anorexia, people with bulimia can fall within the normal range for their age and weight. But like people with anorexia, they often fear gaining weight, want desperately to lose weight, and are intensely unhappy with their body size and shape^[10] and also individuals who develop bulimia have often had past episodes of anorexia^[11].

Evidence suggests that individuals who have bulimia will often have co-existing psychiatric disorder; with studies in the United States suggesting nearly all individuals with the condition had an additional disorder such as mood disorder, anxiety, depression, impulse control problems or substance abuse issues ^[41].

People with bulimia have different eating behavior and perception of body shape;

Frequent episodes of binge eating; A person with BN will repeatedly engage in binge eating episodes where they eat a large amount of food in a short period of time. During these episodes they will feel a loss of control over their eating and may not be able to stop even if they want to.

Compensatory behaviors; Compensatory weight control behaviors are methods which people with BN will employ in attempt to ‘balance out’ or ‘make up’ for their binge eating. These include self-induced vomiting, over exercising or misusing laxatives, enemas or diuretics and fasting. They usually exhibit bulimic behaviors and they do it is secretly, because it is often accompanied by feelings of disgust or shame. The bingeing and purging cycle usually repeats several times a week.

Preoccupation with body shape; People with BN place an excessive amount of emphasis on their bodies, shape and weight. This can lead to the person’s sense of self and self-worth being wholly defined by the way they look.

2.5.2.2. Diagnostic Criteria for Bulimia Nervosa

2.5.2.2.1. Diagnostic and Statistical Manual of Mental Disorders 4th Edition Text Revision (DSM-IV-TR) Classification

Table 6:American Psychiatric Association (DSM-IV-TR) (2000); Classification of Bulimia Nervosa

| |
|---|
| Recurrent episodes of binge eating, where episodes of binge eating are characterized by both of the following: |
| 1) Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances. |

2) A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)

- Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.
- The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months.
- Self-evaluation is unduly influenced by body shape and weight.
- The disturbance does not occur exclusively during episodes of AN

2.5.2.2.2. International Classification of Diseases; 10th Edition (ICD-10) Classification

Table 7: International Classification of Diseases; 10th Edition (ICD-10); Classification of Bulimia Nervosa

- “There is a persistent preoccupation with eating, and an irresistible craving for food; the patient succumbs to episodes of overeating in which large amounts of food are consumed in short periods of time.
- The patient attempts to counteract the "fattening" effects of food by one or more of the following: self-induced vomiting; purgative abuse, alternating periods of starvation; use of drugs such as appetite suppressants, thyroid preparations or diuretics. When bulimia occurs in diabetic patients they may choose to neglect their insulin treatment.
- The psychopathology consists of a morbid dread of fatness and the patient sets herself or himself a sharply defined weight threshold, well below the premorbid weight that constitutes the optimum or healthy weight in the opinion of the

physician. There is often, but not always, a history of an earlier episode of anorexia nervosa, the interval between the two disorders ranging from a few months to several years. This earlier episode may have been fully expressed, or may have assumed a minor cryptic form with a moderate loss of weight and/or a transient phase of amenorrhoea.”

2.5.2.3. Subtypes of Bulimia Nervosa

The DSM-IV-TR specifies two types of bulimia:

Purging Type: during the current episode BN, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Non-purging Type: during the current episode of BN, the person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Atypical Bulimia Nervosa

This diagnosis is appropriate where individuals may have a clinical picture which points towards a diagnosis of bulimia but the individual may not have all of the symptoms that are required by the diagnostic classification for the disorder. Typically this is an individual who is of normal or even excessive weight who attempts to control their weight by following periods of excessive eating with some form of purgative behavior.

2.5.2.4. Etiology of Bulimia Nervosa

There is a considerable overlap in the etiological factors for bulimia nervosa. Bulimia appears to be the result of exposure to general risk factors of psychological disorders and to risk factors for dieting.

Risk factors for bulimia include ^[11]:

- Demographic factors: being female, adolescent and residing in a developed society
- A family history of psychiatric disorder especially depression
- Disturbed family dynamics, adverse childhood experiences
- Depression
- Alcohol and /or substance abuse both in the individual and in close relatives
- Childhood sexual abuse: in some studies a high incidence sexual abuse is reported by women with diagnosed eating disorders; rates of abuse are seemingly higher in bulimia than anorexia^[40].
- Low self esteem and/or perfectionism
- Obesity and/or parental obesity
- Parental weight/shape concern or exposure to a social environment that encourages dieting (e.g. having a medical condition where there is a concern regarding diet such as diabetes, being involved in a occupation where there is a focus on thinness such as ballet)
- Early menarche

2.5.2.5. Warning Signs of Bulimia Nervosa

The warning signs of BN can be physical, psychological and behavioral. It is possible for someone with BN to display a combination of these symptoms ^[34].

- Evidence of binge eating, including disappearance of large amounts of food in short periods of time or finding wrappers and containers indicating the consumption of large amounts of food. The most common triggers for binge eating include negative mood, interpersonal stress, hunger due to dietary restriction, and negative feeling related to one's body image. The individual often experiences feelings of being "out of control" during the binge episode. Binging occurs after a short period of starvation, typically in the afternoon after having skipped breakfast or lunch, or late in the evening.

