



Eating Disorders in Adolescence

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Abstract

Eating disorders are complex diseases that have a number of underlying causes. According to the WHO Text editions of the Diagnostic and Statistical Manual of Mental Disorders and the International Classification of Diseases and Related Health Problems, the three primary types of eating disorders are binge eating disorder, bulimia nervosa, and anorexia nervosa. Eating disorders are becoming dangerously more common everywhere. Additionally, the COVID-19 pandemic has led to a disruption in growth and an exacerbation of eating disorders. Several studies among adults with associated disorders have targeted the prevalence of associated diseases in the adolescent population. These studies have shed light on a wide range of adverse effects, including greater concern about appearance and weight, issues with social interaction, and emotional and behavioural issues. This review study emphasizes how crucial it is to understand the prevalence, danger signs, effects, and therapeutic strategies connected to adolescent eating disorders. Healthcare professionals and stakeholders may collaborate to assist in early intervention, thorough treatment, and preventative efforts to improve the well-being of adolescents impacted by eating disorders by raising awareness and understanding.

Keywords: Binge eating, Anorexia nervosa, Adolescence, Eating disorders, Well-being.

1. Introduction

The adolescent phase plays a crucial role in development, encompassing significant transformations in physiology, psychology, and emotions. Within this stage, the emergence of eating disorders among teenagers can have severe and long-lasting consequences for their physical and mental well-being [1]. These disorders, increasingly prevalent in recent decades, rank as the third most common chronic condition among adolescent females [2] Anorexia nervosa, characterized by severe food restriction, and bulimia nervosa, characterized by binge eating followed by compensatory behaviours like vomiting or fasting, are the two main subgroups of these disorders. Both Anorexia nervosa and Bulimia nervosa can lead to significant morbidity, impacting physical, mental, and social health.

However, when defining the diagnosis, course of treatment, or outcome of eating disorders, it is crucial to consider the specific characteristics of teenagers and the developmental process of adolescence. Researchers and clinicians must recognize the unique challenges and needs of teenagers when studying and treating eating disorders. By doing so, it can be ensured that effective interventions are developed and implemented to support the well-being of young

individuals struggling with eating disorders. As a result, adolescents and adult eating disorder patients need to be treated differently and independently [3].

A sizeable fraction of the world's population is afflicted with eating disorders, which are complicated mental health illnesses [4]. Several studies have shown that the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition,) was frequently utilized. [5]. These studies use rigorous approaches to collect accurate information on the occurrence and trends of eating disorders, such as extensive surveys, diagnostic interviews, and clinical evaluations [6].

The three eating disorders that are most often studied are binge eating disorder (BED), bulimia nervosa, and anorexia nervosa (AN). Studies constantly emphasize eating disorders' major influence on general health while discussing their prevalence [7]. According to estimates, 0.4 percent to 0.6 percent of females and 0.1 percent of men are affected with AN, with Western nations having a greater incidence. According to reports, BN is more common, affecting 0.1% of men and 1-2% of females [8].

1.1. Epidemiology of eating disorder

Being a female teenager or young adult is the first significant risk factor for having an eating problem that has been identified by epidemiological studies. Adolescence is a time of highest risk for eating disorders in women, who have a much higher risk than males [9]. Given the essential importance of biological elements to sex and teenage development, these results may not necessarily point to psychological influences; yet these patterns raise concerns about cultural factors that could have distinct impacts on men and women starting in adolescence. The influence of cultural norms on gender-specific ideals of body image has been proposed as an explanation for the observed epidemiological patterns in girls, who undergo substantial changes in weight, shape, and body fat distribution during their development. The impact of the thin-idealization culture cannot be overstated. [10].

2. Eating Disorder Types

2.1. Anorexia nervosa (AN)

Teenagers with anorexia nervosa (AN) may have serious health issues with all of their body's developing organ systems [11]. The continual accumulation of data on the detection and treatment of the many medical consequences is essential to the continued development of our knowledge of AN in adolescents. Some of these physiological issues may be permanent, even though many of them get better with nutritional therapy and eating disorder treatment. The long-term consequences of these medical conditions, which often initiate during the formative years of adolescence, remain uncertain [12].

