ORIGINAL ARTICLE

Evaluating Knowledge, Attitudes and Practices regarding Dental Erosion among Tunisian Dental Practitioners

Evaluation des Connaissances, Attitudes et Pratiques concernant l'érosion dentaire chez des médecins dentistes tunisiens

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Abstract

Introduction: Dental erosion is characterized by the irreversible loss of tooth structure due to non-bacterial acids. Despite its prevalence, the level of awareness and understanding among dental practitioners remains unclear, particularly in Tunisia.

Aim: This study aimed to assess the Knowledge, Attitudes, and Practices of dental practitioners in Tunisia regarding the causes, risk factors, symptoms, and management of dental erosion.

Methods: A cross-sectional, descriptive, observational and analytical study conducted over 12 months (January 2024 to January 2025) among dental practitioners in Sousse, Tunisia, working in both public and private sectors. The target population included licensed private dentists, hospital-university practitioners, dental residents, and thesis-level dental students, selected through convenience sampling across dental offices and university hospitals. Data were collected using a structured, self-administered 21-question online questionnaire developed from literature and expert input, and validated through a pilot study. The survey assessed demographic data, theoretical knowledge, attitudes through clinical case scenarios, and professional practices regarding dental erosion. Statistical analysis was conducted using SPSS version 19, employing descriptive statistics, t-tests, Chi-square tests, ANOVA, Fisher's exact test, and Pearson correlation, with significance set at $p < 0.05$.

Results: The study revealed a significant lack of knowledge among dental practitioners regarding the etiology, symptoms, and prevalence of dental erosion, as indicated by statistically significant p values. Furthermore, the majority of practitioners demonstrated an inadequate attitude towards dental erosion management, with 64.40% showing insufficient understanding or approach in clinical scenarios. Additionally, most practitioners neither implemented preventive measures nor utilized appropriate tests to assess the severity of dental erosion lesions.

Conclusion: The findings underscore the necessity of a multidisciplinary approach in managing dental erosion. This comprehensive approach is crucial for the early detection, assessment of underlying causes, and effective treatment of dental erosion.

Keywords: Attitudes, Dentists, Health Knowledge, Practice, Tooth Erosion.

Résumé

Introduction: L'érosion dentaire est caractérisée par une perte irréversible de la structure dentaire due à des acides non bactériens. Malgré sa prévalence, le niveau de sensibilisation et de compréhension parmi les médecins dentistes reste incertain, en particulier en Tunisie.

Objectif: Cette étude vise à évaluer les connaissances, attitudes et pratiques des chirurgiens-dentistes en Tunisie concernant les causes, facteurs de risque, symptômes et la prise en charge de l'érosion dentaire.

Méthodes: Une étude transversale a été menée sur une période de 12 mois, de janvier 2024 à janvier 2025, auprès de chirurgiens-dentistes en Tunisie. Les données ont été collectées à l'aide d'un questionnaire structuré portant sur les connaissances des praticiens à propos de l'érosion dentaire, leurs attitudes vis-à-vis de sa prévention et de son traitement, ainsi que leurs pratiques professionnelles. Les données ont été analysées à l'aide du logiciel Statistical Package for Social Sciences (SPSS version 19, IBM Corporation, New York, USA), en utilisant des statistiques descriptives, le test t de Student et le test du Chi2, avec un seuil de signification fixé à $p < 0,05$.

Résultats: L'étude a révélé un manque significatif de connaissances chez les chirurgiens-dentistes concernant l'étiologie, les symptômes et la prévalence de l'érosion dentaire, comme l'indiquent les valeurs p statistiquement significatives. De plus, les praticiens ont démontré une attitude inadéquate envers la gestion de l'érosion dentaire, 64,40 % d'entre eux montrant une compréhension ou une approche insuffisante dans les situations cliniques. En outre, la plupart des praticiens n'ont ni mis en œuvre de mesures préventives ni utilisé de tests appropriés pour évaluer la gravité des lésions d'érosion dentaire.