- Binges can be enormously large in caloric content (as high as 3,000–5,000 kcal). After a binge, feelings of guilt and shame together with fear of weight gain result in purging. The bingeing and purging is often done secretly. Purging may initially have a calming effect and relieve guilt over a binge episode. This may lead to recurrent cycles of bingeing and purging in an attempt to manage feelings of depression and anxiety. Initially, the binge–purge activity may be infrequent, but with time, it may increase to daily or even several times a day. In addition, as the condition progresses, some individuals with bulimia nervosa will purge even after ingesting normal or small amounts of any food that might be considered high in calories or fat. Therefore, over time, what began as a diet or weight-control measure turns into a means of mood regulation with the bingeing and purging behaviors becoming a source of coping.
- Evidence of purging behaviors, including frequent trips to the bathroom after meals, signs and/or smells of vomiting, presence of wrappers or packages of laxatives or diuretics.
- Excessive, rigid exercise regimen--despite weather, fatigue, illness, or injury, the compulsive need to “burn off” calories taken in.
- Unusual swelling of the cheeks or jaw area.
- Calluses on the back of the hands and knuckles from self-induced vomiting. This physical sign is known as Russell sign’s.
- Discoloration or staining of the teeth.
- Creation of lifestyle schedules or rituals to make time for binge-and-purge sessions.
- Withdrawal from usual friends and activities.
- Frequently weighing self. In general, behaviors and attitudes indicating that weight loss, dieting, and control of food are becoming primary concerns.
- Continued exercise despite injury; overuse injuries.

2.5.2.6. Complications of Bulimia Nervosa

Bulimia nervosa can be extremely harmful to the body. The recurrent binge-and-purge cycles can damage the entire digestive system and purging behaviors can lead to electrolyte and chemical imbalances in the body that affect the heart and other major organ functions.

Table 8:Some of the Health Consequences of Bulimia Nervosa^[7].

| | |
|---|---|
| <p>Fluid and Electrolyte Abnormalities</p> <p>Hypokalemia</p> <p>Hyponatremia</p> <p>Hypochloremic Metabolic Alkalosis</p> <p>Metabolic Acidosis</p> <p>Hypomagnesemia</p> <p>Hyphosphatemia</p> <p>Dehydration</p> <p>Hypovolemia</p> | <p>Gastrointestinal</p> <p>Impaired Satiety</p> <p>Gastric/Esophageal Irritation, Bleeding</p> <p>Gastroesophageal Reflux</p> <p>Gastric/Esophageal Rupture</p> <p>Abdominal Pain/Bloating</p> <p>Diarrhea, Abdominal Cramping (Laxative Abuse)</p> <p>Rebound Constipation</p> <p>Reflex Hypofunctioning Of The Colon (Laxative Abuse)</p> <p>Malabsorption</p> <p>Acute Pancreatitis</p> |
| <p>Neuropsychiatric</p> <p>Depression</p> <p>Anxiety</p> <p>Guilt</p> | <p>Cardiovascular</p> <p>Cardiomyopathy (ipecac use)</p> <p>Cardiac arrhythmias (potassium depletion)</p> |

- Patients with bulimia nervosa often have features of depression (30-70% lifetime rates are reported), especially low self-esteem. They may also have features of anxiety (again, 30-70% lifetime rates are reported). Patients also have high rates of anxiety disorder and panic disorder, and post-traumatic stress disorder is common. Deliberate self-harm and alcohol and substance misuse are also common. Approximately half the clinical sample report stealing^[40].
- Loss of hydrogen ions with vomiting increases bicarbonate levels, resulting in metabolic alkalosis. Intestinal loss of bicarbonate, chloride, and potassium with laxative abuse can cause metabolic acidosis.
- Fluid loss and volume depletion from vomiting/laxative abuse, which can be intensified by diuretic use or fasting, causes secondary hyperaldosteronism, renal potassium loss and hypokalemia
- Hypophosphatemia and hypomagnesemia can occur from laxative abuse; low serum phosphate levels have also been noted in those who vomit 3 or more times per day.

2.5.3. Eating Disorders Not Otherwise Specified (EDNOS)

EDNOS refers to the diagnostic category of patients who have problems with eating or body image but who do not meet full DSM-IV criteria for either anorexia nervosa or bulimia nervosa. This category accounts for most adolescents presenting for treatment. Importantly, these adolescents suffer from the same medical complications and similar degree of psychological distress as those who meet full criteria. Some of the individuals in the EDNOS category represent those with subthreshold anorexia nervosa or bulimia nervosa, but others represent qualitatively distinct disorders. This heterogeneous diagnostic category is likely to undergo further refinement in the near future.

