

Eating Disorders and their Implications on Oral Health – Role of Dentists

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Eating disorders (EDs) are primary psychological conditions, often associated with severing medical complications. EDs are characterized by perturbed eating behavior patterns. Their increasing incidence and prevalence is causing concerns to healthcare professionals. Because eating disorders are a complex issue, a multidisciplinary approach to treatment is required and this team includes Psychiatrists, Psychologists and Nutritionists. The purpose of this paper is to review the role of the dentists especially the pediatric dentist and orthodontist in identifying oral manifestations of EDs, which may be utilized for oral diagnosis, referral and management of underlying psychiatric condition and also secondary oral conditions.

Keywords: Eating disorders, Anorexia nervosa, Bulimia.

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INTRODUCTION

Eating disorders (EDs) are psychiatric illnesses associated with serious medical complications.^{1,2} Most of these EDs are characterized by disturbed self perception of body weight and shape and a desire to be thinner.¹⁻³ Disordered or Dysfunctional eating includes behaviors such as dieting, fasting, bingeing and skipping meals.¹ Eating disorders present unique psychiatric, medical, nutritional, and dental patterns.³ The cause of these eating disorders is unknown, however, genetic, cultural and psychiatric factors appear to play a role (Fig 1).⁴ EDs are commonly seen in teenage girls and are of increased prevalence in performing art groups.² Modeling, athletics, ballet dancing, and other hobbies and occupations emphasizing body shape, weight, and appearance appear to play a role in eating disorders.³ Eating disorders are a complex issue and require a multidisciplinary team approach to treatment and this team usually involves psychiatrists, psychologists, and nutritionists.²

The oral manifestations include increased levels of dental caries, sensitivity to hot and cold substances, dry mouth, enamel erosion and occasionally swelling of the parotid salivary gland.¹⁻⁵ These signs can develop within six months of

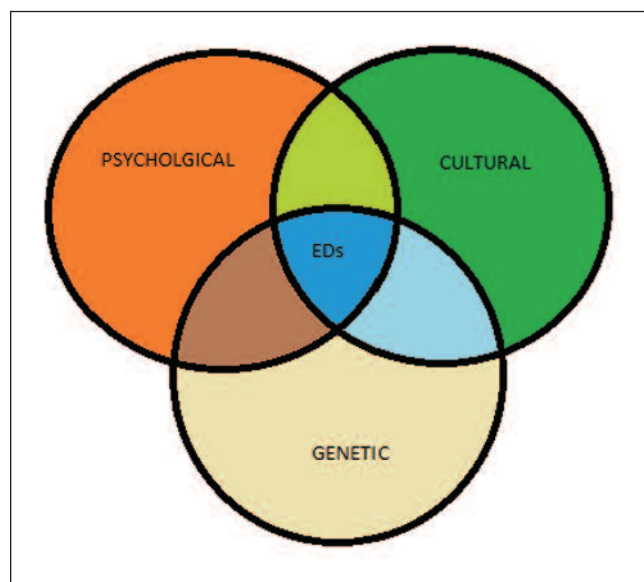


Figure 1. Causes of Eating Disorders (EDs)

the onset of disordered eating.⁵ Therefore the participation of a dentist in the treatment of eating disorders is fundamental in early diagnosis and referral.³ Also dental treatment should promote oral health and the esthetic characteristics of the dentition.³

Since around two decades a lot of papers have been published linking EDs and oral health. Most of these researches have been conducted by medical professionals and they have been published in medical literatures. It has been emphasized by many authors that it is usually the dentists who come in contact first with these individuals suffering from EDs. There has been a lack of publications or literature which is seen in our journals and relatively little literature are available on the impact of these conditions on the oral health.

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The purpose of this paper is to review the literature regarding the oral signs and symptoms of eating disorders and the paper also emphasizes on the benefits of involving the dental professionals especially the pediatric dentists and the orthodontists who deal with this particular age group prone to EDs, in the early identification, diagnosis, referral and treatment of these conditions.

American psychiatric association classifies three types of EDs diagnoses: Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Eating Disorders Not Otherwise Specified (EDNOS).⁶ The latter is a limited symptom variant of the complete syndrome; typically the individual meets most, but not all diagnostic criteria.