Conclusion: Les résultats soulignent la nécessité d'une approche multidisciplinaire pour la gestion de l'érosion dentaire. Cette approche globale est cruciale pour la détection précoce, l'évaluation des causes sous-jacentes et le traitement efficace de l'érosion dentaire.

Mots-clés : Attitudes, Chirurgiens-dentistes, Connaissances en santé, Érosion dentaire, Pratiques.

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Introduction

Non-carious tooth surface loss (NCTS) refers to a group of irreversible dental tissue lesions that aren't caused by bacterial action, unlike dental caries. These include attrition (mechanical wear due to tooth-to-tooth contact), abrasion (wear due to external mechanical forces, such as excessive brushing), and abfraction (loss of tooth structure at the cervical area due to occlusal stresses). Among these NCTS types, dental erosion is uniquely characterized by its specific chemical origin. (1,2)

Dental erosion is defined as “the irreversible loss of dental hard tissue due to chemical processes that involve acids and not bacterial action” (1). The sources of these acids can be categorized into two main groups: intrinsic factors such as gastric acid reflux, and extrinsic factors including dietary acids and environmental influences (2,3). Its growing prevalence affects individuals of all ages. While dental erosion is recognized as a common phenomenon globally, particularly in developed countries, estimating its precise worldwide prevalence remains challenging. This difficulty arises from significant variations in diagnostic indices, sample sizes, and overall study designs across different research efforts. Despite these methodological limitations, available data suggest a mean prevalence in deciduous teeth ranging between 30% and 50%, and in permanent teeth between 20% and 45%. Notably, there appears to be an increase in prevalence with age, and some studies indicate a gender difference. However, comprehensive prevalence data are still lacking from large parts of Asia, Africa, South America, North America, and South-Eastern Europe. (4) Therefore, dental erosion can lead to enamel wear, pain, sensitivity, and permanent damage. This rise affects both individual quality of life and healthcare systems, demanding early detection and comprehensive management (4). The management of dental erosion is complex and depends on the extent of the lesions. It includes not only preventing progression by identifying and controlling etiological factors but also various therapeutic approaches. These can range from behavioral and dietary counseling, fluoride application for enamel remineralization, and the use of specific toothpastes to reduce sensitivity, to conservative (composites, inlays/onlays) or prosthetic (crowns, veneers) restorations in cases of severe tissue loss. The primary goal is to preserve remaining tooth structure, restore function and aesthetics, and improve the patient's quality of life . Dental professionals play a key role in not only identifying erosion early but also implementing preventive strategies (5).

Despite the clinical significance of dental erosion, there appears to be a gap in the knowledge and awareness among dental professionals, particularly regarding its causes, risk factors, early symptoms, and appropriate management strategies (6,7). While several international studies have explored this topic, revealing similar gaps in various countries. In Tunisia, the level of knowledge and the approaches adopted by practitioners in managing dental erosion are not well documented. To date, no published study has specifically evaluated the Knowledge, Attitudes, and Practices of Tunisian dental practitioners concerning dental erosion.

This study aimed to evaluate the Knowledge, Attitudes, and Practices of Tunisian dental practitioners concerning dental erosion. By identifying gaps in their understanding and management approaches, the study seeks to highlight the need for further education and training, ultimately contributing to better patient care and outcomes in the management of dental erosion.

Methods

Study design

This study was designed as an observational, descriptive, and cross-sectional study. It was conducted between January 2024 and January 2025.

Population

The study population consisted of dental practitioners working in multiple centers in Sousse: private dental offices; the dental medicine Departments of Farhat Hached and Sahloul University Hospitals; and the intermediate healthcare center in Sousse. Practitioners were eligible if they had a valid license to practice dentistry and were actively practicing during the study period. This included only fully graduated dentists, including postgraduate residents enrolled in clinical specialization programs.