Examples of individuals with EDNOS include:

1. Teens with all the criteria for anorexia nervosa but who have regular menses
2. Individuals who appear to have anorexia nervosa, but despite significant weight loss, their present weight is in the normal range
3. Individuals who meet all the criteria for bulimia nervosa except that the frequency of bingeing or purging is less than twice a week or lasts for <3 months
5. Adolescents who repeatedly chew and spit out but do not swallow their food
6. Individuals who binge-eat but do not purge

The diagnoses within this classification not only consist of anorexia nervosa and bulimia nervosa but also include the following diagnostic categories^[34]:

1. Food avoidance emotional disorder (FAED): FAED refers to a condition seen in children 8 to 13 years old where the child refuses to eat. There is no fear of becoming fat and no distortion in body image. This condition may be accompanied by growth retardation and weight loss.
2. Selective eating disorder (SED): SED refers to those younger patients who will limit their foods to one or two foods for a prolonged period of time. They are unwilling to try new foods, which can be a major source of frustration for their parents. Similar to those with FAED, they do not have the cognitive distortions regarding weight or shape. Their weight and height are usually appropriate for age.
3. Functional dysphagia: Functional dysphagia refers to children and younger adolescents who will avoid certain foods because of a fear of swallowing, choking, or vomiting. Often there is a history of an episode of choking on a specific food.
4. Pervasive food refusal: Pervasive food refusal refers to children and younger adolescents who have a profound refusal to eat, drink, walk, and talk or self-care and are resistant to efforts to help. The overriding similarities among these diagnostic criteria are the lack of abnormal cognitions and morbid preoccupation with weight and shape.

2.5.4. Binge Eating Disorder (BED)

2.5.4.1. Definition

Binge Eating Disorder (BED) is a serious mental illness and it can be defined as recurring episodes of eating significantly more food in a short period of time than most people would eat under similar circumstances, with episodes marked by feelings of lack of control. This disorder is associated with marked distress and occurs, on average, at least once a week over three months.

Someone with binge eating disorder may eat too quickly, even when he or she is not hungry. As a result, people with binge eating disorder often are overweight and obese. They also experience guilt, embarrassment, or disgust about binge eating, may binge eat alone to hide the behavior and they can become consequently socially isolated ^[11].

Unlike bulimia, a person with binge eating disorder will not use compensatory behaviors, such as self-induced vomiting or over-exercising after binge eating.

2.5.4.2. Diagnosis Criteria for Binge Eating Disorder

BED was approved for inclusion in DSM-5 as its own category of eating disorder. In DSM-IV, BED was not recognized as a disorder but rather described in Appendix B: Criteria Sets and Axes Provided for Further Study and was diagnosable using only the catch-all category of “eating disorder not otherwise specified.” This change is intended to increase awareness of the substantial differences between binge eating disorder and the common phenomenon of overeating ^[42].

2.5.4.2.1. Proposed DSM-5 Diagnostic Criteria for Binge Eating Disorder

Table 9: DSM-5 Diagnostic Criteria for Binge Eating Disorder

| |
|---|
| <p>A. Recurrent episodes of binge eating.</p> <ol style="list-style-type: none">1. Eating, in a discrete period of time (for example, within any 2-hour period), an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstances2. A sense of lack of control over eating during the episode (for example, a feeling that one cannot stop eating or control what or how much one is eating) |
| <p>B. The binge eating episodes are associated with three (or more) of the following:</p> <ol style="list-style-type: none">1. Eating much more rapidly than normal2. Eating until feeling uncomfortably full3. Eating large amounts of food when not feeling physically hungry4. Eating alone because of being embarrassed by how much one is eating5. Feeling disgusted with oneself, depressed, or very guilty afterwards |
| <p>C. Marked distress regarding binge eating is present.</p> |
| <p>D. The binge eating occurs, on average, at least once a week for three months.</p> |
| <p>E. The binge eating is not associated with the recurrent use of inappropriate compensatory behavior (for example, purging) and does not occur exclusively during the course of Anorexia Nervosa, Bulimia Nervosa, or Avoidant/Restrictive Food Intake Disorder.</p> |

2.5.4.3.Warning Signs of Binge Eating Disorders

The warning signs of BED can be physical, psychological and behavioral. People with BED can display a combination of these symptoms.

Table 10: Physical, Psychological and Behavioral Signs of Binge Eating Disorder^[43]

| Physical Signs |
|---|
| <ul style="list-style-type: none">• Feeling tired and not sleeping well• Feeling bloated, constipated or developing intolerances to food |
| Psychological Signs |
| <ul style="list-style-type: none">• Preoccupation with eating, food, body shape and weight• Extreme body dissatisfaction and shame about their appearance• Feelings of extreme distress, sadness, anxiety and guilt during and after a binge episode• Low self esteem• Increased sensitivity to comments relating to food, weight, body shape, exercise• Depression, anxiety or irritability |
| Behavioral Signs |
| <ul style="list-style-type: none">• Evidence of binge eating (e.g. disappearance or hoarding of food)• Secretive behavior relating to food (e.g. hiding food and food wrappers around the house)• Evading questions about eating and weight• Increased isolation and withdrawal from activities previously enjoyed• Erratic behavior (e.g. shoplifting food or spending large amounts of money on food)• Self-harm, substance abuse or suicide attempt |

2.5.5. Orthorexia Nervosa (ON)

2.5.5.1. Definition of Orthorexia Nervosa

The term “orthorexia” comes from the Greek word “orthos”, which literally means “accurate, straight, right, valid or correct” and “orexis” meaning hunger or appetite.

Orthorexia Nervosa is defined by Steven Bratman for the first time in 1997. This concept of orthorexia is used to identify pathological fixation on the consumption of appropriate and healthy food. People with orthorexia are likely to shun foods which may contain pesticide residues or genetically modified ingredients, unhealthy fatty foods having too much salt or too much sugar and other components. The methods of preparation (a particular way of cutting vegetables) and materials (ceramics only or only wood) are also part of the obsessive ritual ^[44].