The international classification of diseases (ICD)¹⁹ includes AN, BN, atypical AN and BN (similar to EDNOS), vomiting associated with other psychological conditions and psychogenic loss of appetite.¹⁹ The authors have proposed a new classification compiling all the above components (Fig 2).

Prevalence

EDs are often severe conditions with elevated standardized mortality ratios and marked impairment.²⁰ Both AN and BN have a typical onset in late adolescence and early adulthood and are rare from a population perspective. However, they are more prevalent in certain groups. It is the third most common chronic illness of teenage girls. EDs are present in 1-4% of schoolgirls and university students especially girls.²¹ It has been reported that 86% of French adolescent girls have engaged at least once in self induced vomiting to control shape and weight.²²

Anorexia nervosa

Anorexia nervosa is characterized by intentional loss of weight due to an extreme aversion to food, strict diet in an unchecked pursuit of slenderness, obsessive fear of getting

fat, a grossly distorted self-image of the body, and alterations in the menstrual cycle.³ According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), four diagnostic criteria must be present to establish a diagnosis of anorexia nervosa.⁶

1. Refusal to maintain body weight at or above a minimally normal weight for age and height. Underweight is generally defined as weight less than 85% of that considered normal.
2. Intense fear of gaining weight or becoming fat. Some patients, whose self esteem depends on their weight and body shape, perceive themselves as overweight.
3. Distorted perception of body weight or shape.
4. Absence of at least three consecutive menstrual cycles in post-menarchal women caused by abnormally low levels of estrogen.

Since the 1980's the DSM-IV defines two subtypes of anorexia nervosa based on the presence or absence of regular binge eating or purging.⁶ In restrictive anorexia nervosa weight loss occurs primarily through caloric restriction and excessive exercise. The binge eating/purging type is characterized by regular binge eating and purging behavior. Some individuals with this subtype of anorexia nervosa do not binge eat but do purge after consumption of even small quantities of food.⁶

Bulimia nervosa

Bulimia nervosa is an eating disorder characterized by binge eating and purging behaviors. Individuals with this disorder consume large quantities of food in short periods of time and then they purge through self-induced vomiting.³ Bulimic patients usually do not present signs and symptoms of the disease and most of the patients show normal body weight, which is the most distinguishable characteristic to

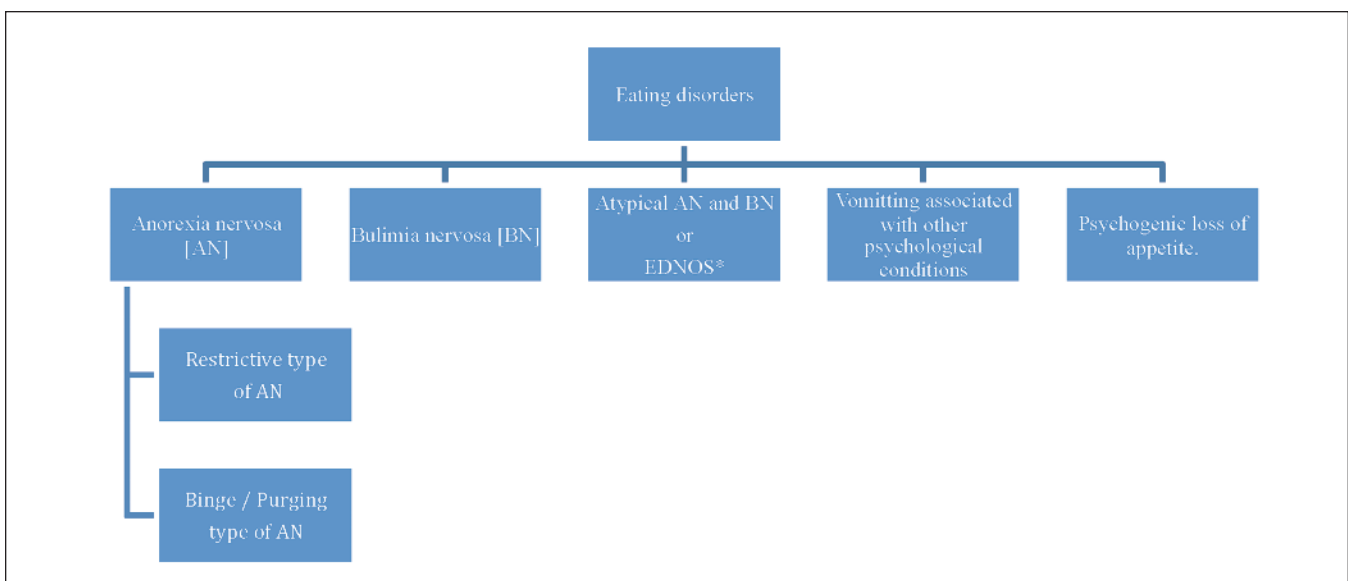


Figure 2. Classification of eating disorders. (*EDNOS- Eating disorders not otherwise specified)