The following non-inclusion criteria were applied: healthcare professionals other than dentists; non graduated dental students; and dentists who refused to participate in the study.

Sample size

The sample size was determined using the following formula:

$n = Z_{\alpha 2}^{2} \times p (1 - p) / E^{2}$ where n is the sample size; $Z_{\alpha 2}$ is the critical value at a 95% confidence level (1.96); p is the estimated population proportion (assumed to be 0.5 for maximum variability); and E is the desired margin of error.

To account for potential non-response and ensure a sufficient number of completed surveys, the desired margin of error (E) was set at 0.0934 (9.34%), assuming a population proportion (p) of 0.5 and a 95% confidence level. This calculation yielded a required sample size of approximately 110.

Considering an anticipated non-response rate of approximately 15%, a convenience sample of 130 practitioners was then included, targeting practitioners in both public and private sectors.

Data Collection

Data were collected using a structured, self-administered 21 questions hosted on the Google Forms platform. The survey was distributed online through professional dental groups on social media (such as private Facebook groups and messaging platforms) and direct contact at healthcare

institutions. Responses were collected anonymously over the period of 12 months. It is designed for quick completion, requiring approximately five minutes.

The questionnaire was divided into four main sections. The first section (seven questions) focused on demographic data such as sex, age, workplace, and professional experience to allow differentiated analysis based on specialization and years of practice. The second one evaluated the participants' knowledge of dental erosion including four questions with multiple choice options where responses were classified into four categories: correct, incorrect, incomplete, and no answer. It assessed definition, etiology, clinical signs and prevalence of dental erosion. The third section aimed to determine the appropriateness of the therapeutic choices by featuring three clinical scenarios. Each scenario presented a case of dental wear linked to specific dietary or systemic habits, and participants were asked to choose an appropriate management strategy from several options with one option being more appropriate than others based on current conservative and restorative dentistry guidelines. The last section consisted of seven questions. Five of them were with multiple choice options designed to assess the therapeutic approaches and decision-making processes of dental practitioners regarding dental erosion. One "Yes" or "No" question focused on diagnosis tools, asking practitioners whether they used a specific tool to assess the severity of erosive lesions and one final open-ended question gathered qualitative insights and expert opinions from practitioners on potential improvements in knowledge and management strategies for dental erosion.

Before the full-scale study, a pilot study was conducted with a group of university dental teachers from the Faculty of Dental Medicine of Monastir (n=5), including associate professors and assistant professors specialized in conservative dentistry and prosthodontics. Their role was limited to evaluate the clarity, coherence, and relevance of the questionnaire. Based on their feedback, minor adjustments were made to improve the wording and structure of certain questions. These participants were not included in the main study sample.

The entire study process, from sample size determination to data analysis, is illustrated in the flow chart presented in Figure 1.