2.5.5.2. Diagnostic Criteria of Orthorexia Nervosa

ON has not been recognized as a disorder by Diagnostic and Statistical Manual of Mental Disorders of American Psychiatric Association but it is similar to other eating disorders. Whereas other recognized eating disorders, e.g., anorexia nervosa or bulimia nervosa are expressed in quantitative manner (i.e. the quantity of food consumed, calories and weight), ON is expressed in qualitative way (i.e. the quality of the food consumed not about being “thin” and losing weight) ^[45]

According to Bratman & Knight (2000) orthorexia nervosa can be diagnosed by the presence of following characters ^[46];

- Spending more than 3 hours per day for thinking about and preparing healthy food.
- Feeling superior to those with differing eating habits.
- Following a particular self-imposed dietary regimen rigidly and engaging in compensatory restriction to make up for any dietary indiscretions.
- Attaching self-esteem to adherence to the self-imposed diet (feeling of self-satisfaction when complying with the self-imposed dietary regimen).

- Making consumption of healthy diet the central focus of life, at the expense of other personal values, relationships, previously enjoyed activities, and sometimes, ironically, physical health.
- Making nutritional value of meal more important than the pleasure of eating it.



3. MATERIALS AND METHODS

3.1. Participants

The research was conducted among 202 university students who have studied at first and fourth year of nutrition and dietetics undergraduate students in Yeditepe University, between 2013-2014 and 2014-2015 academic years. This included 121 first year dietetics students (59.9 % of the study sample); 81 fourth year dietetics students (40.1 % of the study sample).

3.2. Instruments

The students at each class completed the questionnaire by way of self-reporting during a class period.

3.2.1. EAT-40 Test

The assessment of eating disorders status of nutrition and dietetics students was determined by applying the Eating Attitudes Test (EAT-40). The test served as a measure of disordered attitudes and behaviors towards eating and body weight control.

The EAT-40 was originally designed by Garner and Garfinkel (1979) to examine symptoms of anorexia nervosa. It was later validated as a broad measure of abnormal eating patterns and is now used as a screening tool for undifferentiated eating disorders in high risk populations^{[3][47]}.

Turkish validity and reliability study of this scale was modified by Savaşır and Erol to suit the Turkish culture and norms. It has been widely used in various studies in Turkey, and it has been accepted that the Turkish version of the scale has sufficient reliability and criterion related validity.

The test is a self-administrated questionnaire and contains 40 questions. Each item is valued in a 6-point Likert scale that ranges from “never” to “always”. The answers to the items 1, 18, 19, 23, 27 and 39 are evaluated as: sometimes: 1 point, hardly ever: 2 points, never: 3 points and 0 point for the other choices. The answers

to the other questions are evaluated as always: 3 points, very often: 2 points, often: 1 point and 0 point for the other choices ^[48].

In the scale total points obtained from test results are classified as follows: a score of 30 and above indicate high risk (abnormal eating behavior), between 21 and 30 indicate moderate risk and below 21 indicate low risk ^[49].

3.2.2. Anthropometric Measurements

In the study, nutritional status was achieved by anthropometric measurements. For this reason weight and height measurements were collected from all participants. According to obtained data, Body Mass Index (BMI) was calculated by dividing the weight (kg) by the height (m) squared. Subjects were classified into four groups (underweight, normal weight, overweight and obesity)

BMI is a measure of weight adjusted for height, calculated as weight in kilograms divided by the square of height in meters (kg/m^2). BMI is a simple, inexpensive, and noninvasive surrogate measure of body fat ^[50].

Table 11: Body Mass Index Classification According to WHO

| Classification | BMI(kg/m²) | Chronic disease risk |
|-----------------------|------------------------------|---|
| Underweight | <18,5 | Low (but increased mortality and morbidity from other causes) |
| Severe Thinness | <16 | |
| Moderate Thinness | 16-16,9 | |
| Mild Thinness | 17-18,5 | |
| Normal Range | 18.5-24,9 | Average |
| Overweight | ≥ 25.0 | |
| Pre-obese | 25-29,9 | Increased |
| Obese | ≥ 30.0 | |
| Obese Class I | 30-34,9 | Moderate |
| Obese Class II | 35-39,9 | Severe |
| Obese Class III | ≥ 40.0 | Very Severe |

3.3.Statistical Analysis

Statistical analyses were performed using Statistical Packages for Social Science, SPSS(Version 16.0) (SPSS Inc., Chicago, IL, USA) with statistical significance set at $p < 0.05$.

