



**ORAL MANIFESTATION OF PSYCOSOMATIC DISORDER IN WOMEN-A CASE  
CONTROL STUDY**

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DOI: <https://doi.org/10.5281/zenodo.19413467>



**How to cite this Article:** \*<sup>1</sup>Dr. Dimple Singh, <sup>2</sup>Dr. Hina Handa, <sup>3</sup>Dr. Anukrati Molasari, <sup>4</sup>Dr. Christopher Shinde, <sup>5</sup>Dr. Akshay Agrawal, <sup>6</sup>Dr. Gaurav Arya, <sup>7</sup>Dr. Shweta Chaturvedi (2026). Oral Manifestation Of Psychosomatic Disorder In Women-A Case Control Study. European Journal of Biomedical and Pharmaceutical Sciences, 13(4), 299–304.

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Article Received on 05/03/2026

Article Revised on 25/03/2026

Article Published on 04/04/2026

### ABSTRACT

**Introduction:** Eating disorders are complex psychiatric conditions with significant systemic and oral health implications, particularly among women. This cross-sectional study aimed to evaluate the association between eating disorders and oral health status in women aged 15–45 years. A total of 200 participants were included, comprising 100 cases screened positive for eating disorders using the SCOFF questionnaire and 100 healthy controls. Demographic data, eating behaviors, and comprehensive oral examinations were recorded using standardized indices. **Results:** showed a significantly higher prevalence of oral manifestations among cases compared to controls (50% vs 0%,  $p < 0.001$ ). Dental erosion was the most common finding (32%), followed by attrition and abrasion. Oral mucosal lesions such as atrophic mucosa and angular cheilitis were also prevalent, reflecting nutritional deficiencies. Other findings included xerostomia, periodontal disease, dental caries, and salivary gland swelling. All associations were statistically significant ( $p < 0.001$ ). **Conclusion:** The study highlights a strong link between eating disorders and deteriorating oral health. Early recognition of these manifestations by dental professionals can aid in timely diagnosis, referral, and multidisciplinary management, improving overall patient outcomes.

**KEYWORDS:** Eating disorders, Oral manifestations, SCOFF questionnaire.

### INTRODUCTION

Eating disorders represent a group of complex psychiatric conditions characterized by disturbed eating behaviors, altered body image, and excessive concern with body weight and shape. These disorders, which include anorexia nervosa, bulimia nervosa, and binge-eating disorder, predominantly affect women, particularly during adolescence and early adulthood.<sup>1</sup> The multifactorial etiology of eating disorders involves psychological, biological, and sociocultural factors, and their prevalence has been increasing globally, making

them a significant public health concern. Understanding how to recognize the or implications and manifestations of eating disorders and how to implement appropriate screening tools (like SCOFF) are critical in helping patients receive the treatment required for recovery.

Eating disorders are associated with a wide range of systemic complications affecting the gastrointestinal, cardiovascular, endocrine, and musculoskeletal systems. Among these, oral and dental manifestations are often early and easily detectable signs yet they remain under-

recognized in routine clinical practice.<sup>2</sup> Recurrent vomiting, restrictive dietary habits, nutritional deficiencies, dehydration, and the use of laxatives or appetite suppressants contribute significantly to compromised oral health in affected individuals.<sup>[1,2]</sup>

The oral cavity is particularly vulnerable to the effects of eating disorders. Frequent exposure to gastric acid due to self-induced vomiting can lead to dental erosion, hypersensitivity, and increased susceptibility to dental caries. Nutritional deficiencies, especially of iron, vitamin B complex, and folic acid, may result in atrophic changes of the oral mucosa, angular cheilitis, glossitis, and recurrent oral ulcerations. Reduced salivary flow, often secondary to dehydration, medication use, or salivary gland dysfunction, can further exacerbate oral health deterioration by increasing the risk of caries, periodontal disease, and oral malodor.<sup>[3]</sup>

Women with eating disorders often present late for treatment due to stigma, denial of illness, or lack of awareness, making early identification crucial. Dental professionals are uniquely positioned to identify early oral signs suggestive of eating disorders during routine dental examinations. However, limited data exist regarding the spectrum of oral manifestations and their association with eating disorders in women, particularly in the Indian population.<sup>[4,5]</sup>

Understanding the relationship between eating disorders and oral health status is essential for improving early detection, interdisciplinary collaboration, and comprehensive patient care. Therefore, the present study aims to evaluate the oral health status and its association with eating disorders in women, highlighting the role of oral healthcare professionals in screening, prevention, and referral for appropriate medical and psychological management.