AN is a disorder that poses a serious risk of mortality from cardiac problems. Adults with eating problems die from cardiac issues in one-third of cases. Such information is not available for teenagers with AN. According to the literature, electrocardiographic abnormalities are the most often seen anomalies in adolescents with eating problems. A slow heartbeat (sinus bradycardia), low voltage (prolonged QTc interval), orthostatic hypotension (low blood pressure while standing), high vagal tone, poor myocardial contractility, mitral valve prolapse (MVP), a thinned-out left ventricle, and silent pericardial effusion are all signs of these conditions [13].

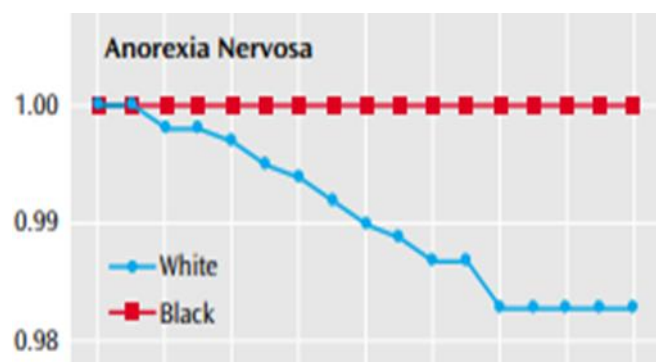


Fig 3: Survival Curves Showing Time to Onset of Anorexia Nervosa [14]

2.2. Binge eating disorder (BED)

In a major revision to the "Diagnostic and Statistical Manual of Disorders" (May 2013), binge eating disorder (BED) [15] was included as an empirically validated eating disorder (ED). The hallmark of BED is the recurrence of bouts of overeating without any accompanying compensatory behaviors. Furthermore, people with BED commonly express acute anxiety and subjective experiences of being out of control (LOC). The manual's mention of BED reflects the importance of the condition and the necessity for accurate diagnosis and treatment. Rapid physical and neurological changes occur in adolescents, which may be accompanied by heightened self-awareness and worry about appearance. Concern about being accepted by one's peers is on the rise as people become more conscious of the importance of peer connections and the cultural pressure to maintain a certain body type. While EDs are not age specific, they are more likely to manifest throughout adolescence. The start of BED has two distinct peaks: the first occurs shortly after the onset of puberty, at the age of 14, and the second occurs in late adolescence, between the ages of 18 and 20 [16].

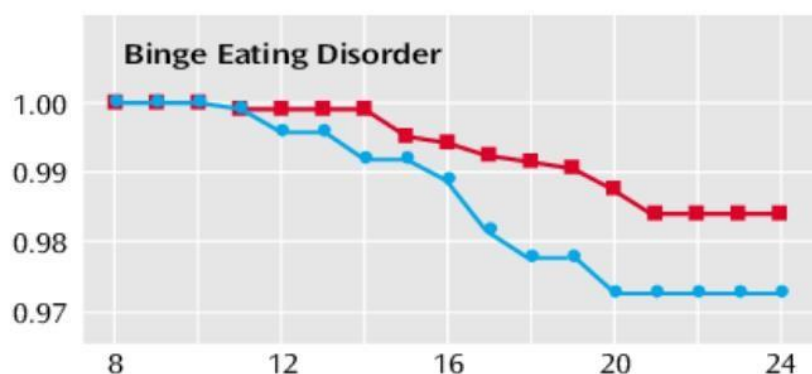


Fig 4: Survival Curves Showing Time to Onset of Binge eating disorder [17].

2.3. Bulimianervosa disorder (BN)

One of the most widespread mental disorders in women and the second most prevalent eating problem is bulimia nervosa [18]. Over 60% of patients who undergo first-line therapy for bulimia nervosa still have symptoms. Mortality rates are also much higher. Decreased information regarding the neurological mechanisms that underlie the initial manifestations of uncontrolled overeating, commonly referred to as binge eating.



Fig 5: Survival Curves Showing Time to Onset of Bulimia Nervosa [19].

