

Tooth Wear's Effect on Quality of Life

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ABSTRACT

Tooth wear is a complex, multifactorial condition involving the progressive loss of dental hard tissues through mechanical, chemical, and biomechanical processes, including attrition, abrasion, erosion, and abfraction. This condition significantly compromises oral health, masticatory function, aesthetics, and psychosocial well-being. This narrative review synthesizes current evidence on the impact of tooth wear on oral health-related quality of life (OHRQoL). Studies using validated assessment tools such as the Oral Health Impact Profile (OHIP) and Basic Erosive Wear Examination (BEWE) consistently show that individuals with moderate to severe tooth wear frequently experience pain, functional limitations, and psychological discomfort. Although clinical outcomes vary, restorative interventions—particularly composite resin rehabilitation—are generally associated with improved patient-centered outcomes. Greater awareness and integration of tooth wear into public oral health strategies are essential for long-term quality of life improvements. This review underscores the importance of early diagnosis, comprehensive evaluation of etiological factors, and a multidisciplinary management approach to effectively address the challenges posed by tooth wear.

Keywords: *Tooth wear, oral health-related quality of life, public health, Oral Health Impact Profile; multidisciplinary management*

INTRODUCTION

Tooth wear refers to the progressive and irreversible loss of dental hard tissues due to physical or chemical factors and is increasingly recognized as a significant challenge in modern dentistry. Unlike caries or periodontal disease, tooth wear is non-microbial in origin and stems from a range of mechanical and chemical processes. It affects people across all age groups and is no longer limited to older populations—rising prevalence is seen in younger and middle-aged adults due to changes in lifestyle, diet, and stress levels (Kelleher & Bishop, 2019).

This condition is multifactorial and influenced by various behavioral and environmental risk factors, including bruxism, acidic diets, poor oral hygiene practices, and parafunctional habits.

These factors interact in complex ways to produce wear patterns that compromise oral function, aesthetics, and comfort. As a result, tooth wear has a measurable negative impact on oral health-related quality of life (OHRQoL), often leading to pain, sensitivity, chewing difficulties, and psychological discomfort (Papagianni et al., 2013).

Validated assessment tools such as the Oral Health Impact Profile (OHIP) and the Basic Erosive Wear Examination (BEWE) have demonstrated the significant burden tooth wear imposes on affected individuals. Recognizing and managing tooth wear early is crucial. Understanding the distinct etiologies of tooth wear is essential for developing effective, patient-centered strategies. Management often requires a multidisciplinary approach involving behavioral modification, dietary counseling, occlusal adjustment, minimally invasive restorative techniques (e.g., composite rehabilitation), and, in advanced cases, full prosthodontic reconstruction. Early diagnosis and personalized prevention are key to minimizing long-term damage and preserving quality of life (Wetselaar et al., 2018).

CATEGORIES OF TOOTH WEAR

To effectively manage tooth wear, it is essential to understand its distinct etiological categories. Although these processes may overlap clinically, they are classified based on the underlying mechanism:

- **Attrition**
Attrition refers to tooth structure loss caused by direct tooth-to-tooth contact, typically due to normal mastication or parafunctional habits such as bruxism. It is commonly seen on occlusal and incisal surfaces, resulting in flattened, shiny wear facets and, in advanced cases, loss of vertical dimension (Kelleher & Bishop, 2019).
- **Abrasion**
Abrasion results from mechanical wear due to external agents. Common causes include aggressive toothbrushing with abrasive toothpaste, use of hard-bristled brushes, or habits like nail biting and using teeth as tools. Lesions are often located at the cervical regions and may appear as smooth, shallow notches or grooves (Kelleher & Bishop, 2019).
- **Erosion**
Erosion involves the chemical dissolution of tooth structure by acids that are not of bacterial origin. Sources include acidic foods and beverages, gastroesophageal reflux disease (GERD), and eating disorders such as bulimia. Erosive lesions often appear as broad, shallow concavities with a glazed, smooth surface and can affect both enamel and dentin (Bartlett, Shah, & Smith, 2013).
- **Abfraction**
Abfraction is the loss of tooth substance at the cervical margins due to biomechanical loading forces. Occlusal stress leads to tooth flexure, creating microfractures that result

in wedge-shaped or V-shaped lesions. While often difficult to isolate clinically, abfraction is considered a contributing factor, especially in cases where other types of wear are present (Kelleher & Bishop, 2019).