## MATERIALS AND METHODS

### Study Design and Study Population

This case control study designed in accordance with Helsinki's guidelines was conducted in the Department of Oral Medicine and Radiology, People's Dental Academy between April 2024 to November 2025. Women aged between 15 and 45 years diagnosed with or suspected of having eating disorders on the basis of SCOFF Criteria and attending the outpatient department during the study period were included. Prior to participation, the purpose and procedure of the study were explained to all participants and written informed consent was obtained. Ethical approval was obtained from the Institution Ethical Committee before commencement of the study. For all participants demographic details, medical history, dietary habits and information related to eating behavior were taken followed by SCOFF screening questionnaire and further comprehensive oral examination was done.

The subjects were divided into two main groups, Group 1 with 100 (Case) that is women diagnosed with eating disorder according to SCOFF Criteria and 100 (Control) included healthy individual which include three different groups such as Group (a) included (dental hard tissue involvement) Attrition, abrasion, erosion etc. Group (b) included Oral Ulcerative and Mucosal Lesions such as - Atrophic lesions, Angular cheilitis, Atrophic tongue etc while Group (c) included Other Oral Manifestations such as Xerostomia, Salivary gland swelling, Periodontal diseases etc. Further subjects were allocated through SCOFF screening questionnaire used to screen participants for eating disorders.<sup>[12]</sup> SCOFF is an acronym representing five validated screening questions that can be remembered through the mnemonic, Sick, Control, One Stone, Fat and Food.

The questions are as follows:

1. Do you make yourself sick because you feel uncomfortably full?
2. Have you recently lost more than one stone (14 pounds) in a three-month period?
3. Do you believe yourself to be fat when others say you are healthy?
4. Would you say that food dominates your life?
5. Do you worry that you have lost control over how much you eat?

A yes response equals one point. Two or more points indicates the presence of an eating disorder.

Standardized dental indices were used as part of the clinical examination to aid in the detection and assessment of oral manifestations associated with eating disorders. Examples of tooth erosion indices include Lussi's index-modified version of Linkosalo and Markkanen index assesses dentin exposure. The Tooth Wear Index modified by de Carvahalo Sales-Peres et al examines tooth wear via a grade. The BEWE assesses teeth by sextants, categorizing risk level and providing specific treatment for each category while the Olio et al index measures occlusal wear.<sup>[13]</sup>

Descriptive statistics were calculated for quantitative variables (mean, standard deviation, maximum and minimum values). For qualitative variables, the distribution of absolute frequencies and percentages was determined for the whole sample and for the two groups. The chi-squared test and the Fisher exact test were applied to analyze associations between qualitative variables: for quantitative variables Student's t-test was used, and ANOVA when necessary. Statistical significance was established as  $p < 0.05$  (confidence level  $> 95\%$ ). Standardized effect size measures were calculated through the Pearson correlation coefficient and Cramer's Vs by means of SPSS version 27 software to reach conclusive results.

## RESULTS

In Demographic Characteristics of Study Participants- The age distribution was comparable between cases and controls ( $p=0.742$ ). However, BMI distribution showed significant differences ( $p<0.001$ ), with 42% of cases being underweight compared to only 8% in controls, reflecting the restrictive eating patterns characteristic of eating disorders. Among cases, 38% had chronic eating disorders lasting more than 12 months (Table 1).