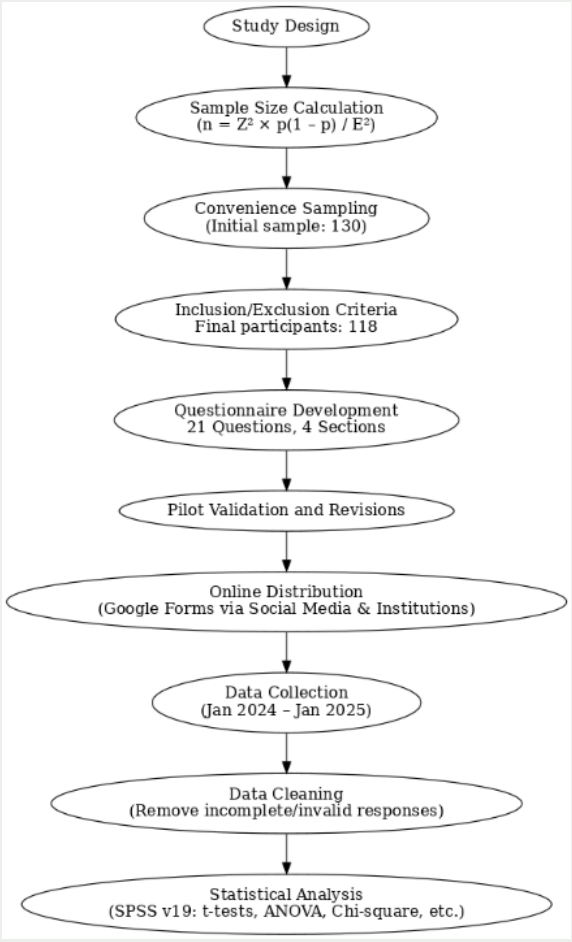

Figure 1. Flow Chart of the Questionnaire-Based KAP Study Process

Statistical analysis

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS version 19, IBM Corporation, New York, USA). Percentages and frequencies were calculated to evaluate the levels of Knowledge, Attitudes, and Pactices among the participants. Student's t-test was used to compare mean values between groups, while the chi-square test was used to compare proportions. Analysis of Variance (ANOVA) and Fisher's test, to explore differences and associations between variables. Pearson's correlation coefficient (r) was calculated to assess the strength and direction of relationships between variables.

Ethical considerations

The study adhered to ethical guidelines to protect participant confidentiality. The questionnaire was anonymous, and participants were informed about the purpose of the study and their rights as participants. Informed consent was obtained electronically, with a specific question included in the questionnaire to ask participants for their consent to receive a summary of the study findings via email. This consent information was stored separately and was not linked to the survey responses, ensuring full anonymity during data analysis.

Results

The study initially included 130 respondents, of whom 118 (90.8%) completed all 21 items of the questionnaire and were included in the final analysis.

Demographic characteristics of the sample. The characteristics of the participants are presented in Table 1. The participants were female (69.5%) with a low experience (78.0%) and practicing in public health establishment (64.4%).

Table 1. Distribution of participants according to sex, age, practice modality, and practice setting, experience and faculty of graduation (n = 118)

Demographic variable	Categories	N	Percentage
Sex	Female	82	69.5%
	Male	36	30.5%
Type of practice	Dental medicine resident	37	31.35%
	Licensed private practice dentist	43	36.4%
	Public health practicing dentist	38	32.2%
Place of practice	In a private dental office	42	35.6%
	In a public health establishment	76	64.4%
Experience	0 to 5 years	92	78.0%
	>5 years	26	22.0%
Training	Other	31	26.3%
	The Faculty of Dental Medicine of Monastir	87	73.7%

Dentists' Knowledge of dental erosion

In this study, participants demonstrated a limited understanding of dental erosion. All results are presented in the following table (Table2).

Attitudes Towards Dental Erosion Management

This study examined dental practitioners' attitudes toward managing dental erosion across three distinct clinical scenarios (Appendix1). The results of this study revealed that 64.40% of dental practitioners demonstrated inadequate management strategies for dental erosion. For early-stage dental erosion, there is a tendency toward either under-treatment or over-treatment, with practitioners failing to adopt recommended strategies such as patient education and targeted interventions.

Table 2. Distribution of participants responses regarding their knowledge of dental erosion