2.4.Pica

Pica is a behavior that can develop as a coping technique for individuals with certain mental health conditions, such as schizophrenia and obsessive-compulsive disorder (OCD). In some cases, people with pica may develop a fondness and desire for the tastes or textures of non-food items. Interestingly, consuming clay is considered acceptable in certain cultures. [20].

2.5.Rumination disorder

Another eating disorder that has been recently discovered is known as rumination disorder. This disorder involves the regurgitation of food that has already been digested and swallowed. The individual then proceeds to re-chew the food and has the option to either re-swallow it or spit it out. This behavior commonly manifests within the initial 30 minutes following a meal. It is essential to acknowledge that individuals of all age groups, including infants, children, and adults, can be affected by this condition.

Table 1: Definition of major eating disorders [21]

Diseases	The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, or DSM-5-TR	ICD-11
Anorexia nervosa	Intense dread of gaining weight or becoming obese, persistent calorie intake limitation, or a change in how one perceives their own weight or appearance.	fast weight reduction or noticeably low body weight • An ongoing tendency of restricted eating • An incorrect perception of the individual's physical weight or form
Bulimia nervosa	Binge eating episodes that recur often, together with the employment of unsuitable coping mechanisms to avoid. For three months, there was at least one weekly episode of weight increase.	extreme fixation with one's body's weight and appearance; frequent, recurrent binge eating episodes; incorrect, repetitive attempts to prevent weight gain There was considerable discomfort associated with binge eating, it took place for a month, ideally once a week.
Binge eating disorder	A binge eating event that was frequent, distressing, and occurred at least once a week for three months.	Regular, reoccurring binge eating episodes; excessive obsession with body image; Binge eating caused substantial discomfort and happened at least once per week for amonth.

3. Comorbidities of Eating Disorders

- **Psychiatric Disorders**

Patients with eating problems often have psychiatric comorbidities. Bipolar disorder, drug and alcohol abuse, and mood and anxiety disorders are the most common mental comorbidities. Adolescent patients with eating disorders also exhibited 3-5 times greater lifetime suicidality rates. Morbidities aggravate the symptoms of eating disorders and have an impact on treatment outcomes, level of care, and dropout rates. As a result, eating disorders and co-occurring disorders must be included in treatment [22].

- **Obesity**

According to a study article, eating disorders were prevalent in thirty percent of those seeking therapy for weight management. Depending on the techniques of evaluation, individuals undergoing bariatric surgery had a clinical diagnosis of BED in a range of 4.2% to 47 percent of cases. Medical comorbidities associated with eating disorders encompass a broad range of conditions affecting various systems in the body. These include malignancies, such as migraines or epilepsy. Additionally, eating disorders are often accompanied by psychological comorbidities, including depression, anxiety, and obsessive-compulsive disorder. These various medical comorbidities highlight the complex nature of eating disorders and the importance of a comprehensive approach to their diagnosis and treatment [23].

- **Diabetes**

There is a two-way interaction between diabetes and food issues. Type 1 diabetes mellitus (T1DM) patients have a major risk of developing an eating problem than the general population. In teenage females with T1DM, eating problems occur twice as frequently as in their counterparts without T1DM. Studies have also found that patients with T1DM often experience a condition known as diabulimia, characterized by the intentional restriction or omission of insulin due to fear of weight gain [24]. Furthermore, heredity plays a significant role, accounting for 40-60% of the occurrence of eating disorders, indicating a potential genetic relationship and a hereditary tendency for the occurrence of certain conditions [25]. Factors, up to 40 percent of patients with T2DM engage in disordered eating practices. Comorbid patients with T2DM and binge eating disorder (BED) tend to have a greater Body Mass Index (BMI) compared to those without BED [26].

- **Metabolic Syndrome**

It occurs in conjunction with several eating disorders. Individuals who had the metabolic syndrome developed as adolescents, such as emotional or limited eating being two times more likely to occur, compared to patients without metabolic syndrome. In two investigations, over half of the individuals who were obese and had BED satisfied the criteria for the metabolic syndrome [27].