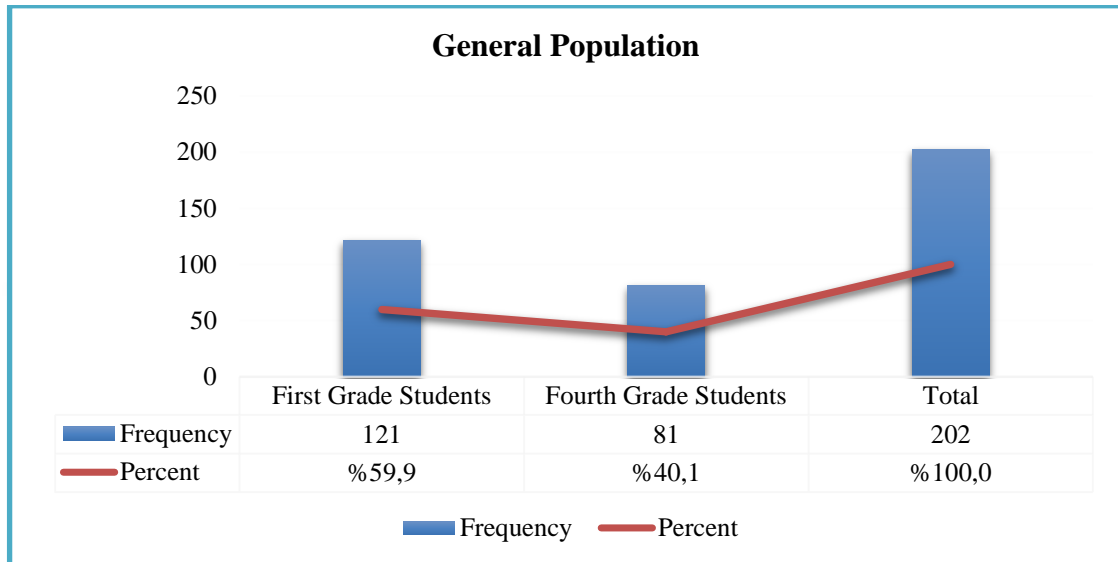
In this study, normality was tested using the Kolmogorov-Smirnov test. According to test result, sample distribution was not normal ($p < 0.05$). Parameters which were assessed in this study did not meet the requirements of a normal distribution so non parametric tests were determined as analysis method. Chi-square tests which are non-parametric methods were found appropriate procedure in this study. *The chi-square test is used to determine whether there is a significant

difference between the expected frequencies and the observed frequencies in one or more categories.



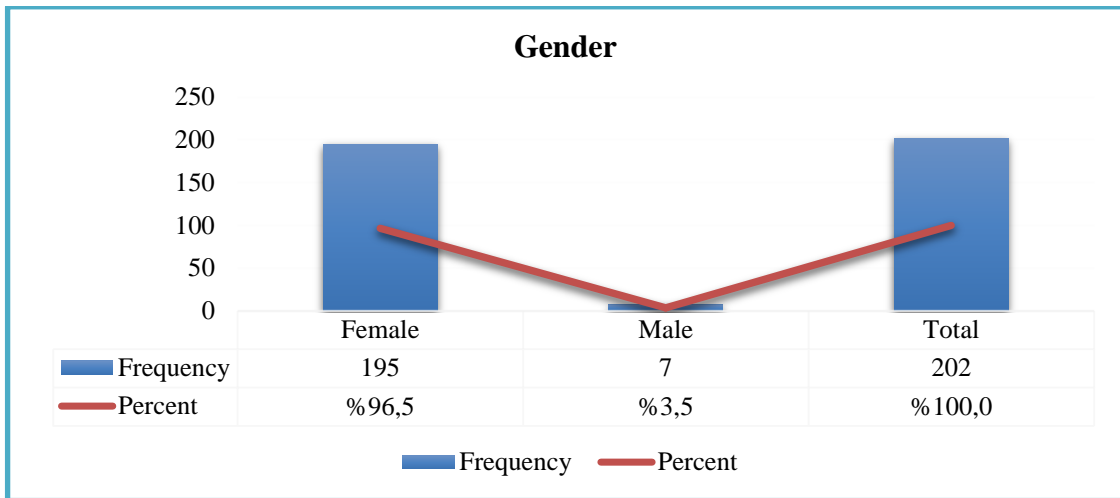
4. RESULTS

Table 12: Distribution of Participants



This study was applied among first and fourth grade of nutrition and dietetics students in September 2013 and 2014, recruited from Yeditepe University in İstanbul. Participants in the study comprised 121 students (59.9%) from first grade and 81 students from (40.1%) fourth grade.

Table 13: Gender of Participants



When participants were analyzed according to their gender, 195 females (96.5%) and 7 males (3.5%) between 18 and 24 years old (mean age, 20.6± 1.6 years.) were found.

