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Review Article

Celiac Disease and Oral Health-Related Quality of Life: The Role of Oral Manifestations and Gluten Free-Diet Adherence

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Abstract

Celiac disease (CD) is a systemic immune-mediated disorder that is characterized by an immunological response to gluten. CD is associated with various oral manifestations including dental enamel defects (DEDs), recurrent aphthous stomatitis (RAS), delayed tooth eruption, xerostomia, and atrophic glossitis. While the oral manifestations of CD have been recognized, evidence regarding their impact on oral health–related quality of life (OHRQoL) remains underexplored. This narrative review summarizes and critically discusses the available evidence regarding OHRQoL in patients with celiac disease and investigates the role of oral manifestations and gluten-free diet (GFD) in shaping these outcomes.

Findings suggest that children with CD may exhibit poorer OHRQoL than healthy children. The negative impact of RAS on OHRQoL was the most consistently reported finding in the literature, while evidence regarding the DEDs remains inconsistent. Xerostomia was also associated with poorer OHRQoL in adults. GFD adherence may improve some oral manifestations including RAS, atrophic glossitis and glossodynia. However, Other irreversible manifestations such as DEDs may persist despite dietary adherence.

Future well-designed, large-scale studies using standardized OHRQoL instrument and validated GFD adherence measures are required to understand the association between celiac disease and OHRQoL.

Keywords: Oral Health-Related Quality of Life; Celiac Disease; Oral Manifestations; Gluten-Free Diet; Dental Enamel Defect; Recurrent Aphthous Stomatitis

Abbreviations

CD: Celiac Disease; GFD: Gluten-Free Diet; OHRQoL: Oral Health–Related Quality of Life; HRQoL: Health-Related Quality of Life; QoL: Quality of Life; DEDs: Dental Enamel Defects; RAS: Recurrent Aphthous Stomatitis; OHIP-14: Oral Health Impact Profile-14; CPQ: Child Perceptions Questionnaire; P-CPQ: Parental-Caregiver Perceptions Questionnaire; ECOHIS: Early Childhood Oral Health Impact Scale; CHILD-OIDP: Child Oral Impacts on Daily

Performances; DMFT: Decayed, Missing, and Filled Permanent Teeth; MeSH: Medical Subject Headings; SANRA: Scale for the Assessment of Narrative Review Articles; HLA: Human Leukocyte Antigen; DQ2/DQ8: HLA-DQ2/HLA-DQ8 Haplotypes.

Introduction

In genetically predisposed individuals, gluten (gliadin and other prolamin) causes a systemic immunological disorder known as celiac disease (CD) [1]. Clinically, CD often presents with gastrointestinal symptoms such as diarrhea, steatorrhea, abdominal pain, bloating, and weight loss [2]. Furthermore, CD can also manifest a wide range of extraintestinal symptoms, including anemia, osteoporosis, dermatitis herpetiformis, neurological disorders, liver abnormalities, infertility, and fatigue [3]. In addition, CD associated with several oral manifestations such as xerostomia, dental enamel defects (DEDs), recurrent aphthous stomatitis (RAS), and delayed dental eruption [4,5].

The burden of CD extends beyond clinical symptoms, the economic effect of CD includes adherence to long-term gluten-free diet (GFD), as gluten-free products are significantly more expensive and less readily available than wheat-based substitutes [6]. Lifelong dietary restrictions and gluten-free alternatives to staple foods like bread, pasta, and wheat flour may be less appealing, and are typically regarded as a considerable treatment burden [7], potentially leading to psychological distress, especially during sensitive phases such as adolescents [8].

Moreover, clinical manifestations significantly impact patient's overall quality of life (QoL) including health-related quality of life (HRQoL) and oral health–related quality of life (OHRQoL) [9–11]. However, some intestinal and systemic symptoms can be significantly improved with early detection and a strict adherence to a GFD [12,13], which may significantly improve quality of life [14].

While the oral manifestations in CD have been well studied and recognized, evidence regarding their impact on oral health–related quality of life (OHRQoL) remains unexplored. Therefore, this review summarizes the available evidence regarding OHRQoL in patients with celiac disease and investigates the role of oral manifestations and GFD in shaping these outcomes, and to compare OHRQoL between individuals with celiac disease and healthy controls.

