Acta Biologica Marisiensis

PUBLIC KNOWLEDGE AND PERCEPTIONS OF PHYTOTHERAPEUTIC APPROACHES FOR ORAL CAVITY DISORDERS

Anda LUCA[1], Dragoș SITA[2], Ruxandra ȘTEFĂNESCU[3*]

[1]Faculty of Pharmacy, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Târgu Mureș, Romania
[2] Department of Odontology and Oral Pathology, Faculty of Dental Medicine, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Târgu Mureș, Romania
[3]Department of Pharmacognosy and Phytotherapy, Faculty of Pharmacy, George Emil Palade University of Medicine, Pharmacy, Science and Technology of Târgu Mureș, Romania

*Correspondence:
Ruxandra ȘTEFĂNESCU
ruxandra.stefanescu@umfst.ro

Received: 17 September 2025; **Accepted:** 10 October 2025; **Published:** 30 December 2025

Abstract: Oral cavity disorders are frequently encountered among the general population. If left untreated they can produce serious health risks. Phytotherapy represents a valuable complementary approach in oral healthcare, with herbal remedies being widely used for different conditions. Despite their availability, the level of public knowledge regarding the safe and effective use of phytotherapeutic products remains underexplored. This study aimed to evaluate the knowledge, perceptions, and attitudes of the general population toward the use of phytotherapeutic treatments for oral cavity disorders. A cross-sectional survey was conducted among 178 respondents from the general population. Data were collected using a structured questionnaire assessing awareness of phytotherapeutic products, sources of information, perceived efficacy, and attitudes toward their use. Younger participants and those with higher education levels demonstrated significantly better awareness. Pharmacists (47.3%) are considered the most influential professional sources of recommendation. General attitudes were favorable, with 62.2% of respondents open to using herbal remedies as alternatives or complementary, and 65.7% recognizing their preventive potential. Phytotherapeutic products are perceived as safe, effective, and acceptable by the general population for the prevention and management of mild oral conditions. Their integration into oral care is best achieved under professional supervision, with emphasis on standardized formulations and evidence-based guidance.

Keywords: phytotherapy, oral cavity, public knowledge, pharmacist perception

1. Introduction

Oral health is an essential component of general well-being, with disorders such as gingivitis, stomatitis, oral candidiasis, and recurrent aphthous ulcers affecting a large number of the population worldwide. Conventional therapies often include antibiotics, antifungal, antiseptics, anti-inflammatory drugs, etc., that can be limited due to side effects or patient concerns about their safety (Vieira Colombo et al. 2016; Di Stefano et al. 2022; Shinkai et al. 2024). Complementary and/ or alternative therapies have gained an increased interest in the recent years. Phytotherapy has a long tradition in the

