Universidad Europea

GRADUATION PROJECT

Degree in Dentistry

MOUTH RINSES IN PERIODONTAL TREATMENT

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RESUMEN

Introducción: Las enfermedades periodontales se encuentran entre las afecciones inflamatorias crónicas más prevalentes en todo el mundo y representan un importante problema de salud pública debido a su impacto en la función oral, la estética y la calidad de vida. Los enjuagues bucales se utilizan comúnmente como agentes complementarios en la terapia periodontal; sin embargo, las prácticas de prescripción entre los profesionales dentales siguen siendo heterogéneas. **Objetivos**: El objetivo principal de este estudio fue evaluar las prácticas de prescripción de los cirujanos dentales con respecto al uso de enjuagues bucales en el tratamiento de la enfermedad periodontal. El objetivo secundario era analizar la percepción de los dentistas sobre la eficacia y la tolerancia de los enjuagues bucales. **Material y método**: Se realizó un estudio descriptivo transversal mediante un cuestionario digital distribuido a odontólogos. Se recopilaron un total de 98 respuestas, de las cuales 93 se incluyeron en el análisis final tras excluir a los participantes que no dieron su consentimiento informado. Los datos se analizaron de forma descriptiva y se presentaron mediante representaciones gráficas. **Resultados**: Los enjuagues bucales se recetaban ampliamente, y el 98 % de los encuestados informó de un uso regular u ocasional. La clorhexidina fue el agente recetado con mayor frecuencia (92,5 %), y la mayoría de las recetas se limitaban a 7-10 días (63 %). La gingivitis fue la principal indicación clínica (96,8 %). La mayoría de los profesionales consideraban que los enjuagues bucales eran muy eficaces (73 %) o eficaces (26 %). Aunque el 25 % informó haber observado efectos secundarios, estos se describieron en general como poco frecuentes. Las pruebas clínicas y los efectos secundarios fueron los principales factores que influyeron en las decisiones de prescripción. **Conclusiones**: Los enjuagues bucales se utilizan ampliamente como agentes complementarios en el cuidado periodontal, y los patrones de prescripción se ajustan en gran medida a las pruebas científicas actuales.

PALABRAS CLAVE

Odontología, Periodoncia, Receta de enjuague bucal, Clorhexidina, Gingivitis, Tratamiento periodontal.

ABSTRACT

Introduction: Periodontal diseases are among the most prevalent chronic inflammatory conditions worldwide and represent a significant public health concern due to their impact on oral function, aesthetics, and quality of life. Mouth rinses are commonly used as adjunctive agents in periodontal therapy; however, prescribing practices among dental professionals remain heterogeneous. **Objectives**: The primary objective of this study was to evaluate the prescribing practices of dental surgeons regarding the use of mouth rinses in the management of periodontal disease. The secondary objective was to analyze dentist's perceptions of mouth rinse effectiveness and tolerance. Material and method: A descriptive cross-sectional study was conducted using a digital questionnaire distributed to dental practitioners. A total of 98 responses were collected, and 93 were included in the final analysis after exclusion of participants who did not provide informed consent. Data were analyzed descriptively and presented using graphical representations. **Results**: Mouth rinses were widely prescribed, with 98% of respondents reporting regular or occasional use. Chlorhexidine was the most frequently prescribed agent (92.5%), and most prescriptions were limited to 7–10 days (63%). Gingivitis was the primary clinical indication (96.8%). The majority of practitioners perceived mouth rinses as very effective (73%) or effective (26%). Although 25% reported observing side effects, these were generally described as rare. Clinical evidence and side effects were the main factors influencing prescription decisions. **Conclusions**: Mouth rinses are extensively used as adjunctive agents in periodontal care, with prescribing patterns largely aligned with current scientific evidence.

KEYWORDS

Dentistry, Periodontology, Mouth rinse prescription, Chlorhexidine, Gingivitis, Periodontal treatment.

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1. INTRODUCTION

1.1. Background and context

According to the World Health Organization in 2022, advanced forms of periodontal disease affect more than one billion people worldwide, making them among the most prevalent chronic inflammatory conditions (1). This considerable global burden highlights the importance of effective preventive strategies and well-defined therapeutic approaches aimed at limiting disease progression and improving oral health outcomes (1). Over the past decades, periodontal diseases have emerged as a major public health concern due to their high prevalence, chronic nature, and significant impact on oral function, aesthetics, and quality of life (1).

1.1.1. Nature of periodontal diseases

Periodontal diseases are complex and multifactorial pathologies characterized by inflammation of the periodontium, composed of alveolar bone, gingiva, cementum and periodontal ligament (2). Their development is closely linked to the accumulation of dental plaque, a structured microbial biofilm adhering to tooth and gingival surfaces (3). This biofilm protects microorganisms from host immune defenses and reduces antimicrobial effectiveness, making plaque control a major challenge in periodontal care (2,3).

1.1.2. Biofilm formation and dysbiosis

Dental plaque formation begins with pioneer bacteria such as Streptococcus and Actinomyces species (4). As the biofilm matures, more virulent microorganisms proliferate, leading to dysbiosis characterized by Gram-negative anaerobic bacteria like Tannerella forsythia, Treponema denticola and Porphyromonas gingivalis (5). These bacteria contribute to periodontal tissue destruction through virulence factors and sustained inflammatory responses (5).

1.2. Classification and clinical manifestations

The classification of periodontal diseases evolved significantly during the 2017 World Workshop in Chicago, dividing conditions into plaque-induced gingivitis and periodontitis (6).

The first is plaque-induced gingivitis, defined as an "inflammatory lesion resulting from the interaction between the dental plaque biofilm and the host's immuno-inflammatory response, limited to the gums and without compromising the periodontal attachment" (6). This condition is reversible once the etiological factors, particularly dental plaque, have been properly eliminated (1,6). The second pathology is periodontitis, a multifactorial chronic inflammatory disease associated with dysbiotic biofilms. It is characterized by the progressive destruction of the tissues that support the teeth. Unlike gingivitis, it is irreversible, however, it can be treated and stabilized (6).

The predominant manifestations of this pathology include a progressive decrease in the support of periodontal tissues, resulting in clinical attachment loss and alveolar bone resorption, which is observable by radiographs. It is also distinguished by the presence of periodontal pockets and gingival bleeding. Without appropriate treatment, this pathology can lead to tooth loss and a form of oral disability, thus compromising chewing function and the aesthetics of the smile. These consequences can lead to social inequalities and compromise the quality of life of patients (7).

1.3. Risk factors and prevention

Periodontal diseases are therefore a major cause of tooth loss and chewing dysfunction, resulting in considerable healthcare costs and a significant impact on overall health.