Materials and Methods

All This narrative review was conducted in accordance with the SANRA recommendations for narrative reviews [15]. The purpose of this review was to summarizes and critically discusses the available evidence regarding OHRQoL in patients with CD and investigate the role of oral manifestations and gluten-free diet in shaping these outcomes.

The literature search was conducted up to May 2026. Electronic databases including PubMed, Web of Science and CINAHL were searched for all the publications, with no date or language restrictions, and all the relevant papers were identified. The search used a combination of Medical Subject Headings (MeSH) terms and keywords such as "Celiac disease" [MeSH], "Coeliac disease" [MeSH], "Oral Health" [MeSH], "Quality of life" [MeSH], "Gluten-free diet" [MeSH], "Oral manifestation" [MeSH]. Relevant studies references list were manually searched to identify additional articles.

Studies were considered eligible if they investigated OHRQoL in patients with CD, assessed oral manifestations associated with CD, or evaluated the influence of GFD adherence on oral manifestations or OHRQoL. Non-peer reviewed articles, and studies focusing on any other gastrointestinal disease were excluded. All included studies were subjected to critical appraisal.

Given the variation in OHRQoL instruments, oral manifestations assessed, and GFD adherence measures, a narrative synthesis approach was used. The evidence was organized into, Oral manifestations of CD and the influence of GFD adherence, Oral health-related quality of life (OHRQoL) in patients with CD and oral manifestations of CD as predictors of OHRQoL.

Results and Discussion

Oral manifestations of CD and the influence of GFD adherence

In the literature, celiac disease associated with multiple oral manifestations including hard and soft oral tissue lesions [4]. These oral findings serve as significant diagnostic indicators, especially for asymptomatic non-classical CD [16]. These oral conditions could result from genetic predispositions, immunological reactions, or nutritional deficits due to intestinal malabsorption [17].

Dental enamel defects (DEDs) are among the most often observed oral manifestations of celiac disease, characterized by

a symmetrical and chronological distribution at all four dental quadrants, mainly involving incisors and molars [18]. The overall prevalence of DEDs was 42.47% of patients with celiac disease [4]. Moreover, DEDs are irreversible in permanent teeth and therefore do not respond to GFD once established [19,20]. However, early diagnosis in childhood and strict GFD since diagnosis help prevent their development [21].

Recurrent aphthous stomatitis (RAS) occurs more frequently among celiac patients than healthy individuals [4]. However, assessing the prevalence of RAS can be challenging as it may often improve following the implementation of a gluten-free diet [22]. Nevertheless, persistent RAS can occur particularly in the presence delay diagnosis, poor dietary adherence, or shorter duration of the gluten-free diet [23].

Dental age and tooth eruption may be delayed in children with celiac disease, due to the insufficient nutritional status and frequent delays in overall growth and development in active CD [24]. The delayed diagnosis of CD and poorer nutrition disrupted dental development, as delayed eruption has been reported in 20–27% of pediatric cases and improves after the introduction of a well conducted GFD [25]. Early identification and introduction of a GFD are crucial since malnutrition can irreversibly impair tooth development [5].

Besides the above-mentioned, other oral manifestations have been suggested to be associated with celiac disease including xerostomia, atrophic glossitis and glossodynia [4]. The resolution of atrophic glossitis and glossodynia symptoms has been reported following adherence to a GFD [26,27].

Oral health-related quality of life (OHRQoL) in patients with CD

Oral health-related quality of life (OHRQoL) is a component of overall HRQoL and can be defined as "a subjective assessment of the individual's sense of self, expectations, and satisfaction with care, emotional well-being, functional well-being, and oral health" [28].

Oral manifestations associated with celiac disease may negatively impact OHRQoL [11]. However, the available evidence remains limited and inconsistent.

Van Gils., *et al*. were the first to suggest an association between OHRQoL and CD [29], demonstrating that individuals with CD had significantly poorer OHRQoL compared with healthy controls. Subgroup analysis further showed that oral health impact profile (OHIP-14) scores were not associated with the age of CD onset or the duration of adherence to a GFD. However, the study relied on self-reported GFD adherence and estimated duration based on time since diagnosis rather than using a validated adherence assessment tool, which may have introduced reporting bias and limited the ability to accurately determine the true relationship between GFD adherence and OHRQoL.