Understanding these categories enables clinicians to identify causative factors more precisely and guide appropriate intervention. Because multiple wear mechanisms often coexist, treatment should be customized to address the dominant etiological factors while preserving as much healthy tooth structure as possible.

EPIDEMIOLOGY AND GLOBAL BURDEN

Tooth wear is a global health concern, with reported prevalence ranging from 20–45% worldwide for irreversible enamel wear—rising to over 80% in some adult populations (e.g., 83.5% in Saudi Arabia) and around 23% among young children. Several population-based studies have quantified its impact on quality of life. To highlight the global perspective, Table 1 summarizes studies from different countries, comparing sample sizes, methods, and key conclusions—including the lack of Georgian data.

Table 1. Country-Specific Studies on Tooth Wear and QoL

Country	Author(s)	Year	Sample Size	Main Findings
Netherlands	Papagianni et al.	2013	198	Lower OHRQoL in tooth wear group using OHIP-NL
Germany	Hassel et al.	2012	25	Emotional distress linked to anterior erosion
Brazil	Paryag et al.	2019	~300	High soft drink consumption linked to erosive wear
United Kingdom	van't Spijker et al.	2009	3,000+	60% prevalence in adults; QoL impact confirmed
Trinidad & Tobago	Paryag et al.	2019	150	Risk factors included acidic diet and poor brushing habits
Netherlands	Vermaire et al.	2017	42	QoL improved significantly after composite restoration
Georgia	[No major study]	—	—	Lack of data; study needed to assess prevalence and QoL impact

Note: OHIP-NL = Dutch version of the Oral Health Impact Profile.

These findings highlight the global relevance of tooth wear, yet notable data gaps remain in several regions, including Georgia.

WHY A GEORGIAN STUDY IS NEEDED?

Despite robust international data, there is a lack of structured research on tooth wear in Georgia. Local dietary habits (e.g., acidic fruit and beverage intake), healthcare disparities, and public awareness levels differ from other regions.

Rationale for conducting a Georgian study includes:

- Lack of local data: No national or regional tooth wear studies currently exist
- Public health relevance: Understanding local prevalence helps target high-risk groups
- Policy and education impact: Findings can guide national oral health strategies and educational reforms
- Access to care: Data can help allocate resources for restorative and preventive programs

Tooth wear must be viewed not only as a clinical challenge but also a public health concern in Georgia and similar countries.

MEASURING TOOTH WEAR AND QUALITY OF LIFE

Clinical tools such as the Basic Erosive Wear Examination (BEWE) and Tooth Wear Index (TWI) are used to assess the severity and extent of wear. These help standardize diagnosis and guide treatment decisions.

For quality of life assessment, validated instruments such as the Oral Health Impact Profile (OHIP-14, OHIP-NL), Oral Impacts on Daily Performance (OIDP), and Dental Impact on Daily Living (DIDL) are commonly used. These scales measure pain, eating difficulty, aesthetics, and psychological well-being.

Papagianni et al. (2013) reported significantly lower OHRQoL scores in individuals with tooth wear compared to controls, particularly regarding appearance and chewing ability. Hassel et al. (2012) highlighted the emotional distress and self-consciousness experienced by patients with advanced anterior erosion. Vermaire et al. (2017) found that composite restorations led to long-term improvements in comfort and function.

EVIDENCE ON TOOTH WEAR AND QoL

Consistent evidence shows that increased tooth wear severity correlates with diminished quality of life. Some patients experience hypersensitivity, social embarrassment, or eating limitations, especially when anterior teeth are affected.