It is important to emphasize that other mechanisms influence the prevalence and severity of these conditions, including general risk factors such as smoking, alcoholism, diabetes, hormonal imbalances, nutrition, and medications, as well as local factors such as plaque retention and hyposalivation. While not all cases of gingivitis necessarily develop into periodontitis, they remain a precursor to this condition. The prevention and treatment of these conditions are therefore crucial for slowing the progression of periodontal diseases and are a priority in our profession (7).

Dental plaque management is crucial in reducing gingival inflammation and preventing the progression of periodontal disease, as demonstrated by numerous studies. While this assessment can be professionally performed by a dentist, it primarily depends on the patient's daily oral hygiene. Various mechanical techniques can contribute to plaque removal. However, their effectiveness hinges on the regularity and quality of their application (7).

Indeed, inappropriate or irregular brushing, as well as insufficient interdental cleaning, allows residual plaque to persist, which can potentially initiate or maintain periodontal disease. To optimize plaque control without replacing mechanical techniques, the use of chemical aids, such as mouth rinses, could prove beneficial. These solutions vary in composition and allow the oral cavity to be rinsed while exerting an antiseptic action on dental plaque. These interventions are traditionally used for short periods, particularly after surgery, to prevent surgical site infection, or alongside periodontal treatments to optimize results (8,9).

1.4. Role of mouth rinses in periodontal treatment

1.4.1. Mouth rinses as adjunctive therapy

Chemical adjuncts such as mouth rinses have been introduced to enhance plaque control without replacing mechanical methods (10). Mouth rinses allow active agents to exert antiseptic, anti-inflammatory, or protective effects within the oral cavity (11). Traditionally prescribed for short-term use after periodontal or surgical procedures, they are increasingly integrated into daily oral hygiene routines for specific patient populations.

Their use may be particularly beneficial for patients with limited manual dexterity, orthodontic appliances, or increased periodontal risk. Studies suggest improved periodontal outcomes when mouth rinses are combined with mechanical plaque control compared to mechanical methods alone (11,12).

1.4.2. Types of mouth rinses and active agents

Mouth rinses vary widely in composition and intended use. Therapeutic mouth rinses, often containing antiseptics, are prescribed short-term for acute conditions or post-surgical care, while daily-use mouth rinses are designed for long-term preventive benefits such as caries prevention or halitosis control (13).

1.4.2.1. Physico-chemical characteristics of the main components

1.4.2.1.1. Fluoride

Its mode of action in the oral cavity can be systemic, through ingestion during tooth formation, or topical, through contact throughout life. Fluoride has two types of effects on teeth:

- Effect on mineralization: The breakdown of carbohydrates in food by plaque bacteria lead to the formation of organic acids. These acids cause demineralization of tooth enamel by decreasing the ph (12).
- Influence on bacterial metabolism: A decrease in the pH level within plaque significantly increases the sensitivity of bacteria to fluoride. The lower the extracellular pH, the easier it is for fluoride ions to infiltrate the cell (12).

Maximum effectiveness in protecting against caries is achieved through moderate but regular fluoride intake in the oral cavity, ensuring the continuous presence of fluoride ions on the surface of the enamel. Once daily intake reaches 2 mg, there is a risk of dental fluorosis. This explains why fluoride mouth rinses are only recommended for children aged 6 and over, when they are able to spit (12,13).

1.4.2.1.2. Chlorhexidine

Chlorhexidine is the benchmark molecule in the dental field. It is found in mouth rinse solutions in the form of chlorhexidine gluconate or digluconate. This broad-spectrum antiseptic belongs to the biguanide family and has been recognized as the gold standard among chemical agents used to combat dental plaque for many decades. Its effectiveness is based on its bacteriostatic and bactericidal properties (14).
Chlorhexidine has a bactericidal effect at high concentrations, although at low concentrations, it has a bacteriostatic effect (14).
Because of its positive charge, the molecule interacts with the negatively charged bacterial membranes, altering and disrupting membrane proteins. This polarity also gives the molecule remarkable persistence in the oral cavity, which explains its effectiveness as an anti-plaque agent. Chlorhexidine has the ability to adsorb onto various anionic substrates, such as hydroxyapatite, salivary proteins and the oral mucosa. This promotes gradual release of the molecule and a prolonged effect lasting several hours after use (15).

Chlorhexidine has a very high broad spectrum of activity, against both Gram-positive, Gram-negative bacteria and also yeasts. In addition, it has anti-inflammatory, antioxidant, and antifungal properties. Chlorhexidine adheres to the teeth, exerting an inhibitory effect on plaque, as well as to saliva and mucous membranes, thus forming a reservoir that gradually releases the active ingredient as its concentration in the oral cavity decreases (15).

Chlorhexidine also binds to acquired pellicle, which is a component of dental plaque. Chlorhexidine is associated with various adverse effects, such as taste alteration, resulting from the substantivity of chlorhexidine, which causes a change in the surface proteins of taste buds. In addition, it can cause burning due to desquamation of the oral epithelium, viral infections, and risks of staining of the teeth, tongue, and fillings, the latter being reversible upon discontinuation of treatment (14,15).

1.4.2.1.3. Cetylpyridinium chloride

Cetylpyridinium chloride, commonly referred to by the acronym CPC, is a white, odorless powder. It is a cationic quaternary ammonium compound used as a bactericidal antiseptic. Its antiseptic properties are effective in combating dental plaque and gingivitis. Prolonged use of cetylpyridinium chloride (CPC) may cause reversible tooth discoloration, which disappears when use of the mouth rinse is discontinued (16).

1.4.2.1.4. Povidone-iodine

Povidone-iodine is a broad-spectrum antiseptic belonging to the halogenated category. It is an iodophor, meaning an organic complex containing approximately 10% available active iodine. Iodophors cause less irritation and toxicity than alcoholic iodine solutions. Its wide range of activities is related to iodine, which is released slowly and gradually: it has a bactericidal effect on all bacteria, a fungicidal effect on yeasts, and a virucidal effect. Iodophors are unstable in alkaline pH conditions. Iodine in its molecular form has the ability to rapidly cross the cell membrane. Its action results from its oxidizing power, like other halogens, on enzyme and membrane proteins (17).

The main adverse effect is the risk of allergy, which can lead to anaphylactic shock. Abnormal skin discoloration should also be noted. Iodine can also pose risks to the digestive system, particularly when ingested in excessive amounts. Kidney failure may also occur following iodine ingestion (18).

Based on the various criteria mentioned above, mouth rinses can be classified in several ways. However, depending on their intended purpose and duration of use, mouth rinses can be divided into two main categories: therapeutic mouth rinses and daily mouth rinses.

1.4.2.2. Therapeutic mouth rinses: Antiseptic agents

Antiseptics are substances with antimicrobial, antifungal, and antiviral activity against microorganisms present on the skin and mucous membranes. These substances may have anti-inflammatory and healing properties. The use of these agents is generally temporary, lasting from a few days to two weeks. Therapeutic mouth rinses can be classified into four subgroups based on their spectrum of antimicrobial activity and their persistence (19). These are the main antiseptics, which are bactericidal, broad-spectrum, and have a high level of persistence, such as chlorhexidine (20).