management of oral conditions and is frequently preferred due to the general impression that natural products are safer (Janakiram et al. 2020; Shinkai et al. 2024). There are several classes of phytochemicals used in herbal-based products used for different disorders. Herbal products that contain mucilage can be part of multicomponent preparations, associated with various other substances, because mucilages increase the contact time of these substances in the oral cavity, potentiating their effect. These combinations are useful in treating various conditions such as stomatitis, aphthous ulcers, etc. *Althaea officinalis*, *Malva sylvestris*, *Linum usitatissimum* and *Cetraria islandica* are often used as mucilage-containing herbal products (Miranda-Rius et al. 2015; Kręgielczak et al. 2023). Herbal products rich in tannins are well recognized for their astringent, antiseptic, and hemostatic properties. In oral healthcare, they are commonly applied in the management of stomatitis and gingivitis, particularly in the form of mouth rinses or gargles. Their therapeutic action is attributed to the ability of tannins to precipitate proteins on the surface of oral mucosa, thereby forming a thin protective film that protects the mucous membranes but also contributes to reducing gingival inflammation and controlling bleeding, while limiting microbial colonization and supporting tissue healing (Chandra Shekar et al. 2015; Ployon et al. 2018; Kováč et al. 2022). Several tannin-containing plants are traditionally used in oral care products: *Quercus robur*, *Camellia sinensis*, and *Punica granatum* (Venkateswara et al. 2011; Dabholkar 2016; Ștefănescu et al. 2022). Another important class of natural products are essential oils, with proven antimicrobial, anti-inflammatory, analgesic, and antioxidant properties, making them suitable for the prevention and management of various oral conditions. Their volatile compounds, such as terpenes, phenols, and aldehydes, interfere with microbial cell membranes, inhibit biofilm formation, and modulate local inflammatory responses. In dentistry and oral care, essential oils are most frequently used as components of mouth rinses, gels, or toothpastes, with applications in halitosis, gingivitis, periodontitis, dental plaque control, and mucosal infections. Some of the most popular essential oils include clove, peppermint, tea tree, thyme, cinnamon, and oregano (Kavanaugh and Ribbeck 2012; Marchese et al. 2016; Kerekes et al. 2019; Haro-González et al. 2021). However, despite their widespread use, public knowledge regarding the appropriate application, dosage, potential interactions, and safety concerns of phytotherapeutic treatments remains insufficiently studied. Misconceptions and reliance on non-professional sources of information may compromise treatment outcomes and there could be an increased risk to patient safety. Evaluating the population's knowledge and perceptions is therefore crucial in identifying educational needs and guiding healthcare professionals in providing evidence-based recommendations. The present study aims to assess the awareness, knowledge, and attitudes of the general population regarding the use of herbal-based treatments for oral cavity disorders. By analyzing socio-demographic influences and sources of information, this research wants to highlight existing knowledge gaps and provide a foundation for targeted public health interventions in oral health care. Although public interest in phytotherapy has grown across Europe, most existing studies assessing perceptions and attitudes toward herbal products have been conducted in Western countries. There is a lack of data from the Eastern and Central European populations, where cultural traditions regarding herbal-based products remains strong. To our knowledge, no published studies have

systematically explored the general public's view regarding herbal-based products for oral health in Romania, making this study, one of the first to address this gap. The present study aims to add a novel perspective to the current body of literature.

2. Materials and Methods

A cross-sectional study was conducted using an online questionnaire distributed between December 2024 and February 2025. The distribution of the questionnaire was approved by the Ethics Committee of the George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Târgu Mureș (Approval No. 3414/21.11.2024). Participation was voluntary and anonymous. By completing the questionnaire, respondents provided informed consent for the processing of their data. No exclusion criteria related to profession or educational level were applied, in order to capture the perception of the general public as accurately as possible. The questionnaire was disseminated online without targeting a specific population subgroup. The questionnaire included 37 items, organized into 6 thematic sections, that are presented in **Table 1**. Most items were formulated as ordinal Likert-scale questions, allowing respondents to indicate their degree of agreement or frequency on a scale of up to seven points, typically with 3–5 response options. Several questions permitted multiple responses (checkbox format), while a smaller number were open-ended items, enabling participants to provide additional qualitative input.

Table 1. Structure of the questionnaire and types of data collected

No.	Section	Items	Collected data	Sample questions/ Format of responses
1	Sociodemographic data	1-5	age, gender, education, place of residence, and occupation	*,,What is your gender?''/* single choice
2	History of oral conditions and treatment behaviors	6-12	frequency and types of oral conditions, use of plant-based products, source of recommendation	*,,How often do you use herbal-based products for oral hygiene?''/* single choice
3	Perceived efficacy and safety	13-17	comparative evaluation versus conventional medicines, subjective perceptions of health improvement	*,,To what extent do you consider herbal products to be effective compared to conventional medical treatment?''/* single choice
4	Adverse effects and information preferences	18-24	negative experiences, trust in information sources, preferences regarding professional counseling	*,, What side effects, if any, have you experienced following the use of herbal products for oral health issues?''* / multiple choice & open-ended
5	General attitudes toward phytotherapy	25-36	comparative trust versus conventional products, intention to recommend, perceived effective products, suggestions	*,,Which medicinal plants do you consider to be the most effective for conditions affecting the oral cavity?''/* multiple choice
6	Open comments	37	additional suggestions or opinions	*,, Do you have any other suggestions or comments related to herbal therapy products that you would like to share?''* / open-ended