Similarly, children with CD demonstrate significantly lower OHRQoL when compared to healthy controls [11,30]. Significant differences between CD patients and controls were observed in the oral symptoms and emotional well-being subscales, whereas functional limitation and social well-being domains did not differ significantly between the two groups [11].

In contrast, according to Amirabadi., *et al*. children with CD demonstrated similar oral health related quality of life score to healthy control. However, the cross-sectional study design may have introduced recall bias [31]. Moreover, a cross-sectional study conducted on Portuguese children reported generally acceptable OHRQoL among affected children [32].

The conflicting findings across studies may partly relate to the potential influence of the GFD as a modifiable factor that can improve oral manifestations, which themselves are known to negatively affect OHRQoL. Nevertheless, none of these studies objectively assessed GFD adherence using validated measures, limiting interpretation of this relationship. Table 1 summarizes the available evidence and studies assessing OHRQoL in celiac patients.

Oral manifestations of CD as predictors of OHRQoL

Findings suggest that several oral conditions may influence OHRQoL in patients with celiac disease. Studies regarding dental caries demonstrated that increased decayed, missing, and filled permanent teeth (DMFT) scores correlated with poorer OHRQoL outcomes in celiac children [30,31]. However, based on a recent systematic review and meta-analysis CD is not a determinant factor in the development of dental caries in children and adolescents when compared to a control group [33].

Author/Year	Design	OHRQoL Measure	Key Findings
Van Gils., *et al*. [29] 2017	Case-Control	OHIP-14	Patients with CD had poorer OHRQoL than controls, No significant effects of gender, age at CD diagnosis, or time on a GFD on OHIP-14 scores.
A. A. El-Housseiny., *et al*. [11] 2022	Case-Control	CPQ8-10, CPQ11-14, P-CPQ	Poor OHRQoL in CD children, RAS reported more in cases and negatively affected OHRQoL, No significant association between DEDs, Caries, Malocclusion and OHRQoL.
F. Amirabadi., *et al*. [31] 2023	Case-Control	ECOHIS	No statistically significant difference in OHRQoL between groups, DMFT scores lower in cases, Positive correlation between DMFT and OHRQoL.
M. Coelho., *et al*. [32] 2023	Cross-Sectional	ECOHIS	Good overall OHRQoL scores, RAS, caries were most frequently reported oral manifestation and had negative impact on OHRQoL, Xerostomia significantly associated with OHRQoL.
F. Amirabadi., *et al*. [30] 2024	Case-Control	CHILD-OIDP	Higher OHRQoL in cases group, Higher DEDs in cases and Significant relationship between OHRQoL and DEDs in both groups, No significant difference in DMFT scores but caries negatively affected OHRQoL.

Table 1: Summary of studies investigating OHRQoL in patients with celiac disease.

Recurrent aphthous stomatitis celiac disease patients may contribute to impaired OHRQoL, leading to functional discomfort and increased psychosocial burden [11,32].

Evidence regarding the association between dental enamel defects (DEDs) and OHRQoL in patients with CD remains inconsistent. El-Housseiny., *et al*. reported that DEDs and OHRQoL did not significantly correlate in either the CD or control groups [11]. In contrast, another study observed a significant relationship between DEDs and poorer OHRQoL in both the CD and controls [30].

Adults with CD reported higher xerostomia scores and poorer OHRQoL than controls, However, the direct association between xerostomia and OHRQoL was not specifically examined [29]. While malocclusion in celiac patients was not found to have a significant effect on OHRQoL [11].

Conclusion

Oral manifestations associated with CD may impact OHRQoL, particularly through discomfort and psychosocial impact. Despite the methodological and outcome variations across the studies, a general trend showed that children with CD may exhibit lower OHRQoL than healthy children. The negative impact of recurrent aphthous stomatitis (RAS) on OHRQoL was the most consistently reported finding in the literature. However, the influence of CD on OHRQoL in adults is underexplored.

Future studies require well-designed, large-scale, and longitudinal studies to further understand the association between celiac disease and OHRQoL. Standardized OHRQoL instrument and validated GFD adherence measures are recommended.

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Conflict of Interest

No conflict of interest.

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