		Question 1: Definition			Question 2: Etiologies					Question 3: Clinical signs					Question 4: Prevalence			
Section		Correct	Incorrect	p	Correct	Incom-plete	Incorrect	No answer	p	Correct	Incom-plete	Incorrect	No answer	p	Correct	Incorrect	No answer	p
Experience	0-5 years	19 (20.7%)	73 (79.3%)	0.5	2 (2.2%)	65 (70.7%)	24 (26.1%)	1 (1.1%)	0.18	1 (1.1%)	59 (64.1%)	31 (33.7%)	1 (1.1%)	0.007 *	46 (50.0%)	44 (47.8%)	2 (2.2%)	0.634
	>5 years	7 (26.9%)	19 (73.1%)		0 (0.0%)	17 (65.4%)	7 (26.9%)	2 (7.7%)		0 (0.0%)	21 (80.8%)	3 (11.5%)	2 (7.7%)		16 (61.5%)	8 (30.8%)	2 (7.7%)	
Type of exercise	Resident	5 (35.7%)	9 (64.3%)		0 (0.0%)	12 (85.7%)	0 (0.0%)	2 (14.3%)		0 (0.0%)	12 (85.7%)	0 (0.0%)	2 (14.3%)		7 (50.0%)	5 (35.7%)	2 (14.3%)	
	Licensed private practice dentist	9 (20.9%)	34 (79.1%)	0.2	1 (2.3%)	30 (69.8%)	12 (27.9%)	0 (0.0%)	0.49	1 (2.3%)	31 (72.1%)	11 (25.6%)	0 (0.0%)	0.081	28 (65.1%)	15 (34.9%)	0 (0.0%)	0.259
	Public health	2 (13.3%)	13 (86.7%)		0 (0.0%)	8 (53.3%)	7 (46.7%)	0 (0.0%)		0 (0.0%)	10 (66.7%)	5 (33.3%)	0 (0.0%)		6 (40.0%)	9 (60.0%)	0 (0.0%)	
Training	FMDM	20 (23.0%)	67 (77.0%)	0.6	1 (1.1%)	67 (77.0%)	17 (19.5%)	2 (2.3%)	0.025 *	1 (1.1%)	65 (74.7%)	19 (21.8%)	2 (2.3%)	0.032 *	49 (56.3%)	36 (41.4%)	2 (2.3%)	0.118
	Other	6 (19.4%)	25 (80.6%)		1 (3.2%)	15 (48.4%)	14 (45.2%)	1 (3.2%)		0 (0.0%)	15 (48.4%)	15 (48.4%)	1 (3.2%)		13 (41.9%)	16 (51.6%)	2 (6.5%)	

In cases of moderate dental erosion, inappropriate treatment choices were common, with only 40% of participants selecting the optimal approach of combining patient education with minimally invasive restorative treatments. Similarly, for advanced dental erosion, a pattern of overly simplistic or excessively invasive treatment choices was observed, rather than the recommended comprehensive, minimally invasive approach. These findings highlight the urgent need for improved professional education and the establishment of clear, evidence-based guidelines to ensure dental practitioners are better equipped to manage dental erosion at all stages.

Dentists' practices regarding the management of dental erosion

After asking the following question: "Do you implement preventive measures to counter dental erosion when you identify a patient at risk during a consultation?"
The results revealed that 90.3% of dentists do not implement preventive measures for patients at risk of dental erosion. Among these, 30.3% lack the habit, and 60% are unaware of such measures. Only 9.7% of dentists reported using preventive practices in these cases (Figure 2).

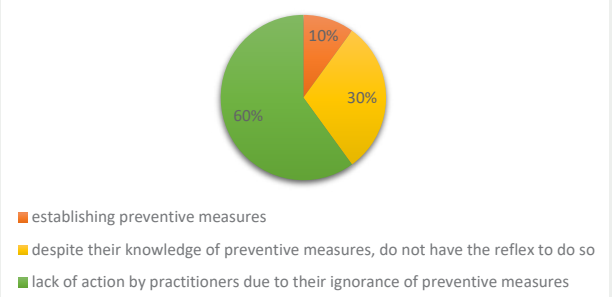

Figure 2. Illustration of participants' responses to preventive measures

This survey found that 89.5% of dentists have never used tests like the BEWE (Basic Erosive Wear Examination) to assess the severity of dental erosion, mainly due to a lack of knowledge. Only 4% considered these tests unnecessary, while just 6.5% of dentists reported using them.

Before starting any treatment for patients with dental erosion, it is essential to establish a multidisciplinary treatment plan. This approach often involves collaboration with several specialized professionals, such as gastroenterologists, nutritionists, etc.