The main antiseptics, which have broad-spectrum bactericidal properties and low persistence, such as iodine derivatives, chlorine derivatives, and essential oils. Intermediate antiseptics with narrow-spectrum bactericidal properties and low persistence, such as hexetidine and quaternary ammonium compounds. Minor antiseptics with narrow-spectrum bacteriostatic properties, such as hydrogen peroxide (19,20).

1.4.2.3. Daily-use mouth rinses

These are oral hygiene products intended for long-term or permanent use.

They help protect the oral mucosa against possible infections and preserve teeth against dental caries, while also freshening breath and combating halitosis (11,21).

In accordance with their indications, we identify mouth rinses that protect against tooth decay. These are generally fluoride-based mouth rinses. Desensitizing mouth rinses designed to reduce dentin hypersensitivity. Anti-halitosis solutions: mouth rinses designed to neutralize unpleasant odors (21).

1.5. Current prescribing practices and clinical considerations

Although substantial scientific evidence supports the adjunctive use of mouth rinses in periodontal care, prescribing practices among dental surgeons remain highly variable (22). Differences are observed in the choice of active agents, clinical indications, duration of prescription, and patient instructions. This heterogeneity may be partly explained by varying levels of awareness of alternative formulations, differences in clinical training and experience, as well as the lack of clear and standardized clinical guidelines (22).

Current recommendations emphasize the importance of individualized prescription based on periodontal status, patient-specific risk factors, and tolerance to optimize therapeutic outcomes while minimizing potential adverse effects. However, the extent to which these principles are applied in routine clinical practice remains unclear (11,22).

Given the widespread use of mouth rinses and the variability reported in clinical decision-making, this study aims to evaluate prescribing practices among dental surgeons regarding the use of mouth rinses in the management of periodontal disease.

1.6. Problematic

How does the dentist prescribe mouth rinses to treat the patient?

1.7. Justification

Although many scientific studies have already demonstrated the effectiveness of mouth rinses as adjuncts in periodontal treatment, it remains unclear how these recommendations are applied in daily clinical practice. In theory, mouth rinses such as chlorhexidine are supported by strong evidence for plaque and gingival inflammation control. However, in real life, dentists may prescribe them differently depending on their experience, habits, or perception of effectiveness and side effects. In addition, several alternative formulations are available on the market, but it is not always known whether practitioners are familiar with these options or whether their prescriptions are mainly based on tradition rather than updated evidence. The variability in duration of use, type of mouth rinse selected, and patient instructions may influence both treatment outcomes and the occurrence of adverse effects. For these reasons, it appears relevant to investigate current prescribing practices among dental surgeons and to compare them with the existing scientific literature. This study is therefore justified by the need to better understand how mouth rinses are actually used in periodontal care and whether clinical decisions are aligned with evidence-based recommendations.

1.8. Hypothesis

1.8.1. Primary hypothesis

Mouth rinses are widely used as adjunctive agents in periodontal treatment by dental practitioners.

1.8.2. Secondary hypothesis

- Chlorhexidine-based mouth rinses are the most commonly prescribed formulations in periodontal care due to their perceived effectiveness and tolerance.
- Mouth rinses are typically prescribed for a short-term duration, most frequently ranging from 7 to 10 days with no side effect.

2. OBJECTIVES

2.1. Principal objective

To evaluate the prescribing practices of dental surgeons regarding the use of mouth rinses in the management of periodontal disease.

2.2. Secondary objective

To analyze the perceived role of mouth rinses, according to dentists, in terms of effectiveness and tolerance

3. MATERIAL AND METHODS

To initiate the study project, we require the department's consent, which necessitates the completion of an application form containing all pertinent information regarding our investigative procedures. The project tutor submitted the application form to the department, and we received approval on 17 November 2025. Subsequently, we submitted all documents to the UEM Research Ethics Committee and we received validation on December 1, 2025.

3.1. Study design and type

This research was designed as a descriptive, observational, cross-sectional study.

3.2. Sample size

A survey of 98 participants was executed to evaluate the prescribing practices of dental surgeons regarding the use of mouth rinses in the management of periodontal diseases with a digital survey (Microsoft form).

All the participants were obliged to sign an informed consent before participating in the survey. The questionnaire was available from 08/12/2025 to 14/02/2026.

Microsoft Forms is a free online platform developed by Microsoft that allows to create surveys. It is integrated within the Microsoft 365 ecosystem and was created by Bill Gates in Redmond, Washington.

3.3. Committee approval

The code of committee approval is **OD.030/2526**.

3.4. Use of resources

The source of information used for this research project were scientific platforms: PubMed, Research Gate, Science direct and the Journal of Periodontology.

The keywords used to search for the project were: periodontal disease, mouth rinse, chlorhexidine, dentist prescription mouth rinse, dentistry.

3.5. Criteria used for the research

The table below describes the inclusion and exclusion criteria used to select participants for our study:

Table 1. Inclusion and exclusion criteria for survey participation

Inclusion criteria	Exclusion criteria
▪ Articles published in English	▪ Articles in another language than English
▪ Articles published after year 2015	▪ Articles published before 2015
▪ Consent given on the first page of the survey	▪ Article non available entirely
▪ Survey fully completed	▪ Articles not related to our subject
	▪ Survey not fully completed

Anyone meeting all the inclusion criteria was eligible and anyone who failed to meet any of them was excluded.

3.6. Questions for the survey

The survey consisted of 14 questions (see annexe 1), taking less than 2 minutes to complete. Each of the participants have given their agreement for the results to be used in the study.

After collecting all the responses, we did a descriptive analysis and made graphs to show the most important outcomes. This made it easier to understand and use the survey data.

4. RESULTS

A total of 98 responses were initially collected through the survey. However, five participants did not provide informed consent and were therefore excluded from the analysis. Consequently, 93 responses were retained and included in the final dataset.

The results are presented below according to the structure of the questionnaire and are supported by graphical representations for clarity and ease of interpretation.

As illustrated in Figure 1, all retained participants met the predefined inclusion criteria of the study protocol.