This was followed by SCOFF Questionnaire distribution in which all five SCOFF questions showed highly significant differences between cases and controls ( $p<0.001$ ). The highest affirmative response among cases was for Q3 (body image distortion, 85%), followed by Q4 (food preoccupation, 78%) and Q5 (loss of control, 74%). Self-induced vomiting (Q1) was reported by 68% of cases, indicating a substantial proportion with purging behaviors. All cases scored  $\geq 2$  on SCOFF, confirming the screening criteria, while no controls met this threshold (Table 2).

Distribution of Oral manifestation in cases and control- The presence of oral manifestations was significantly higher in cases compared to controls (50% vs 0%,  $p<0.001$ ). Among the 100 cases, 50 women (50%) presented with at least one oral manifestation, while the

remaining 50 (50%) showed no oral findings. In stark contrast, none of the controls exhibited any oral manifestations.

**Dental hard tissue involvement**- was the most prevalent category (38%), with dental erosion being the most common specific finding (32%), followed by attrition (18%) and abrasion (15%). This pattern is consistent with repeated acid exposure from self-induced vomiting and nutritional deficiencies.

**Oral mucosal lesions** were observed in 28% of cases, with atrophic mucosa (16%) and angular cheilitis (14%) being the most frequent manifestations, likely reflecting nutritional deficiencies (iron, B vitamins, folic acid).

**Other oral manifestations** were present in 34% of cases, with xerostomia being the most common (24%), followed by periodontal disease (22%), dental caries (20%), and salivary gland swelling (18%). These findings suggest multifactorial oral health deterioration involving salivary dysfunction, poor oral hygiene, and metabolic disturbances.

All oral manifestation categories and individual findings showed highly significant associations with eating disorders ( $p<0.001$  for all comparisons) (Table 3).

**Table 1: Demographic characteristic of study participants.**

Characteristic	Category	Cases (n=100)	Controls (n=100)	p-value
Age (years)	15-25	45	40	0.742
	26-35	35	38	
	36-45	20	22	
BMI (kg/m <sup>2</sup> )	<18.5 (Underweight)	42	8	<0.001*
	18.5-24.9 (Normal)	48	78	
	$\geq 25$ (Overweight)	10	14	
Duration of ED	<6 months	28	0	N/A
	6-12 months	34	0	
	>12 months	38	0	

ED-Eating Disorder; BMI-Body mass index; Statistically significant  $p<0.05$

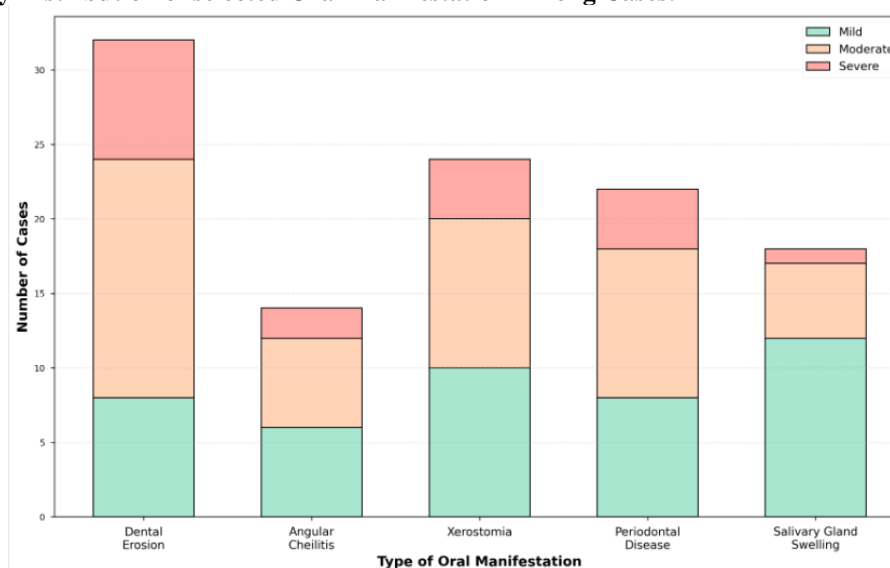
**Table 2: SCOFF Questionnaire Response Distribution.**