In this study, dentists were asked about their practice of involving other professionals in the care of these patients. We found that nearly half of the participants have never collaborated with other professionals. About 30% of dentists have referred patients to a gastroenterologist at least once, 9% to a nutritionist, 7% to a specialist dentist (in prosthetics, conservative dentistry), and 9% to another medical specialist.

New Approaches in the Treatment of Dental Erosions

In the framework of conservative and minimally invasive dentistry, a specific question was included to evaluate practitioners' application of the Three Step Technique in relation to these modern treatment concepts. The results revealed that 84% of respondents had never employed this technique, while only 16% reported having used it at least once. Notably, among those claiming to use the technique, 54% demonstrated an incorrect understanding of its proper application: 21% performed direct treatments without a laboratory phase, 16% combined anterior veneers with posterior crowns, and 7% used crowns anteriorly with overlays posteriorly. In contrast, only 56% accurately followed the protocol, which consists of lingual veneers in composite resin on anterior teeth, vestibular ceramic veneers, and overlays on posterior teeth.

Self-Evaluation of Respondents' Training

In the final section, participants had the opportunity to evaluate their basic training on dental erosion. The results showed that 28% of participants reported having no information on this subject. Conversely, 69% of dentists indicated feeling insufficiently informed about dental erosion. Noteworthy that only 3% of respondents claimed to have sufficient knowledge in this area.

To improve training on dental erosion, 30% of respondents suggested more accessible workshops, 49% preferred conferences, 58% showed interest in video capsules, and 22% highlighted the need for more university courses.

Discussion

This study aims to evaluate dental practitioners' Knowledge, Attitudes, and Practices related to the causes, risk factors, symptoms, and management of dental erosion in Sousse; by identifying gaps in both initial and ongoing education, the study seeks to highlight the need for a multidisciplinary approach that enhances prevention, early detection, and effective intervention strategies.

Regarding sex, the participant group showed a predominance of female dentists (69.5%) compared to male dentists (30.5%). This sex imbalance may reflect the current trend of increasing female representation in the dental profession globally and potentially within Tunisia. The age distribution of the participants indicates that the majority (84.7%) were between 25 and 35 years old, while only 15.3% were older than 35. This suggests that the sample was largely composed of young dental practitioners, possibly reflecting the demographic profile of recent graduates or early-career professionals in the field. The distribution by type of practice shows a relatively balanced representation among participants: 36.4% were licensed private practice dentists, 32.2% were practicing in public health settings, and 31.35% were dental medicine residents. This diversity suggests a comprehensive overview of perspectives from various stages and sectors within the dental profession. The analysis of professional experience reveals that a majority of participants (78.0%) had between 0 to 5 years of experience, while only 22.0% had more than 5 years. This indicates that the sample primarily consisted of early-career dental professionals, likely reflecting the perspectives of a younger and more recently trained cohort. The data on educational background shows that the majority of participants (73.7%) received their training at the Faculty of Dental Medicine of Monastir, while 26.3% were trained elsewhere. This suggests a strong representation of graduates from the Monastir faculty within the study sample and highlights the central role this institution plays in shaping dental education and clinical practices in Tunisia.

The study reveals a significant gap in dentists' understanding of dental erosion, with only 22% of participants accurately defining the condition as the progressive loss of tooth enamel, dentin, and potentially cementum, caused by chemical dissolution rather than bacterial activity (8). This indicates a notable deficiency in knowledge, particularly regarding the impact on dental cementum and the distinction between dental erosion and tooth decay (9). Further analysis shows that dentists with over five years of experience demonstrated a marginally higher rate of correct responses, though this difference was not statistically significant. Graduated residents from the Faculty of Dentistry in Monastir had higher rates of correct answers, suggesting that academic training may positively influence understanding. However, the overall lack of detailed knowledge underscores the need for enhanced education and training. A literature review highlights an increasing prevalence of dental erosion, particularly among adults aged 35 to 55, with rates ranging from 25% to 40% (10). Our survey found that fewer than 30% of participants accurately answered questions about prevalence, demonstrating a clear gap in understanding the extent of the condition. The lack of awareness about the age groups affected by dental erosion impacts clinical management (11). The condition is increasingly prevalent among younger adults, likely