Table 14: EAT-40 Point Distribution

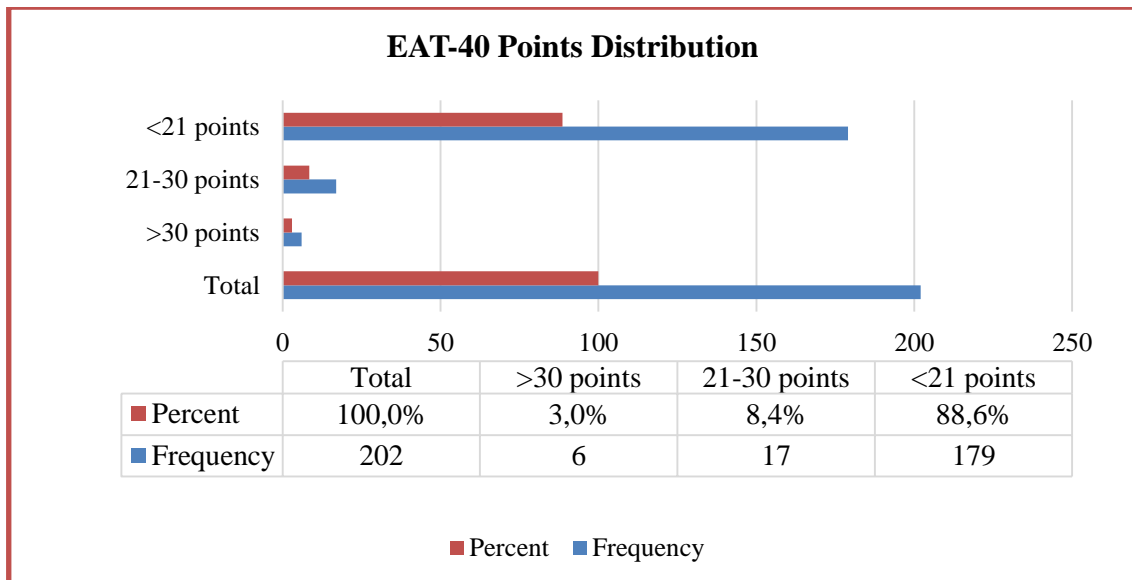
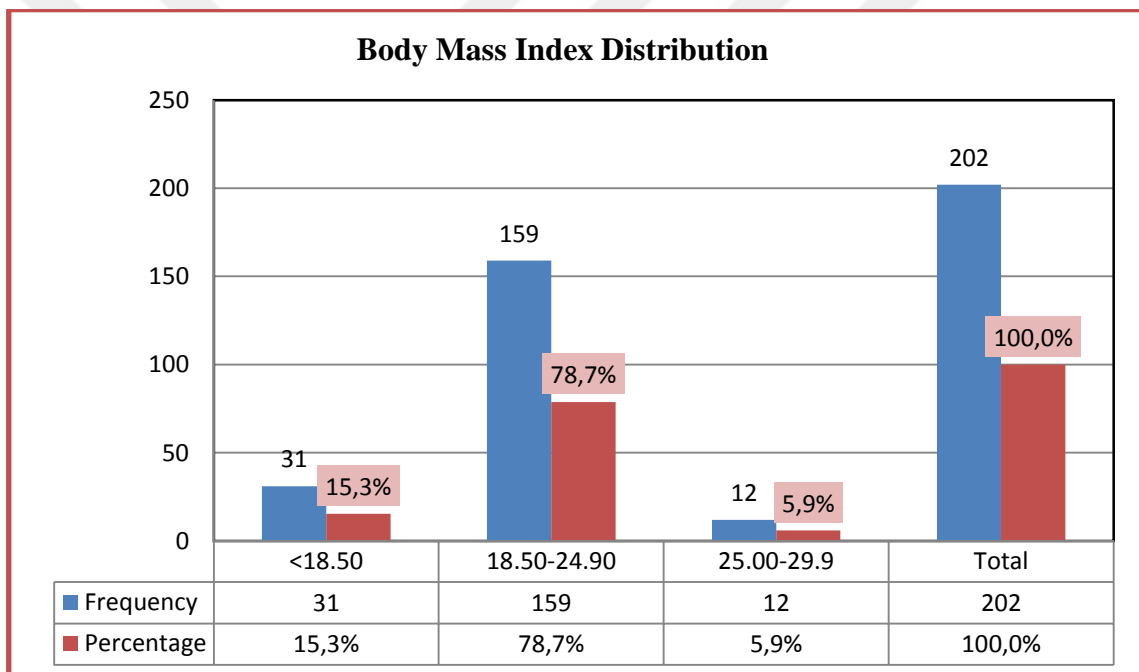


Table 14 describes all participants' EAT-40 point distributions. For assessment of test, total points obtained from test results are classified as follows: a score of 30 and above indicate high risk (abnormal eating behavior), between 21 and 30 indicate moderate risk and below 21 indicate low risk.

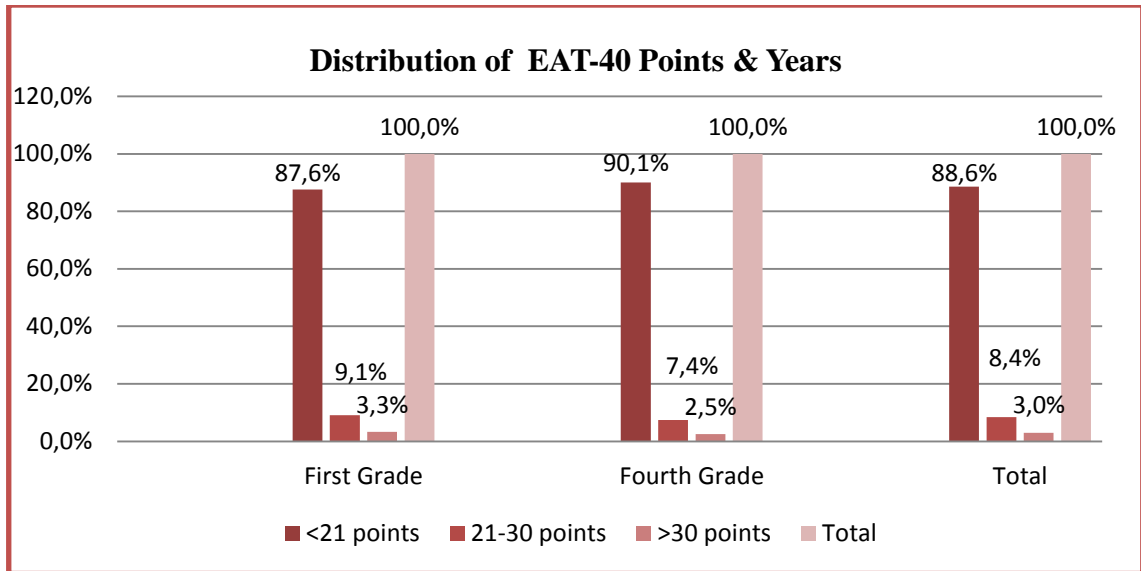
According to scale scoring, it was found that 17 nutrition and dietetics students (8.4%) showed moderate risk for developing eating disorder and 6 students (3%) exhibited abnormal eating attitude.