A study by van't Spijker et al. (2009) revealed that more than 60% of middle-aged adults had moderate-to-severe wear, which often interfered with daily functioning and self-image. Kelleher and Bishop (2019) emphasized the psychological toll of visible tooth damage. However, one 2022 cross-sectional study noted that not all patients with severe wear reported poor quality of life, underscoring the influence of co-occurring symptoms and coping mechanisms.

TREATMENT AND MANAGEMENT

Management of tooth wear depends on the severity of tissue loss, associated symptoms, functional needs, and patient expectations. A tailored approach is essential, and strategies generally fall into four categories:

- **Prevention:** Includes dietary counseling to reduce acidic intake, instruction on gentle brushing techniques, use of fluoride products, and fabrication of nightguards to minimize attrition due to bruxism.
- **Minimally invasive restorations:** Composite resins or overlays are frequently used to restore worn tooth surfaces conservatively, maintaining maximum tooth structure.
- **Advanced rehabilitation:** In severe cases, full-mouth reconstruction using ceramic crowns or onlays may be required. Material selection should balance aesthetics, wear resistance, and long-term durability.
- **Technology-enhanced care:** Intraoral scanners, 3D imaging, and artificial intelligence (AI) tools now enable precise monitoring of wear progression and support personalized treatment planning.

In a clinical intervention, Wetselaar et al. (2018) found that patients receiving composite restorations experienced significant improvements in oral health-related quality of life compared to those who received only preventive counseling. Functional, aesthetic, and psychological benefits were noted, reinforcing the importance of timely restorative care.

Comprehensive management also involves patient education on acid exposure and oral habits, behavior modification, and regular monitoring using standardized indices such as the BEWE. For complex or multifactorial cases, an interdisciplinary approach involving prosthodontists, dietitians, psychologists, and gastroenterologists is often necessary to achieve sustainable outcomes.

Several notable studies have investigated the connection between tooth wear and oral health-related quality of life (OHRQoL). Table 2 provides a summary of key research findings.

Table 2. Summary of Key Studies on Tooth Wear and QoL

Author(s)	Year	Study Design	Sample Size	QoL Tool Used	Key Findings
Papagianni et al.	2013	Case-Control	198	OHIP-NL	Significant QoL impairment in tooth wear group
Wetselaar et al.	2018	Clinical Intervention	68	OHIP-14	Restorative treatment improved OHRQoL
[Unknown]	2022	Cross-sectional	570	OHIP-14	QoL affected by behavior and severity of wear
van't Spijker et al.	2009	Epidemiological	3,000+	Questionnaire	60% had wear; wear linked to social and functional issues
Kelleher & Bishop	2019	Narrative Review	N/A	N/A	Highlighted aesthetic and psychological impact
Vermaire et al.	2017	Longitudinal	42	OHIP-14	Long-term QoL benefits after composite rehabilitation
Hassel et al.	2012	Clinical Case Series	25	Self-reported	Documented emotional distress and recovery post-treatment

DISCUSSION

Although the majority of available studies point to a direct relationship between tooth wear and QoL deterioration, limitations persist. Many studies are cross-sectional, preventing causal conclusions. There is also variation in diagnostic criteria and patient populations. Despite these gaps, the consistent use of validated tools strengthens the evidence base.

The emerging role of digital technologies, such as intraoral scanning and artificial intelligence-based monitoring systems, could improve early detection and allow personalized care. Furthermore, cost-effectiveness analyses of various interventions are scarce but needed to support broader policy and insurance coverage for tooth wear treatment.

From a public health perspective, tooth wear should be addressed alongside caries and periodontal disease. Preventive strategies in schools and community clinics, coupled with national dietary guidance and labeling, could reduce the intake of erosive substances. Incorporating tooth

wear surveillance into regular dental exams can help catch early-stage wear before irreversible damage occurs.