due to dietary changes (1,12). The underdiagnosis and undervaluation of dental erosion emphasize the need for improved awareness and education among dental professionals to ensure appropriate and preventive care (13). Extrinsic factors such as acidic diets, including citric acid in carbonated drinks, contribute to dental erosion by chelating calcium ions from tooth enamel and dentin (2,14,15). Erosive effects from certain medications, radiotherapy, and drug addiction further exacerbate the condition. Intrinsic factors include high gastric acidity conditions like gastroesophageal reflux (GERD) and reduced saliva production in conditions such as xerostomia. (3,7). Understanding these factors is crucial for developing effective preventive strategies and personalized treatment plans (14,15). The progression of dental erosion is marked by specific clinical signs (12). In the early stage, slight opacification and yellowish discoloration are observed, particularly on cusps and incisal edges, with minimal enamel wear (15). In the moderate stage, horizontal streaks, cup-shaped depressions, and increased cervical transparency begin to appear (16). In the advanced stage, severe enamel wear is visible, with deep streaks, areas of missing enamel exposing dentin, and changes in tooth alignment and function (17). While participants demonstrated some knowledge of these signs, their understanding was often incomplete, highlighting the need for continued education (17,18).

The attitudes of dental practitioners toward the three clinical scenarios representing different stages of dental erosion were generally unsatisfactory (18). This largely inadequate attitude highlights a significant gap in the clinical understanding and management of dental erosion (19). In early-stage erosion, where prevention and patient education are critical, 20% of practitioners failed to intervene at all, reflecting a missed opportunity for early diagnosis and conservative management. This passive approach contrasts sharply with evidence from international studies, such as Bartlett et al. (20) which emphasize the importance of early intervention in preventing the progression of erosion and preserving tooth structure. In fact, preventive measures for dental erosion include educating patients on risk factors (e.g., GERD, eating disorders, acidic diets), encouraging habit changes, using fluoride products, and ensuring regular dental check-ups (21). However, our study showed that 90.3% of practitioners do not engage in prevention while 30.3% do not include it in their practice, and 60% are unaware of the measures. Only 9.7% apply preventive strategies. This contrasts with international recommendations and current consensus statements (22), highlighting a critical need to improve preventive training in dental education. The findings suggest a generally sound understanding among practitioners that prevention is preferable to treatment. The frequent recommendation of topical fluorides and remineralizing agents aligns with current clinical expectations (23). In the moderate stage, where enamel thinning leads to discoloration, 60% of practitioners opted for aesthetically driven yet structurally inappropriate treatments such as external bleaching or full-coverage crowns. This response demonstrates a lack of awareness regarding the etiology of the discoloration and a tendency to overtreat, which is inconsistent with the principles of minimally invasive dentistry (13). Similar concerns were raised by Lussi and Carvalho (24) who warned against aggressive restorative approaches in the presence of non-carious lesions, advocating instead for enamel-preserving techniques. In the advanced stage, the finding that 70% of practitioners relied on fluoride applications or systematic endodontic treatments for generalized hypersensitivity suggests a misunderstanding of the restorative needs in severe erosion cases. According to a study by Wiegand and Attin while fluoride has a role in managing early erosion, advanced cases require restorative rehabilitation using adhesive techniques and protective occlusal schemes (25,26). To ensure appropriate clinical decisions, it is crucial not only to recognize the presence of erosion but also to accurately assess its extent and severity (24). This assessment guides the treatment plan and helps avoid under or overtreatment (27). Among the recommended tools for this purpose, the Basic Erosive Wear Examination (BEWE) index is widely advocated as a standardized method for grading erosive tooth wear (27,28). Despite its value, our study revealed that 95.82% of dentists do not use the BEWE index, primarily due to a lack of knowledge. This finding highlights a critical need for greater awareness and incorporation of such diagnostic tools into clinical training to support accurate evaluation and evidence-based management of tooth erosion.