Table 15: Body Mass Index Distribution



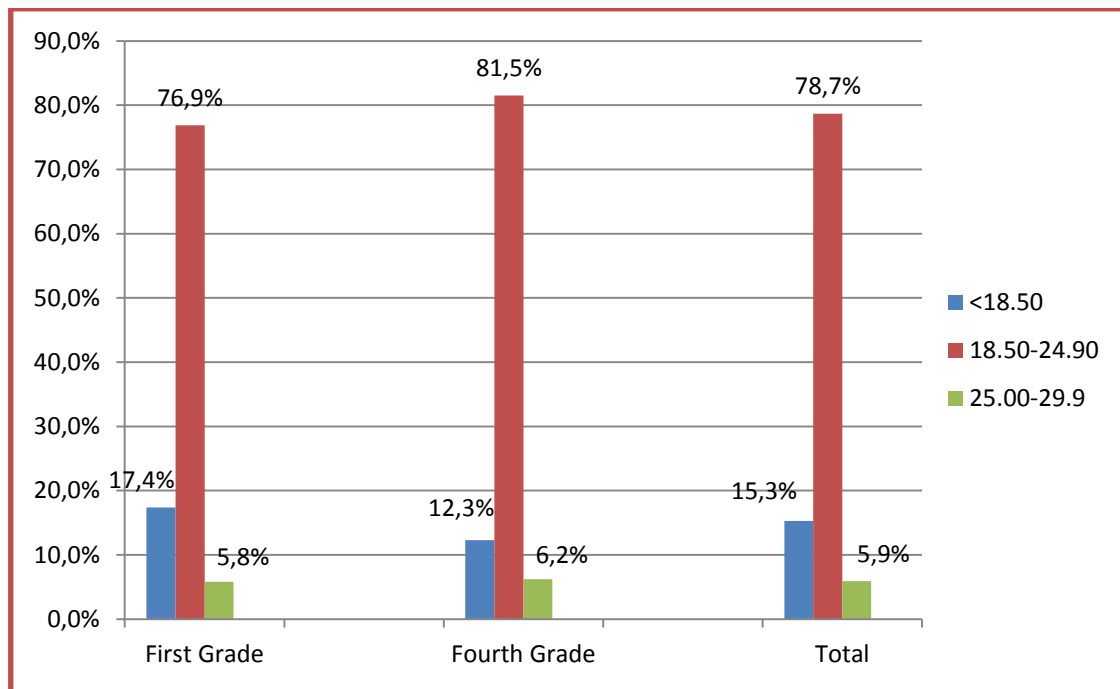
In this study, 78.7% of nutrition and dietetics students were found in normal BMI range. While 5.9% of students were in overweight group, obesity was not observed in nutrition and dietetics students.

Table 16: Distribution of EAT-40 Points According to Years of Nutrition and Dietetics Students



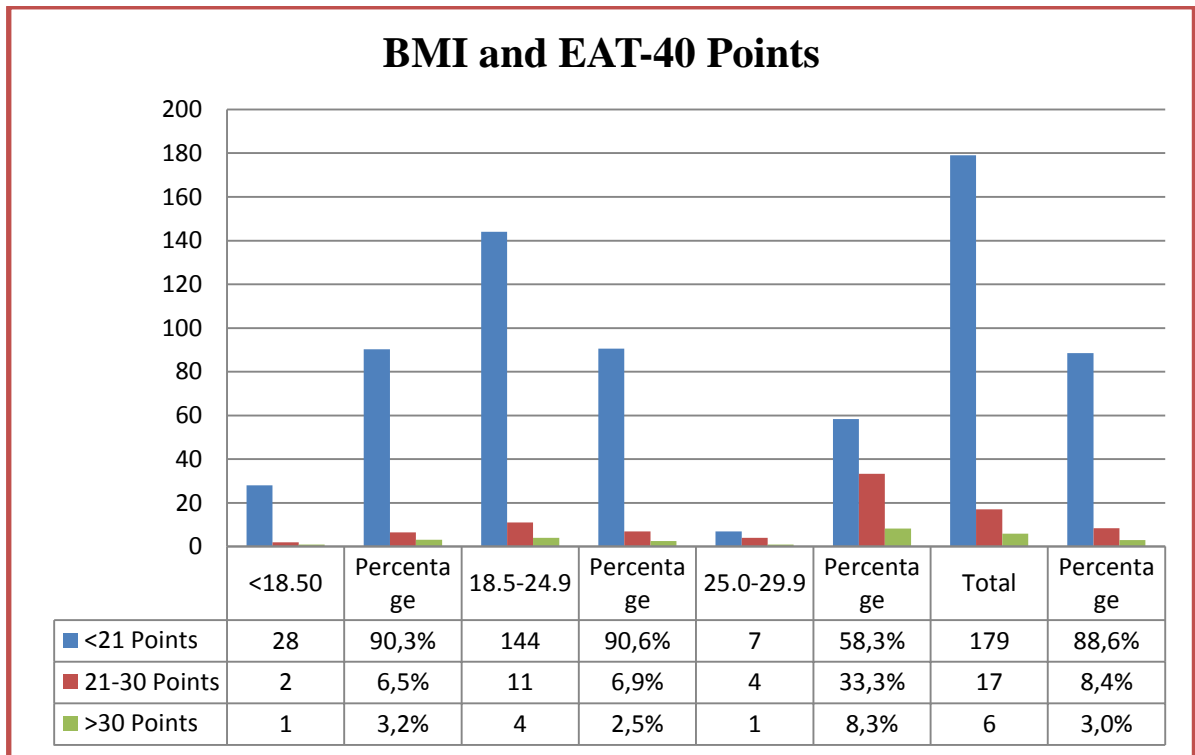
When eating disorder status of nutrition and dietetics students compared with one another, first year of nutrition and dietetics students showed that 3.3 % eating disorder behavior, 9.1 % of students had moderate risk for development of eating disorder; fourth year of nutrition and dietetics students indicated that 2.5 % eating disorder behavior, 7.4 % of students had moderate risk for development of eating disorder. Comparison between students' class and eating disorders behavior was not found significantly different ($p>0.05$).