differentiate anorexia nervosa from bulimia nervosa.³ According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), the criteria for bulimia nervosa are

1. Consumption of larger amount of food that is definitely larger than most people would eat during a similar period of time or circumstances (usually within any 2-hour period).
2. A sense of lack of control on eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).
3. Recurrent use of inappropriate compensatory behaviors to prevent weight gain, such as self induced vomiting after an episode of binge eating. The misuse of laxatives or diuretics and excessive exercise are also included as additional compensatory behaviors.
4. A morbid dread of becoming fat.

The literature indicates the risk for bulimia nervosa is associated with age, gender, and race. Most bulimic patients are women in late adolescent or early adult years.

Oral Manifestations of Eating Disorders

Eating disorders are a serious concern with regard to the oral health of patients. They represent a clinical challenge to dental professionals because of their unique psychological, medical, nutritional, and dental patterns. Dental erosion, xerostomia, enlargement of the parotid gland, and other dental implications might be present in individuals with eating disorders.^{3-5, 7-9}

EFFECTS ON HARD TISSUE

Tooth erosion

Erosion is an event in which the dental tissue is removed through a chemical process.³ Self-induced vomiting is the method most used by anorexic and bulimic patients to prevent them from gaining weight and is a destructive process that affects the hard dental tissues in the oral cavity.³ The chronic regurgitation of gastric contents causes enamel erosion and demineralization.^{2,4} Enamel erosion is the most common oral manifestation of chronic regurgitation typical of eating disorders.^{3,4} Patients exhibit a classic erosion of the lingual surfaces of maxillary teeth.³ This specific type of enamel erosion is termed perimylolysis and is defined as the erosion of enamel on the lingual, occlusal, and incisal surfaces of the teeth as a result of chemical and mechanical effects caused mainly by regurgitation of gastric contents and activated by the movements of the tongue (Fig 4).³ There is a consensus that dental erosion is not detected until vomiting behaviors have occurred for at least two years of self-induced vomiting, although there is a study showing dental erosion after a six month period of purging.²³ Usually, dental erosion and dentin exposure are followed by pain, due to dentin hypersensitivity.⁴ This influences the patient's eating behavior and oral hygiene.¹⁰



Figure 4. Dental erosion

The severity of dental erosion depends on the duration of purging incidents per day, frequency of purging incidents *per day*, oral hygiene habits (especially following a vomiting incident), the degree of acid dilution by means of water rinsing or drinking neutralizing liquids such as milk, and timing of tooth cleaning.³

Differentiating active erosion lesions from inactive ones may be important to determine whether the induced vomiting has been discontinued. Active erosions are smooth and unstained and generally are not sensitive to either cold or hot stimuli.²⁴ When self-induced vomiting ceases; the exposed dentin on the palatal surfaces of the teeth becomes stained over the course of time indicative of inactive lesions.²⁴

It is also important to differentiate between erosions caused by eating habits and those caused by habitual vomiting. Buccal or facial surface erosion may result from an over consumption of highly acidic foods. This is particularly true of raw citrus fruits consumed in excess by anorexia nervosa patients because they are low calorie foods with high acidity which adversely affect the dentition whereas erosions which occur as a result of vomiting occur on the lingual surfaces as described previously.²⁵

Finally, patients with anorexia nervosa and bulimia nervosa may consume more acidic drinks and foods as well as engage in parafunctional habits, thus, being susceptible to dental erosions.²⁶