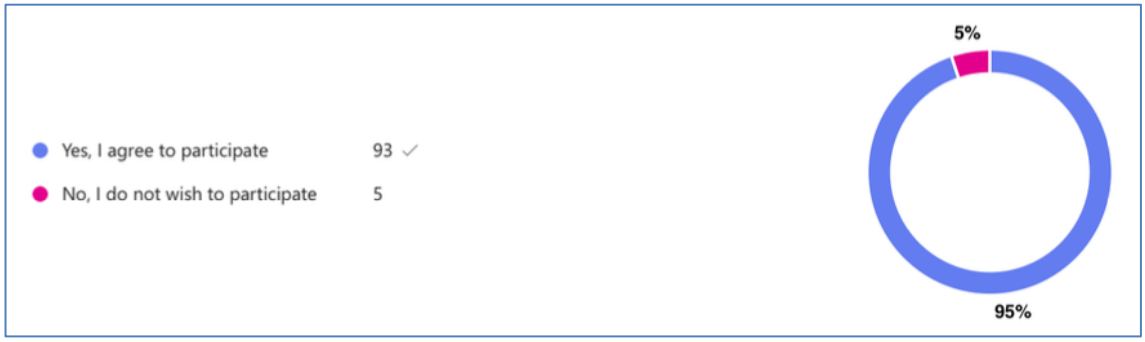


Figure 1. Total number of participants included in the final analysis after exclusion of responses without informed consent.

Participant Characteristics

The professional background of the participants revealed that 61 respondents (66%) were general dentists, while 32 participants (34%) were periodontists. This distribution reflects a predominance of general practitioners within the sample and is illustrated in Figure 2.

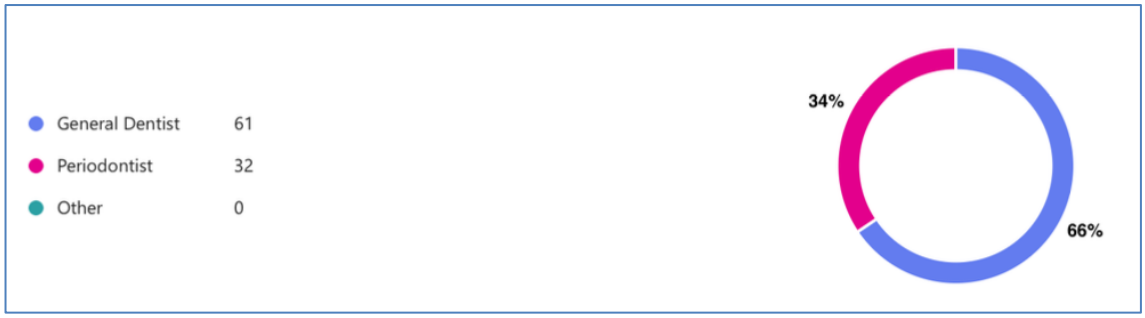


Figure 2. Distribution of participants according to professional specialty.

Mouth rinse Prescription Habits

Participants were asked about their prescribing habits regarding mouth rinses. The majority reported regular prescription practices, with 51 participants (55%) indicating routine use. Additionally, 40 participants (43%) reported occasional prescription, while only 2 participants (2%) stated that they rarely prescribe mouth rinses. Notably, no respondent selected the option "never," suggesting widespread acceptance of mouth rinses as part of clinical management (Figure 3).

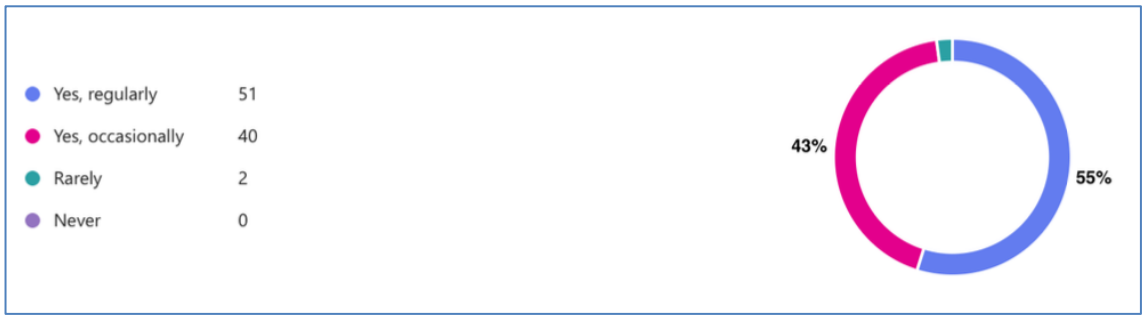


Figure 3. Frequency of mouth rinse prescription among practitioners.

Recommended Frequency of Use

Regarding recommended usage frequency, most practitioners advised twice-daily application (53 participants; 57%), followed by once-daily recommendations (39 participants; 42%). Only one respondent (1%) recommended three daily applications (Figure 4).



Figure 4. Recommended daily frequency of mouth rinse use.

Duration of Prescription

The duration of mouth rinse prescription varied among practitioners. Most respondents (59; 63%) indicated a typical duration of 7 to 10 days. Twenty-four participants (26%) reported that prescription length depended on clinical evolution. Smaller proportions prescribed mouth rinses for 2–3 weeks, more than one month, or short-term use (3–5 days), as illustrated in Figure 5.

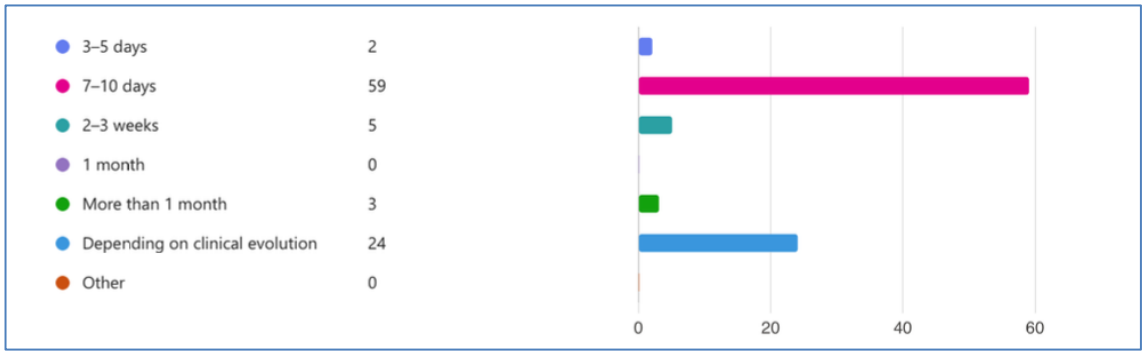


Figure 5. Duration of mouth rinse prescription according to respondents.

Provision of Specific Instructions

When asked whether they provided specific instructions regarding mouth rinse usage, 53 participants (57%) reported offering detailed guidance, whereas 40 participants (43%) indicated that they did not systematically provide such instructions (Figure 6).