SCOFF Question	Cases - Yes (%)	Cases - No (%)	Controls - Yes (%)	Controls - No (%)	Chi-square	p-value
Q1: Make yourself sick?	68	32	0	100	92.31	<0.001*
Q2: Lost >14 lbs in 3 months?	72	28	0	100	103.45	<0.001*
Q3: Believe you are fat?	85	15	0	100	145.76	<0.001*
Q4: Food dominates life?	78	22	0	100	121.88	<0.001*
Q5: Lost control over eating?	74	26	0	100	109.52	<0.001*
SCOFF Score $\geq 2$ (Positive)	100	0	0	100	200.00	<0.001*

**Table 3: Distribution of Oral Manifestation in case and controls.**

Oral Manifestation Category	Cases (n=100) n (%)	Controls (n=100) n (%)	Chi-square	p-value
Any Oral Manifestation Present	50 (50.0%)	0 (0.0%)	100.00	<0.001*
No Oral Manifestation	50 (50.0%)	100 (100.0%)		
<b>Group A: Dental Hard Tissue Involvement</b>	<b>38 (38.0%)</b>	<b>0 (0.0%)</b>	<b>46.15</b>	<b>&lt;0.001*</b>
- Dental Erosion	32 (32.0%)	0 (0.0%)	38.10	<0.001*
- Attrition	18 (18.0%)	0 (0.0%)	19.78	<0.001*
- Abrasion	15 (15.0%)	0 (0.0%)	16.22	<0.001*
<b>Group B: Oral Mucosal Lesions</b>	<b>28 (28.0%)</b>	<b>0 (0.0%)</b>	<b>32.56</b>	<b>&lt;0.001*</b>
- Atrophic Mucosa	16 (16.0%)	0 (0.0%)	17.39	<0.001*
- Angular Cheilitis	14 (14.0%)	0 (0.0%)	15.22	<0.001*
- Glossitis/Atrophic Tongue	12 (12.0%)	0 (0.0%)	12.77	<0.001*
- Recurrent Oral Ulcers	10 (10.0%)	0 (0.0%)	10.53	0.001*

Note: Patient may have multiple oral manifestation, percentage calculated from total n=100 in each groups Statistically significant  $p < 0.005$

**Table 4: Severity Distribution of selected Oral Manifestation Among Cases.**

Among cases with specific oral manifestations, severity assessment revealed varying patterns:

**Dental erosion** showed a predominantly moderate severity (50%), with equal proportions of mild and severe cases (25% each), indicating substantial enamel loss in the majority of affected individuals.

**Angular cheilitis** and **xerostomia** showed balanced distributions between mild and moderate severity (approximately 42% each), with fewer severe cases.

**Periodontal Disease** demonstrated moderate severity in the majority (45.5%), suggesting progressive gingival and periodontal involvement.

**Salivary gland swelling** was predominantly mild (66.7%), with very few severe cases (5.6%), likely representing early-stage sialadenosis.

## DISCUSSION

Eating disorders are complex psychiatric illnesses with well-documented systemic consequences; however, their impact on oral health remains underexplored, particularly among women in developing countries. The present case control study was undertaken to evaluate the association between eating disorders and oral health status in women aged 15 to 45 years, highlighting the diagnostic potential of oral manifestations as early indicators of these disorders. The findings of this study demonstrate a significantly higher prevalence of oral and dental abnormalities among women screened positive for eating disorders using the SCOFF questionnaire when compared to the control group.<sup>[6]</sup> This supports the growing body of evidence that oral manifestations are common and clinically relevant features of eating disorders and may serve as early warning signs, often preceding overt systemic complications.

In the present study, dental hard tissue involvement—including erosion, abrasion, and attrition—was significantly more prevalent among cases than controls. Dental erosion, in particular, was strongly associated with eating disorders, likely due to repeated exposure of tooth surfaces to gastric acid during self-induced vomiting. These findings are consistent with previous studies that have identified dental erosion as a hallmark oral manifestation of bulimia nervosa and other purging behaviors.<sup>[7]</sup> The palatal surfaces of maxillary teeth are especially susceptible to acid-induced demineralization, leading to hypersensitivity and increased risk of caries.