Dental caries

Dental caries becomes a problem in individuals whose diet is rich in cariogenic food, have poor oral hygiene, and manifest salivary disturbances.^{2,3} Some studies reported that anorexics exhibit a high caries rate.^{11,12} Others reported the incidence of caries in anorexia nervosa patients was similar to the incidence in the non-affected population.^{13,14} The differences in caries rates among eating disorder patients can be attributed to personal characteristics, such as the individual's oral hygiene, malnutrition, fluoride experience during tooth development, cariogenicity of the diet, genetic predisposition, and ingestion of certain types of medications.^{3,14}

Antidepressants prescribed for the management of psychiatric aspects of EDs are profound antisialagogues, which significantly increases the caries risk.²

The only eating-disorder patients who may show significant increases in caries rates are those with a binge-eating disorder due to the consumption of high caloric and high-carbohydrate foods. Typically, most people eat five to six times a day but when that frequency increases significantly, the caries risk also increases.²⁸ Because dental caries in eating disorder patients is a complex, multifactorial, and controversial subject, investigations should include the analysis of diet, salivary issues, and details of behavioral purgative episodes of self-induced vomiting.^{2,3}

EFFECTS ON SOFT TISSUES

Effects on Gingiva and Periodontium

As with caries, data regarding the periodontal status of eating-disorder patients are inconsistent. The etiology of periodontal disease is complex and multifactorial. Any factor that influences the composition of the microbiota, host-soft tissue repair mechanisms or host-defense mechanisms, may have an influence on the onset and progression of periodontal conditions.^{2,3}

As most of the eating disorder patients are young, it is not surprising that advanced periodontal disease is rarely diagnosed. Poor oral hygiene has been reported more commonly in anorexia nervosa patients than in bulimia nervosa patients but without statistical significance.²⁹ This observation is particularly true if depression accompanies the eating-disorder. It is also stated that anorexics are less interested in oral hygiene practices than bulimics. This lack of interest may be caused by the more serious psychopathologic nature of anorexia nervosa. Because bulimia nervosa patients may have a more realistic body image and may be more concerned about their appearance, they might be more likely to take meticulous care of their teeth and gingival tissues.³⁰

Effects on oral mucosa

Trauma to the mucosal membranes, pharynx, and soft palate can be observed in patients engaged in binge eating and self-induced vomiting.^{2,3,15,16} The trauma can be caused by the foreign objects used to induce vomiting.^{2,3,15,16} Many oral mucosal lesions are related to nutritional deficiencies that can impair the repair and regenerative potential of the oral mucosa. Angular cheilitis occur as a consequence of malnutrition and trauma.^{2,3} Oral candidiasis is associated with both nutritional deficiencies and salivary dysfunction.^{2,17} Also mucosal lesion occurring as a result of trauma may secondarily be infected with candidiasis. Oral ulcerations and glossitis may present as a result of hypovitaminosis- B 12, iron and folate deficiency.^{2,17}

EFFECTS ON SALIVARY GLANDS

Xerostomia

The effects of eating disorders on salivary glands, saliva,

and serum amylase levels constitute the most studied topics.³ Xerostomia is a common side effect of the many psychotropic medications prescribed for eating disorder patients.³ Additional factors such as fluid imbalance caused by overuse of diuretics and laxatives taken to prevent weight gain and persistent vomiting may be contributory.³ Several investigators reported reduced rates of unstimulated salivary flow in patients who binge eat or induce vomiting, however, no reductions in stimulated salivary rates were observed.³¹ This indicates there is no alteration in the secretion of salivary glands but rather smaller quantities of saliva are secreted due to the ingested medicaments.³¹ Many antidepressants have antisialagogue effects resulting in xerostomia.² Studies also have shown decreased flow of saliva¹²⁻¹⁴ which is associated with increased caries risk, susceptibility to oral infections and taste disturbance.²

Salivary Gland Swelling

Sialadenosis, salivary gland swelling is seen most commonly in patients with EDs.^{2,3,15,18} Swelling predominantly affects parotid gland.^{2,3} Generally, this finding is manifested in individuals who purge. In the early stages of the eating disorder, gland enlargement may be intermittent and reversible.^{2,3,15,18} Upon palpation, the gland is soft and generally painless.^{2,3}