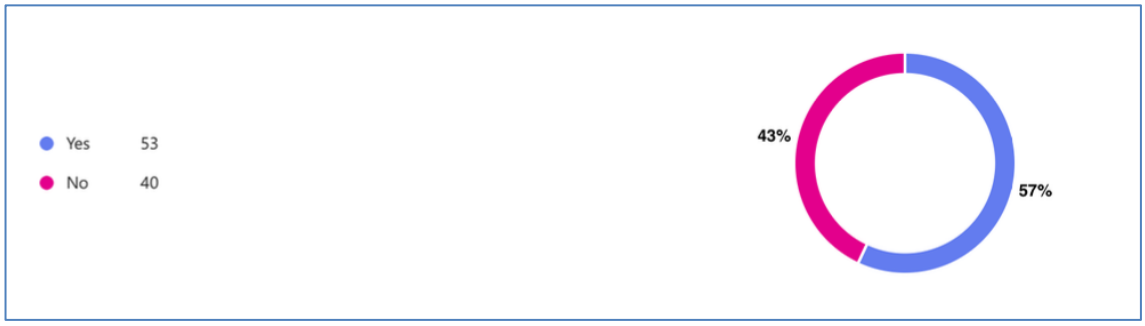


Figure 6. Proportion of practitioners providing specific instructions to patients regarding mouth rinse use.

Types of Mouth rinses Prescribed

Chlorhexidine was the most frequently prescribed mouth rinse (86 responses), followed by fluoride-based formulations (76 responses). Other options, including cetylpyridinium chloride and essential oils, were less commonly selected (Figure 7).

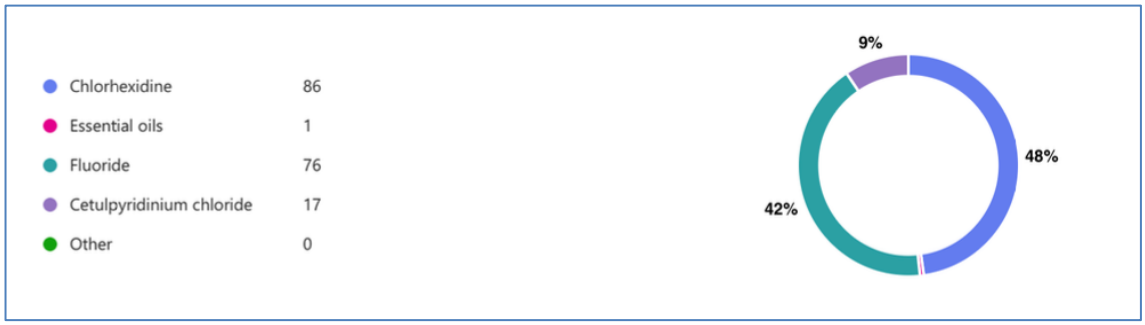


Figure 7. Types of mouth rinses prescribed by practitioners.

Chlorhexidine Concentration Prescribed

Among practitioners prescribing chlorhexidine, the 0.12% concentration was the most commonly recommended (82 participants; 75%), followed by the 0.2% concentration (19 participants; 17%). A minority of respondents reported not prescribing chlorhexidine (Figure 8).

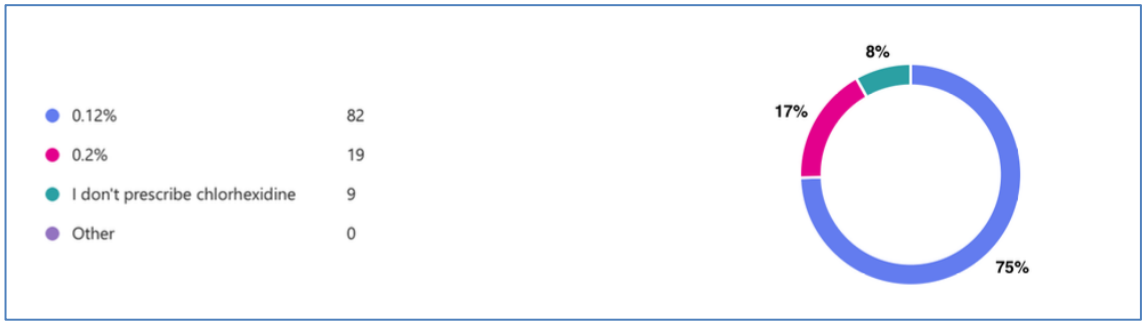


Figure 8. Chlorhexidine concentrations prescribed by participants.

Clinical Indications

Gingivitis emerged as the most frequent clinical indication for mouth rinse prescription (96.8%). Additional indications included halitosis, post-extraction care, scaling and root planning procedures, periodontitis management, and postoperative periodontal surgery. Multiple responses were allowed for this question, and the distribution is shown in Figure 9.

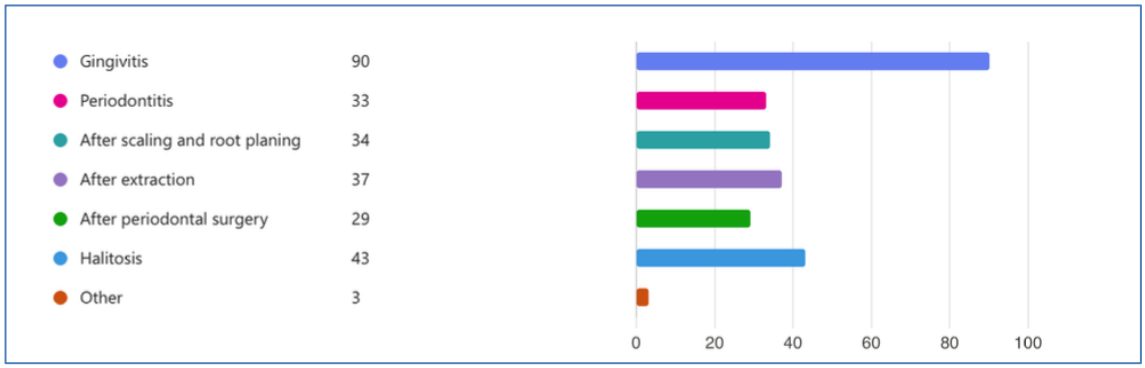


Figure 9. Clinical indications for mouth rinse prescription (multiple responses allowed).

Periodontal Conditions Treated

Gingivitis was also the most frequently treated periodontal condition, followed by aggressive periodontitis, peri-implantitis, and chronic periodontitis (Figure 10).

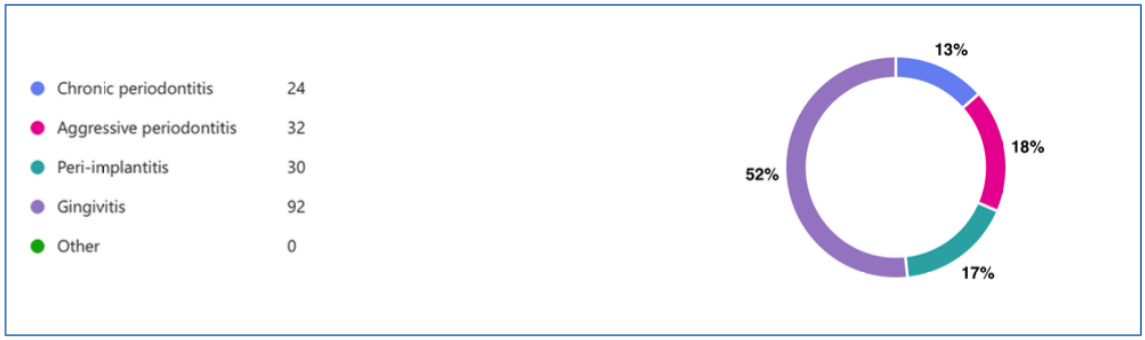


Figure 10. Periodontal conditions treated using mouth rinses.