Effective management of dental erosion requires a multidisciplinary approach, starting with etiological treatment to halt erosion before proceeding to restorative measures (30). Collaboration with specialists such as gastroenterologists and nutritionists is often necessary. Our study found that nearly half of the participants had never collaborated with other healthcare professionals, and only a minority had referred patients to specialists (15). This highlights the need for greater interdisciplinary collaboration in managing dental erosion (16,26). Advances in ceramic materials and CAD/CAM technologies have improved restorative treatments for non-carious tissue loss (31). Minimally invasive approaches, such as the Three Step Technique, have emerged as effective strategies for managing dental erosion. Developed by Francesca Vailati and her team in 2008, this protocol is designed to preserve healthy tooth structure and maintain pulpal vitality (32). It consists of three sequential phases alternating between the laboratory and clinical settings: the first focuses on anterior esthetic validation and occlusal planning, the second on adjusting vertical dimension if needed, and the third on re-establishing anterior guidance and occlusal contacts. This technique embodies the principles of conservative dentistry while achieving functional and esthetic rehabilitation (25). However, our study found that 84% of participants had never used this technique, and among those who did, 54% applied it incorrectly. This suggests a need for increased training on modern restorative methods (30). In contrast, studies by Vailati and Belser and other European reports have highlighted growing adoption of this technique

in advanced restorative practices, particularly among clinicians with specialized postgraduate training (32).

In the final section of the questionnaire, participants assessed their initial training on dental erosion, revealing a clear need to strengthen knowledge and clinical competencies in this area. Participants showed a preference for workshops and hands-on training, along with an interest in video capsules as learning tools. Incorporating advanced concepts on dental erosion into university curricula could strengthen knowledge and skills in this area (33,34). This study offers important guidance for advancing dental care in Sousse by identifying significant deficiencies in the knowledge and practices related to dental erosion. To improve the management of dental erosion, we recommend raising awareness among healthcare professionals and the public about the causes and consequences, encouraging early detection during dental visits, promoting preventive measures and the use of fluoride products, establishing treatment guidelines focused on preservation and restoration, promoting continuing education for dentists, and encouraging interprofessional collaboration.

The study's strengths include the inclusion of diverse variables enriched the analysis, enabling a deeper understanding of the various factors influencing dentists' knowledge, attitudes, and practices regarding dental erosion. This tripartite approach revealed significant trends and associations, providing valuable insights into professional behaviors and the impact of demographic factors. However, the study has limitations. Its focus on the Sousse region may not be representative of other areas due to differences in dental care access and practitioner training. The non-response rate could also bias the results, and the length of the questionnaire may have affected response quality and rate. Additionally, the use of the category "incomplete" in the knowledge assessment may introduce a degree of subjectivity. However, to reduce ambiguity, predefined scoring criteria were developed during the pilot phase and consistently applied. These criteria specified when an answer should be considered incomplete, especially in multiple-choice questions with more than one correct option.

Another limitation concerns the brevity of the theoretical knowledge section, which included only four questions. While this decision was made to maintain a short completion time and ensure practitioner participation, it may have limited the depth of assessment regarding such a complex and multifactorial topic as dental erosion. Future studies should consider expanding the number and scope of knowledge-based items to provide a more comprehensive evaluation.

Conclusion

The research identified notable deficiencies in both initial and ongoing education about dental erosion among dentists. To address these gaps, we recommend increasing access to educational opportunities, such as workshops, conferences, and online resources like video capsules. Additionally, revising dental school curricula to include more advanced content on tooth erosion.

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