Moreover, tooth wear must be seen as a multidisciplinary issue that extends beyond the dental chair. Its etiology is often complex and linked with systemic conditions such as gastroesophageal reflux disease (GERD), eating disorders, and stress-related bruxism, all of which may require coordinated care across medical, psychological, and nutritional specialties. For example, Bartlett et al. (2013) demonstrated that patients with GERD are more likely to experience dental erosion, while Johansson et al. (2008) emphasized the impact of eating disorders on oral structures. Addressing these cases effectively necessitates cooperation among dentists, gastroenterologists, psychologists, and dietitians.

From a systems perspective, tooth wear also reflects broader behavioral and socio-economic trends. Public health strategies—such as education campaigns, school-based prevention, and integration of oral health into general checkups—can help reduce risk at the population level. The World Health Organization (2022) supports integrating oral health into primary care for sustainable health systems.

Given its multifactorial nature and social, psychological, and medical implications, a comprehensive, interdisciplinary approach is essential.

CONCLUSION

Tooth wear is more than a mechanical problem; it is a complex condition that significantly affects patients' quality of life. Early recognition and intervention are key to avoiding long-term consequences. Addressing tooth wear requires not only clinical restoration but also behavioral and systemic change. Interdisciplinary collaboration and integration into public health strategies are essential to address tooth wear effectively at both the individual and population levels.

REFERENCES

- Bartlett, D., Shah, P., & Smith, B. (2013). The role of erosion in tooth wear in gastroesophageal reflux patients. *Journal of Dentistry*, 41(3), 195–200.
<https://doi.org/10.1016/j.jdent.2012.12.007>
- Hassel, A. J., Schmitter, M., Balke, Z., & Rammelsberg, P. (2012). Clinical symptoms in patients with advanced erosive tooth wear. *Clinical Oral Investigations*, 16(2), 473–479.
<https://doi.org/10.1007/s00784-011-0570-2>
- Johansson, A. K., Norring, C., Unell, L., & Johansson, A. (2008). Eating disorders and oral health: A matched case-control study. *European Journal of Oral Sciences*, 116(2), 140–145.
<https://doi.org/10.1111/j.1600-0722.2007.00487.x>
- Kelleher, M., & Bishop, K. (2019). Tooth surface loss: An overview. *British Dental Journal*, 226(6), 362–371. <https://doi.org/10.1038/s41415-019-0160-x>
- Papagianni, C. E., van der Meulen, M. J., Naeije, M., & Lobbezoo, F. (2013). Oral health-related quality of life in patients with tooth wear. *Journal of Dentistry*, 41(11), 928–933.
<https://doi.org/10.1016/j.jdent.2013.08.006>
- Paryag, A., Rafeek, R., & Rahaman, S. (2019). Erosive tooth wear: Prevalence and risk factors in a young adult population. *Journal of Clinical and Experimental Dentistry*, 11(4), e353–e359.
<https://doi.org/10.4317/jced.55238>
- van't Spijker, A., Rodriguez, J. M., Kreulen, C. M., Bronkhorst, E. M., Bartlett, D. W., & Creugers, N. H. (2009). Prevalence of tooth wear in adults. *International Journal of Prosthodontics*, 22(1), 35–42. <https://pubmed.ncbi.nlm.nih.gov/19279040/>
- Vermaire, J. H., Wetselaar, P., & Lobbezoo, F. (2017). QoL and economic evaluation of composite treatment for tooth wear. *European Journal of Oral Sciences*, 125(3), 240–246.
<https://doi.org/10.1111/eos.12338>
- Wetselaar, P., Vermaire, J. H., Visscher, C. M., Lobbezoo, F., & Schols, J. M. (2018). The influence of management of tooth wear on oral health-related quality of life. *Clinical Oral Investigations*, 22(2), 793–799. <https://doi.org/10.1007/s00784-017-2198-z>
- World Health Organization. (2022). *Oral health: Global strategy on oral health*. WHO.
<https://www.who.int/publications/i/item/9789240050973>