Perceived Clinical Effectiveness

Most participants perceived mouth rinses as clinically effective. Specifically, 68 practitioners (73%) considered them very effective, while 24 participants (26%) described them as effective. Only one respondent rated them as slightly effective (Figure 11).

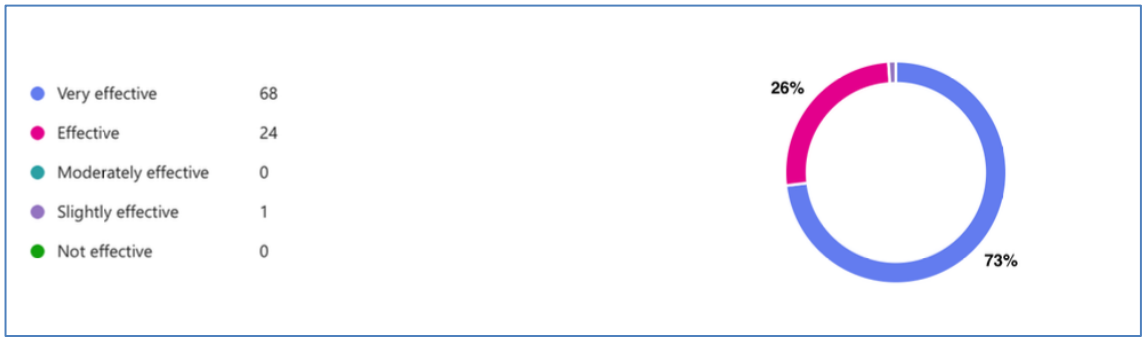


Figure 11. Perceived clinical effectiveness of mouth rinses among practitioners.

Observed Side Effects

Twenty-three participants (25%) reported observing side effects, while 70 (75%) indicated that they had not observed any side effects (Figure 12).

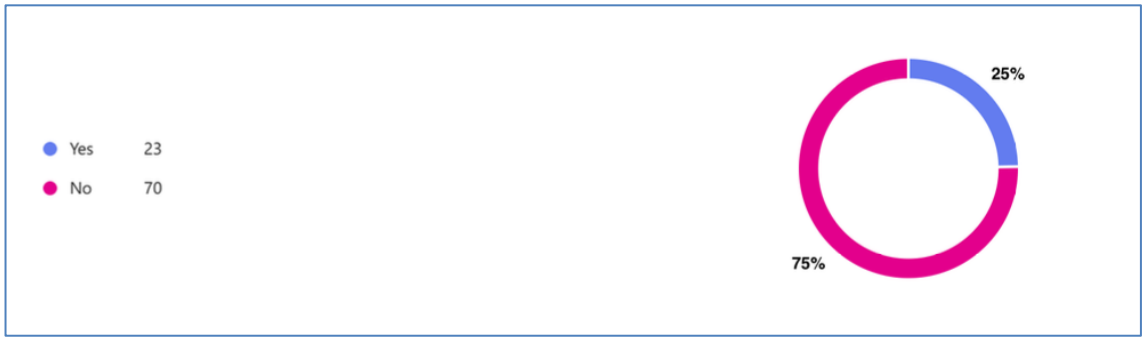


Figure 12. Occurrence of side effects related to mouth rinse use.

Among the practitioners who reported side effects, the majority indicated that they encountered them rarely (18 respondents; 78%), while 4 participants (17%) reported encountering them occasionally, and only 1 participant (4%) reported encountering them frequently. No respondents selected the option "never" within this subgroup, suggesting that adverse effects were generally infrequent but not absent among clinicians who had experienced them.

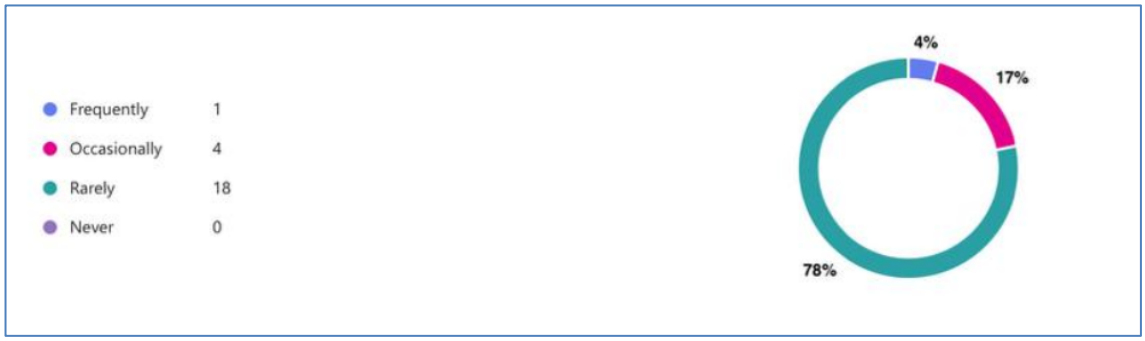


Figure 13. Frequency of observed side effects associated with mouth rinse use.

Factors Influencing Mouth rinse Choice

Clinical evidence was identified as the primary factor influencing mouth rinse selection (72%), followed by consideration of side effects (60.2%), professional experience (52.7%), availability (43%), and cost (26.9%). As this was a multiple-choice question, cumulative percentages exceeded 100% (Figure 13).

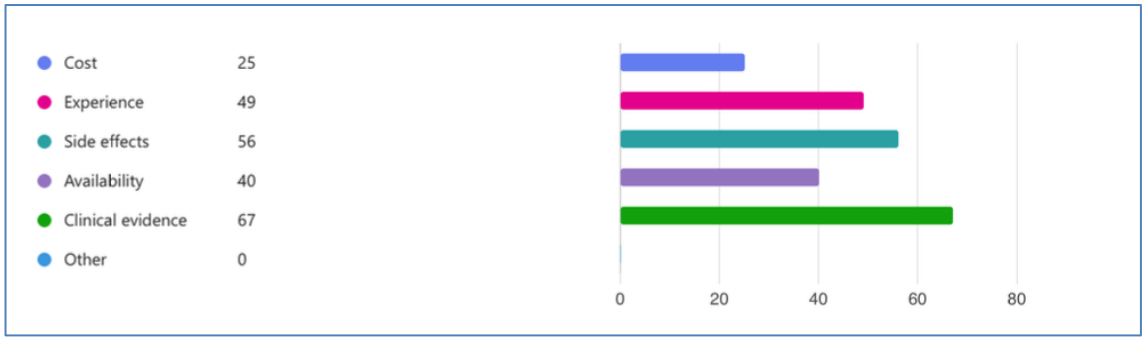


Figure 14. Factors influencing practitioner's choice of mouth rinse.