Table 17: Distribution of BMI Score and Course Year



When students' BMI values were compared according to their class, there were determined that underweight group was high in first class (17.4%) and students with normal body weight were high in fourth class (81.5%). Overweight status was also slightly higher in the fourth class.

Table 18: Relationship between BMI and EAT-40 Points



In this study relationship between BMI and EAT-40 points was analyzed. According to other hypothesis of this study, students with high body mass index level indicate more disordered eating behaviors in spite of the students with normal body mass index level.

When analysis was evaluated, disordered eating behavior (above 30 points) were found to be highest in overweight group (8.3%). This results can support studies' hypothesis but on the other hand underweight group (BMI<18.5) also had high level of EAT-40 points (3.2%)

5. DISCUSSION

The main aim of the study was to investigate eating disorder status of nutrition and dietetics students and compare this situation according to year of course attended.

Changes in eating behavior of university students are common and widely studied. In Portugal, some studies identified these students as the most dissatisfied with their weight and the most concerned with weight gain and control^[1].

Several studies suggest that eating disorders or the risk for disordered eating behavior are more prevalent in dietetics or nutrition students when compared with students from other courses^[6].

Even considering data indicating that students of nutrition and dietetics present a higher prevalence of eating disorder behavior, the causal relationship still remains unknown. Some authors suggest that the contact with food issues and the belief that a good appearance will be important for future professional success may be favorable to a higher incidence of eating disorders in nutrition students^[6].

Santos et al. (2008) suggest that students from Dietetics and Nutrition, mostly women, appear to be particularly vulnerable to ED development. Odabaşı, Ersan, Hasbay & Tosun (2007) reported that even among students who received nutrition education professionally, the rate of abnormal eating attitudes and behaviors was 9,4%^[51].

On the other hand, Mealha et al. (2013) analyzed that there was a low risk of eating disorders development among DN students (4.2%)^[1]. Similarly, in the present study, which was conducted among 202 nutrition and dietetics students, the rate of eating disorders in students was found to be 3%.

According to Korinth (2009) and Santos (2008), this increased risk may be due to their knowledge on food, weight control and body composition. From this fact, the study was planned for investigation of eating disorder status of 1st and 4th year of DN students.

This study revealed the fact that risk of eating disorder decreased while nutrition knowledge and education level were improving. First year of nutrition and dietetics students showed that 3.3 % eating disorder behavior, 9.1 % of students had moderate risk for development of eating disorder; fourth year of nutrition and dietetics students indicated that 2.5 % eating disorder behavior, 7.4 % of students had moderate risk for development of eating disorder. The findings of these studies show that educational interference lead to decrease in people's eating disorder behavior. Comparison between students' course year and eating disorders behavior was not found significantly different ($p>0.05$).

According to Poinhos et al. (2015), there was no significant interaction between eating behavior and course year of DN students. This conclusion has parallel with the findings of this study^[6].

When assessment was made according to BMI, it was found that the overweight group had higher EAT-40 scores. Şanlıer et al. (2008) obtained similar results from their studies which were among Turkish university students^[3]. Guerdjikova, McElroy, Kotwal & Keck. (2007) determined that eating disorders are more prevalent among overweight individuals.

At the same time moderate risk group for development of eating disorder was also high in overweight group.

6. CONCLUSION

Although differences were not statistically significant, it was found that;

- Nutrition and Dietetics students showed low risk for development of eating disorder.
- Obesity was not found among these students.
- First grade nutrition and dietetics students showed high percentages of eating disorder when compared students with other class. Contrary to expectations, increased level of nutrition education and knowledge had negative effects on development of eating disorder.
- Abnormal eating behavior (above 30 points) was highest in overweight group (8.3%).

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