3.1. Mechanisms Underlying the Comorbidities

According to recent research, the risks of metabolic illnesses differ overall depending on the kind of eating problem. There is insufficient evidence that AN increase the chance of developing metabolic syndrome. Obesity risk is lowered, and T2DM risk may be lowered as well. Genetic links are the main justification. The research found significant associations between AN and lower BMI, less insulin resistance, absence of obesity, lower T2DM, and

higher levels of high-density lipoprotein (HDL) cholesterol based on single nucleotide polymorphisms (SNPs). [28].

To develop novel therapies, it is crucial to comprehend the molecular processes behind eating disorders and associated comorbidity with metabolic illnesses. Some processes have been put forward at the level of the person or the environment [29]. The presence of easily accessible and enticing food options, societal biases against being overweight, and the prevalence of idealized thin body images portrayed in social media could all contribute to the co-occurrence of eating disorders and obesity at the environmental level [30].

4. Risk Factors for Eating Disorders in Adolescence

Adolescent eating disorders may arise due to several risk factors. These include societal, psychological, and biological variables. According to biology, hormonal changes that occur throughout puberty may have an impact on body image issues and raise the risk of having an eating problem. A large part is also played by psychological elements including poor self-esteem, perfectionism, and body dissatisfaction. In addition, social elements including peer pressure, media impact, and societal pressure to be skinny might encourage harmful eating habits. (Table-1).

Category factors	Common Risk factors
Biological	<ul style="list-style-type: none"> • Genetics • Family history of EDs
	<ul style="list-style-type: none"> • Sex, age, alteration in serotonin activity • Early or late puberty
Psychological	<ul style="list-style-type: none"> • Personality trait • Mental health • History of physical, social, or sexual abuse • Trauma
Environmental	<ul style="list-style-type: none"> • Living in the rural area • Living in Western culture where being thin is considered. • Having been exposed to EDs in the environment
Social	<ul style="list-style-type: none"> • Teasing and bullying • Taking part in a hobby or a sport • Social pressure • History of dieting • Stressful life events or changes

4.1. Weight Concerns

Two comprehensive studies examining risk factors have highlighted weight concerns as a significant predictor of disordered eating [32]. Killen et al., 2018 conducted a four-year longitudinal study on high school girls, providing compelling evidence that weight concerns prospectively predicted the onset of previously unidentified eating disorders [33].

4.2. Personality Traits

Personality traits are psychological factors that influence our perceptions, reactions, and interactions with the environment [34]. They act as a link between a shared cultural context and individual differences, making certain individuals more susceptible to cultural risk factors than others. Only some girls who grow up in a society that is concerned with weight have weight issues, and only some of those girls who experience weight issues go on to develop eating disorders. This may be due to personality factors [35]. The propensity to suffer dysphoria, having poor self-esteem, and having a bad opinion of oneself are all subdomains of the larger personality construct known as negative emotionality, which has been linked to eating disorders. It's important to note that perfectionism may have both good and bad features, with clinical or maladaptive perfectionism which is linked to a higher risk of eating disorders [36].

4.3. Peers

It is proposed that sociocultural factors including peers, parents, and the media influence how people acquire eating-disordered attitudes and behaviors. Immediate subcultures can emit strong signals emphasizing the importance of conforming to the societal norm of thinness [37]. According to longitudinal research, eating disorders are more likely to develop in late adolescence. Potent signals about the need to adhere to the social norm of thinness may come from one's immediate subculture. These factors are believed to have a substantial impact on the development of eating disorders and problems with body image [38].

4.4. Gender

Women are up to 10 times more likely than males to have anorexia or bulimia, and they are 2.5 times more likely to develop binge eating disorders. Eating disorders may affect both men and women. Simply stated, investigation shows that females and young girls are more prone to have eating disorders [39].

Epidemiological data suggest that females have a greater rates of bulimia nervosa (BN) and anorexia nervosa (AN), highlighting a gender disparity in these disorders. However, the scenario is reversed for subthreshold binge eating disorder cases, where the prevalence is higher in males. Additionally, the prevalence of "binge eating" is nearly equal between genders. In terms of weight-related concerns, girls or women are more likely than boys or men to express dissatisfaction with their weight, engage in dieting for weight loss, and engage in purging behaviors. However, their likelihood of reporting binge eating and using excessive exercise as weight-loss strategies may be equal or lower [40].