Perceived Influence on Disease Progression

Finally, participants demonstrated a strong consensus regarding the potential impact of mouth rinses on periodontal disease progression. A total of 74 participants (80%) strongly agreed with this statement, while the remaining 19 participants (20%) agreed (Figure 14).

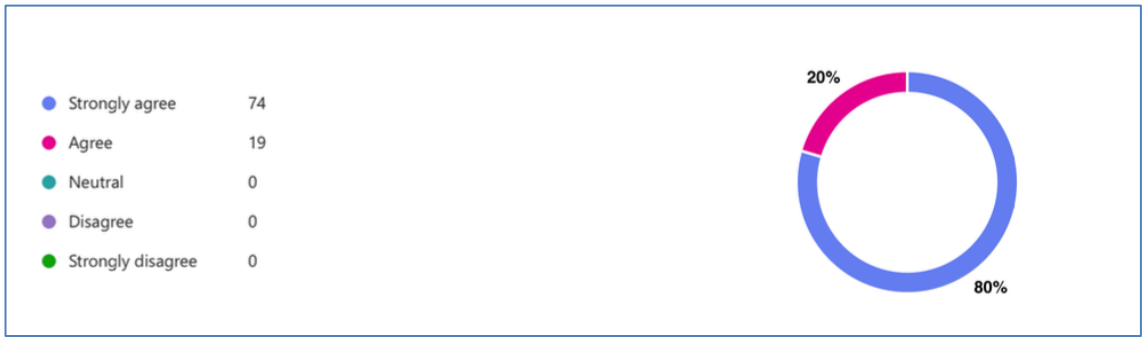


Figure 15. Perceived influence of mouth rinses on periodontal disease progression.

5. DISCUSSIONS

Our survey results mirror many findings from existing literature. The present study aimed to evaluate the prescribing practices of dental surgeons regarding the use of mouth rinses in the management of periodontal disease and to analyze their perceived role in terms of effectiveness and tolerance.

The principal objective was to assess how dental practitioners prescribe mouth rinses in periodontal care. The results demonstrate that mouth rinses are widely integrated into routine clinical practice, as 98% of respondents reported prescribing them either regularly or occasionally. This finding is consistent with Ahmed et al., who reported that most dental professionals routinely recommend antiplaque mouth rinses in periodontal therapy. Their study similarly highlighted the high frequency of prescription and the central role of chemical adjuncts in supporting mechanical plaque control (22).

Moreover, McGrath et al. concluded that mouth rinses do have a clinical role in managing oral diseases, particularly in reducing plaque accumulation and gingival inflammation when used as adjuncts (9). The strong prescription rates observed in the present study support this conclusion and confirm that dentists recognize the adjunctive benefit of mouth rinses in periodontal management (9).

One of the most striking findings in the present study is the predominance of chlorhexidine (92.5%) among prescribed mouth rinses. This aligns closely with Ahmed et al., who also identified chlorhexidine as the most frequently prescribed antiplaque agent among dental professionals. The literature consistently describes chlorhexidine as the gold standard due to its broad antimicrobial spectrum and high substantivity (11).

Tartaglia et al. similarly emphasizes chlorhexidine's effectiveness in controlling plaque and gingival inflammation. However, this same review also highlights the importance of limiting long-term use due to its well-documented adverse effects (23).

Despite the availability of alternative agents such as cetylpyridinium chloride and essential oils, their prescription rates in the present study were considerably lower.

5.1. Duration of Prescription and Clinical Indications

Most practitioners in the present study reported prescribing mouth rinses for 7–10 days. This short-term prescription is consistent with current recommendations found in McGrath et al., which suggest using antiseptic mouth rinse for a limited period (between 7-14 days) (9).

Gingivitis was identified as the primary indication for mouth rinse prescription. By comparison, Tartaglia et al. also reinforces that antiseptic mouth rinses are particularly effective in controlling gingival inflammation, further supporting the high prevalence of gingivitis as the leading indication in this study (23).

5.2. Perceived Effectiveness

In the present survey, the majority of dentists considered mouth rinses very effective. This strong positive perception reflects a high level of clinical confidence.

Brookes et al. reported that mouth rinses can significantly reduce plaque and gingival indices when used alongside mechanical cleaning (11). Similarly, Tartaglia et al. confirms their adjunctive effectiveness, particularly in patients with inadequate plaque control (23).

5.3. Side Effects and Tolerance

Although 25% of respondents reported observing side effects, the majority described them as rare. This suggests that while adverse reactions exist, they are not commonly encountered in daily practice.

The literature, including Brookes et al., clearly describes common chlorhexidine-related side effects such as staining, taste alteration, and mucosal irritation (11). McGrath et al. also emphasize that while chlorhexidine is effective, prolonged use increases the risk of adverse events (9).

The relatively low rate of reported side effects in this study may be explained by the predominance of short-term prescriptions. Therefore, the hypothesis stating that mouth rinses are prescribed without side effects is partially confirmed, as adverse events were observed but generally described as infrequent.

5.4. Factors Influencing Prescription Decisions

The majority of practitioners indicated that clinical evidence and side effects were the main factors influencing their choice of mouth rinse.

Ahmed et al. observed that although clinicians claim to base their decisions on evidence, their knowledge of alternative agents is sometimes limited (22). This potential discrepancy suggests that while evidence is valued, prescribing patterns may still rely heavily on habits and professional experience.

The findings from the present study support this interpretation. While practitioners prioritize evidence and safety, the limited diversification of prescribed agents suggests that further professional education and updated clinical guidelines may enhance individualized and evidence-based decision-making (22).

5.5. Influence on Periodontal Disease Progression

All practitioners agreed that mouth rinses can influence periodontal disease progression. This unanimous perception reflects strong confidence in their therapeutic contribution.

Although the literature acknowledges that mouth rinses are adjunctive rather than primary treatments, their role in reducing microbial load and gingival inflammation supports their contribution to controlling disease progression when combined with mechanical therapy (9, 11, 12).

5.6. Limitations

This study presents several limitations that should be considered when interpreting the results. First, the sample size was relatively limited, with only 93 responses included in the final analysis. Although this number allowed for a descriptive overview of prescribing practices, it may not be sufficient to fully represent the diversity of dental practitioner's behaviors.