In the early stages of the eating disorder, gland enlargement may appear and disappear; but as the eating disorder progresses, the swelling becomes more persistent. Facial deformity presents a widened and square appearance to the mandible which may become a complicating factor in the overall psychological state of an eating disorder patient.³¹ The etiology of salivary gland enlargement is uncertain.³² Most investigators have associated parotid enlargement with recurrent vomiting.³³ Cholinergic stimulation of the glands during vomiting or autonomic stimulation of the glands by activation of the taste buds are the mechanisms proposed for this salivary gland swelling.³³

Dermatologic Signs in Patients with Eating Disorders

Dermatologic symptoms are almost always detectable in patients with severe anorexia nervosa (AN) and bulimia nervosa (BN), and awareness of these may help us dentists also in the early diagnosis of hidden AN or BN. Cutaneous manifestations are the expression of the medical consequences of starvation, vomiting, abuse of drugs (such as laxatives and diuretics), and of psychiatric morbidity. These manifestations include xerosis (dry skin), lanugo-like body hair, telogen effluvium (a form of non scarring alopecia), carotenoderma (yellowish orange discoloration of skin), acne, hyperpigmentation, seborrheic dermatitis.³⁴

The most characteristic cutaneous sign of vomiting is Russell's sign (knuckle calluses), defined as calluses on the knuckles or back of the hand due to repeated self-induced vomiting over long periods of time. The condition generally arises from the afflicted's knuckles making contact with the incisor teeth during the act of inducing the gag reflex at the back of the throat with their finger(s) (Fig 3).³⁵

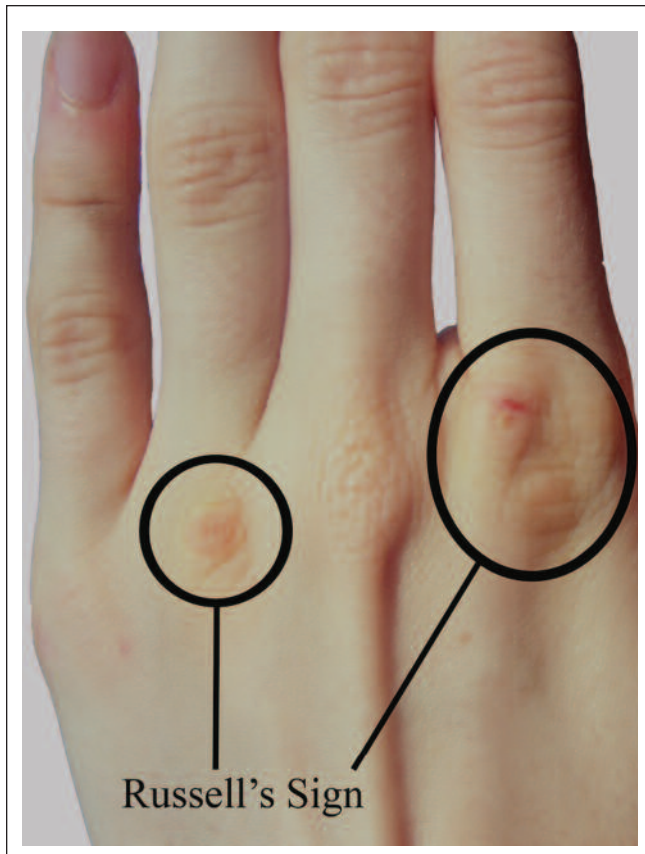


Figure 3. Russell's Sign

Anyways, Bulimics who are capable of “handsfree purging,” or the induction of vomiting by the willful opening of the esophageal sphincter in a manner similar to belching, while contracting the stomach muscles, do not have Russell's sign.^{34, 35}

CONCLUSIONS

Eating disorders, such as anorexia nervosa and bulimia nervosa, are a serious concern with regard to the oral health of patients and a clinical challenge to dental professionals. Eating disorders present unique psychiatric, psychological, medical, nutritional, and dental patterns. However, there is a lack of awareness of the fundamental importance of the dentist's participation in multidisciplinary treatment of affected patients. Dentists are recognized as some of the first health care professionals to whom a previously undiagnosed EDs may present, and as such need to be aware of oral symptomatology other than dental erosion, which takes months to years to become apparent.

The dental team especially the general dental practitioners, pediatric dentists and orthodontists are the specialties of dentistry which will be dealing with these individuals for their dental concerns, and therefore they definitely and necessarily need to be updated and be a part of the multidisciplinary team providing treatment with a favorable prognosis.

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