4.5. Age

Eating disorders can impact individuals across all age groups, including young children and the elderly, for which eating disorders are most common. However, much research suggests that adolescence and early adulthood are the periods in which eating disorders are most common [41]. Consequently, the risk of developing eating disorders is higher for young women and adolescent girls, depending on their age (Fig 2) [42].

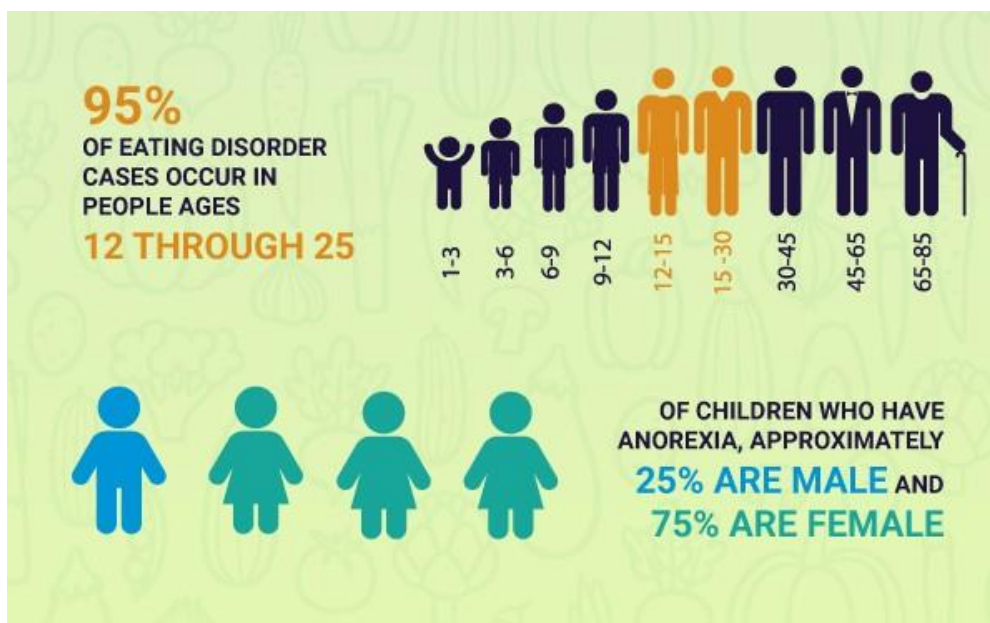


Fig 2: eating disorders in children and Teens [43].

4.6. Genetics

There is evidence that those who have a close relative who has had an eating problem, or another mental illness are more likely to have an eating disorder themselves. This implies that there are biological or genetic risk factors for eating disorders. Most studies of twins have shown that susceptibility to eating disorders has a heritability between twenty percent and eighty percent. Evidence of some heredity comes from studies of families and adoption as well. The prevalence of eating problems in modern Western culture is believed to be largely impacted by epigenetic changes [44]

5. Impact of COVID-19 on eating disorder

Eating problems have emerged and worsened as a result of the COVID-19 epidemic. In one research, eating disorder inpatient admission cases among youth (8–26 years old) in the US from 2018 to February 2021 were analyzed. Furthermore, it has been observed that eating disorder patients in Australia exhibited elevated instances of higher binge eating, restricting food intake, and engaging in excessive exercise during the COVID-19 period. These behaviors were documented as part of the impact of the pandemic on individuals experiencing eating disorders in the country [45].

6. Psychiatric consequences of eating disorder

Chronic illnesses like eating disorders have a significant effect on family life and psychosocial functioning. It's typical to have low self-esteem, inadequacy, social isolation, anxiety, and sadness. Age-appropriate socialization is hampered by an obsession with food and weight. Malnutrition may have contributed to depression, which **might** be so severe as to give rise to suicidal thoughts.

7. Diagnostic criteria

To evaluate if a patient has a certain illness or disease, medical experts employ a set of criteria known as diagnostic criteria. These standards have been developed based on in- depth study, clinical observations, and scientific proof. A study of eating patterns and behaviors is done to identify eating disorders.