Second, the use of a convenience sample obtained through an online questionnaire may introduce a selection bias. Dentists who chose to participate might have a greater interest in periodontal care or in the use of mouth rinses, which could influence the results.

Additionally, the cross-sectional design of the study only reflects practitioner's responses at a specific moment in time and does not allow for evaluation of changes in prescribing habits over time. Self-reported data may also be subject to response bias, as participants may provide answers that reflect recommended practices rather than their actual clinical behavior.

6. CONCLUSION

1. Mouth rinses are widely prescribed by dentists as adjunctive agents in periodontal treatment, demonstrating their strong integration into clinical practice.
2. Chlorhexidine remains the most frequently prescribed mouth rinse due to its well-established antimicrobial efficacy and its recognized role as the gold standard for chemical plaque control. The results confirm the primary hypothesis that mouth rinses are frequently used as a treatment for periodontal disease.
3. The duration of prescription is generally limited to short-term use, most commonly between 7 and 10 days, which is consistent with current clinical recommendations aimed at minimizing adverse effects.
4. Dentists report a high level of confidence in the effectiveness of mouth rinses, particularly for the management of gingivitis and inflammatory periodontal conditions.

Although adverse effects such as staining or taste alteration may occur, they are generally perceived as infrequent in daily clinical practice. The existence of documented adverse effects suggests that tolerability must be carefully considered.

However, the prevalence of a single active agent and the variability in patient instructions highlight the importance of continued professional education and clinical guidelines more individualized for periodontal care.

5. SUSTAINABILITY

Considering its potential contribution to sustainability, the use of mouth rinses in periodontal treatment can be examined through the three complementary dimensions of sustainable development: social, economic, and environmental sustainability, particularly in relation to SDG 3 (Good Health and Well-Being), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action).

From a social perspective, the appropriate prescription of mouth rinses may support the prevention and control of periodontal diseases, which are highly prevalent and significantly affect quality of life, oral function, and psychosocial well-being. When used as an adjunct to mechanical plaque control, mouth rinses can contribute to reducing gingival inflammation and limiting disease progression, potentially decreasing tooth loss and promoting improved oral health outcomes. In this context, rational and evidence-based prescribing practices align with broader public health objectives and are consistent with SDG 3 (Good Health and Well-Being).

From an economic view, preventive and maintenance-oriented periodontal strategies may reduce the need for more complex and costly interventions, such as advanced periodontal therapy, surgical procedures, or prosthetic rehabilitation following tooth loss. Evidence-based prescription adapted to individual patient needs may also help avoid unnecessary or prolonged use of products, thereby optimizing resource utilization and contributing to more efficient healthcare delivery. This dimension is particularly relevant to SDG 12 (Responsible Consumption and Production), as it promotes more rational use of healthcare products and resources.

From an environmental perspective, sustainability challenges relate to the manufacturing processes, packaging materials, and disposal of mouth rinse products, particularly regarding plastic waste and potential environmental impact of chemical components. Encouraging appropriate prescription practices, limiting overuse, promoting eco-designed or alcohol-free formulations when clinically suitable, and educating patients on responsible use may help reduce environmental burden. These concerns are closely linked to SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). Evaluating dentists prescribing behaviors is therefore essential to identify opportunities for more sustainable periodontal care practices that balance clinical effectiveness with social responsibility, economic efficiency, and environmental awareness.

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7. ANNEXES

Annexe 1. Survey on the use of mouth rinse in periodontal treatments.

Dear colleagues,

This survey is part of a Graduation Project in Dentistry at Universidad Europea de Madrid, titled **"Use of Mouth rinses in Periodontics"**, directed by Prof. Lorena Masia.

The purpose of this work is to evaluate the use and prescription patterns of mouth rinses by dentists in the treatment and maintenance of periodontal health. Participation in this study is voluntary, and you may withdraw at any time without justification.

All collected data will remain strictly confidential, anonymous, and used only for research purposes in accordance with Organic Law 3/2018, of December 5, on the Protection of Personal Data and Guarantee of Digital Rights.

For any inquiries, please contact Professor Lorena Masia: **lorena.masia@universidadeuropea.es**

Question 1: Do you consent to participate in this survey as a volunteer, for the results to be used in the Final Degree Project "Use of Mouth rinses in Periodontics"? By clicking "Yes, I agree to participate", you consent to take part in this study and will have access to the questionnaire. By clicking "No, I do not wish to participate", you will exit the form.

Answers:

A. Yes, I agree to participate
B. No, I do not wish to participate

Question 2: What is your specialty?

Answers:

A. General Dentist
B. Periodontist
C. Other, please specify…

Question 3: Do you prescribe mouth rinse to your patients?

Answers:

A. Yes, regularly
B. Yes, occasionally
C. Rarely
D. Never

Question 4: What daily frequency of mouth rinse use do you recommend to your patients?

A. Once a day
B. Twice a day
C. Three times a day
D. Other, please specify…

Question 5: What is the average duration of your mouth rinse prescriptions?

A. 3-5 days
B. 7-10 days
C. 2-3 weeks
D. 1 month
E. More than 1 month
F. Depending on clinical evolution
G. Other, please specify…

Question 6: Do you give specific instructions on how to use mouth rinses?

Answers:

A. Yes
B. No

Question 7: Which types of mouth rinses do you usually prescribe?

Answers:

A. Chlorhexidine
B. Essential oils
C. Fluoride
D. Cetulpyridinium chloride
E. Other, please specify…

Question 8: Which concentration of Chlorhexidine do you prescribe?

Answers:

A. 0.12%
B. 0.2%
C. I don't prescribe chlorhexidine
D. Other, please specify…

Question 9: In which situations do you prescribe mouth rinses?

Answers:

A. Gingivitis
B. Periodontitis
C. After scaling and root planning
D. After extraction
E. After periodontal surgery
F. Halitosis
G. Other, please specify…

Question 10: Which periodontal conditions do you treat with mouth rinses?

Answers:

A. Chronic periodontitis
B. Aggressive periodontitis
C. Peri-implantitis
D. Gingivitis
E. Other, please specify…

Question 11: Do you observe clinical improvement with mouth rinse use?

Answers:

A. Very effective
B. Effective
C. Moderately effective
D. Slightly effective
E. Not effective

Question 12: Have you observed any side effects related to mouth rinse use?

Answers:

A. Yes
B. No

Question 13: How often do you encounter side effects such as staining, taste alteration or mucosal irritation?

Answers:

A. Frequently
B. Occasionally
C. Rarely
D. Never

Question 14: Which factor(s) influence your choice of mouth rinse?

Answers:

A. Cost
B. Experience
C. Side effects
D. Availability
E. Clinical evidence
F. Other, please specify…

Question 15: Do you believe that mouth rinses can influence periodontal disease progression?

Answers:

A. Strongly agree
B. Agree
C. Neutral
D. Disagree
E. Strongly disagree

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