Restrictive dietary patterns and frequent consumption of acidic foods or beverages, commonly reported in individuals with disordered eating, may further exacerbate enamel loss. Additionally, parafunctional habits and nutritional imbalances may contribute to attrition and abrasion, compounding the cumulative damage to dental hard tissues. The study also revealed a higher prevalence of oral mucosal lesions such as atrophic mucosa, angular cheilitis, glossitis, and

recurrent oral ulcerations among the eating disorder group. These findings can be attributed to nutritional deficiencies, particularly of iron, folic acid, and vitamin B complex, which are commonly observed in individuals with restrictive eating behaviors or malabsorption secondary to purging.<sup>[8]</sup>

**A clinical study done by K Enzell et al.** aimed to investigate correlations between the oral status of patients undergoing treatment at a specialized outpatient psychiatric clinic for eating disorders and various variables, including psychiatric diagnosis, duration of illness, oral hygiene habits and dietary habits. Healthy volunteers of similar age were recruited for comparison.<sup>[9]</sup> Clinical and radiographic examinations, standardized intraoral photographs, study models, and salivary analysis were conducted.

Atrophic changes of the oral mucosa and tongue may reflect chronic malnutrition and anemia, while angular cheilitis is often associated with deficiencies of riboflavin and iron. Similar observations have been reported in earlier studies, reinforcing the role of oral mucosal changes as indicators of underlying nutritional compromise in eating disorders. Xerostomia and salivary gland swelling were more frequently observed among cases in the present study. Reduced salivary flow may result from dehydration, electrolyte imbalances, or the use of medications such as antidepressants and appetite suppressants.<sup>[10]</sup>

**Studies by Deniz Firat et al** in which 72 women with EDs and healthy controls matched by age, sex, educational status, and smoking status were included in the project. Standardized full-mouth intraoral periapical radiography with a bisecting-angle technique and digital panoramic imaging were performed in all participants. The ED group consumed a larger daily amount of acidic beverages than the controls and a significant positive correlation was observed between the daily acidic-beverage intake and the frequency of vomiting.<sup>[11]</sup> In the ED group the mean number of teeth with untreated carious lesions particularly in the posterior mandibular region and periapical pathologies requiring treatment were significantly higher compared with healthy individuals.

Salivary gland enlargement, particularly of the parotid glands, has been widely documented in patients with bulimia nervosa and is believed to result from repeated vomiting and autonomic stimulation. Periodontal disease observed in the study group may be attributed to poor oral hygiene, altered immune response, and nutritional deficiencies, further emphasizing the multifactorial nature of oral health deterioration in eating disorders. The delayed presentation and underdiagnosis of eating disorders among women due to social stigma and lack of awareness underscore the importance of early detection. Dental professionals are often the first healthcare providers to encounter signs suggestive of eating

disorders during routine examinations.<sup>[14]</sup> The use of screening tools such as the SCOFF questionnaire in dental settings may facilitate early identification, timely referral, and interdisciplinary management involving medical and mental health professionals. ogies requiring treatment were significantly higher compared with healthy individuals.

### CONCLUSION OF DISCUSSION

The present study demonstrates a significant association between eating disorders and compromised oral health status in women. Dental hard tissue damage, mucosal lesions, xerostomia, and periodontal disease were more prevalent among individuals with eating disorders. These findings reinforce the pivotal role of dental professionals in the early detection and management of eating disorders through recognition of oral manifestations and appropriate referral, ultimately contributing to comprehensive and holistic patient care.

### Limitations and Future Directions

Despite its strengths, the present study has certain limitations. The cross-sectional design precludes establishing a causal relationship between eating disorders and oral manifestations. Additionally, reliance on self-reported data and screening tools may introduce reporting bias. The study was conducted in a single institution, which may limit the generalizability of the findings to the broader population.

Future longitudinal studies with larger, multi-center samples are recommended to better elucidate the temporal relationship between eating disorders and oral health changes. Further research focusing on intervention strategies and the role of preventive dental care in this population is also warranted.

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