7.1. Assessment Methods:

A skilled healthcare expert, such as a psychiatrist, psychologist, or registered dietitian, would normally undertake a thorough examination to make the diagnosis of an eating problem. The evaluation might include many of the following techniques:[46]

- **Clinical Interviews:**

Medical practitioners examine patients in-depth to learn about their eating habits, attitudes toward food, body image issues, and any accompanying medical or psychiatric complaints [47].

The physician would often start the clinical interview by getting a thorough history of the patient's eating disorder symptoms, including when they started, how they changed over time, and how severe they were. This data helps in creating a chronology and locating any possible stresses or triggering occasions that may have influenced the development of the eating problem.

The physician will also ask about the patient's eating habits, including dietary preferences, food limitations, and any instances of binge eating or purging. Accurate diagnosis and treatment planning depend on having a thorough understanding of the unique behaviors and rituals connected to eating disorders. The physician will ask the patient about their eating habits in addition to learning about their body image issues and views on weight and shape.

- **Psychological Assessments:**

The existence and severity of psychological symptoms, such as anxiety, sadness, and body dissatisfaction, may be assessed using a variety of psychological tests, including questionnaires and structured interviews.

To get a more comprehensive knowledge of the person's psychological functioning, psychologists may also utilize more general psychological exams in addition to these specialized ones. Measures of sadness, anxiety, self-esteem, and personality qualities may be included in these evaluations. Co-occurring mental health conditions that could be affecting the emergence or maintenance of the eating problem might be found by recognizing these variables [48].

- **Laboratory Tests:**

Lab testing is very important for the identification and treatment of eating disorders. These tests are crucial for determining a person's physical health as well as any underlying medical disorders connected to disordered eating habits. Laboratory testing provides important insights into the general health of people with eating disorders by examining several biochemical markers and hormone levels. Laboratory examinations, including blood testing, may sometimes be performed to evaluate any nutritional deficiencies, electrolyte imbalances, or other physiological indicators of an eating problem [49].

Additionally, electrolyte panel tests are frequently conducted to assess the levels of essential minerals such as sodium, potassium, and calcium in the bloodstream. Eating disorders, particularly those characterized by purging behaviors, can lead to electrolyte imbalances that may have severe consequences on the body's vital functions. Electrolyte panel tests help identify these imbalances and guide appropriate treatment interventions.

8. Eating disorder treatment and clinical recommendations

Currently, In the United States, the treatment of eating disorders often integrates the management of medical issues, psychosocial/psychiatric therapy, and dietary rehabilitation. This comprehensive approach aims to address the physical, psychological, and behavioral aspects of these disorders [50]. Traditional psychotherapies play a crucial role in this treatment approach. One such therapy is family-based therapy, which is designed for children and teenagers with eating disorders. It involves the active participation of the entire family in the treatment process. By involving the family, this therapy seeks to create a supportive and nurturing environment that facilitates recovery [51].

Another commonly used therapy is cognitive behavioral therapy (CBT), which targets the dysfunctional thought patterns and behaviors associated with eating disorders. CBT helps individuals identify and challenge negative beliefs and develop healthier coping mechanisms. CBT's (Cognitive behavioural therapy) goal is to enhance mental health by encouraging patients to alter their negative patterns of behavior. The goal of eating disorder therapy in the United States is to give a comprehensive and tailored approach to recovery, and this is accomplished by integrating these numerous techniques [52].

9. Conclusion

In conclusion, eating disorders are major mental diseases that may cause serious physical and mental illnesses in teenagers. These illnesses entail intricate and harmful interactions with food, eating, exercise, and body image. It is important to pay greater attention to and do more research on the comorbidities of eating disorders and metabolic illnesses because they pose novel clinical and public health issues. Treatment of eating disorders requires early recognition and intervention. Adolescent eating disorders are often treated using a multidisciplinary strategy that includes medical, dietary, and psychological therapies. To address the root issues, encourage good eating habits, and enhance body image perception, support groups, individual therapy, and family therapy are often used.

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