3. Results and discussions

3.1. Sociodemographic data

A total of 178 respondents participated in the study, including both adults and a small proportion of individuals under 18 years of age. Age emerged as a key variable in the analysis, as it allowed for the observation of potential differences between age groups and provided deeper insight into how this factor might influence respondents' opinions. The largest proportion belonged to the 18–24 years age group (39.3%), highlighting the predominant participation of young adults. The next most represented category was 25–34 years (20.8%), followed by respondents aged 45–54 years (16.9%).

With regard to gender distribution, women were strongly overrepresented, accounting for 83.0% of the sample, while men represented only 18.0%.

Educational level also varied: 44.4% of participants reported having a university degree, 21.3% had completed high school, and 18.5% held postgraduate qualifications. In terms of professional background, 56.7% of respondents were from non-medical fields, whereas 38.2% were affiliated with the medical sector. A smaller fraction reported working as freelancers.

Place of residence showed that 64.4% of participants lived in urban areas, while 35.4% resided in rural areas. This distinction is relevant, as urban–rural differences may influence not only lifestyle but also access to information and educational opportunities. These demographic characteristics provide essential context for interpreting participants' knowledge, attitudes, and behaviors regarding phytotherapy in oral healthcare. The sociodemographic data indicates that young, educated, and urban living respondents were more engaged in the study, which is consistent with findings from other surveys on complementary medicine, where younger and more educated groups often report greater interest in natural health solutions (Shinkai et al. 2024).

3.2. History of oral conditions and treatment behaviors

Regarding the most frequent oral disorders mentioned by the respondents, aphthous ulcers where the most common (41.9%), followed by gingival bleeding (40.9%), oral inflammation (23.7%), halitosis (21.5%), and dental infections (16.1%), with lower frequencies for oral candidiasis and herpes. These results are comparable to the findings reported by Cunha et al. and Alhindi et al., suggesting a similar prevalence pattern across different populations (Alhindi et al. 2019; Zimmer et al. 2024).

Regarding treatment behaviors, 48.3% of participants indicated that they had used phytotherapeutic products for oral disorders, while 51.7% had not. This relatively balanced distribution may reflect either a lack of awareness about plant-based products for oral care or a preference for conventional pharmaceutical treatments, which are more familiar to the general population. Interestingly, country-specific differences have been observed: for instance, a study conducted in the United States reported that only 12.6% of respondents had used plant-based products for oral conditions, highlighting potential cultural and healthcare-related influences on treatment choices (Abebe et al. 2011).

When asked about the conditions for which phytotherapeutic products were used, respondents most frequently mentioned aphthous ulcers (68.4%), followed by gingivitis (24.2%), halitosis (11.6%), and stomatitis (10.5%). In terms of product type, herbal teas (56.1%) were the most commonly employed, followed by tinctures (44.7%) and gels (36.0%). Less frequently, respondents reported the use of essential oils (21.9%) or herbal mouthwashes (0.9%). These findings suggest

that herbal teas are perceived as both effective and easily accessible options for maintaining oral health.

With respect to frequency of use, the majority of respondents reported using phytotherapeutic products only “sometimes” (33.9%) or “rarely” (33.3%), whereas only 11.1% reported “frequent” use, and a very small proportion indicated that they “always” used such products. This distribution may reflect a limited awareness of the potential benefits of phytotherapy in oral hygiene and disease management.

As sources of recommendation, the pharmacist was identified as the most influential source (47.3%), followed by friends (31.1%), medical professionals (20.3%), and social media (19.6%). These findings underscore the key role of pharmacists in guiding patient decisions, likely due to their accessibility and credibility in relation to drugs and food supplements. This reflects the trust that the respondents offer to pharmacists, although the general impression of pharmacists towards their profession is not the same. Pharmacists are seen as patient-centered communicators which is supported by recent nationwide surveys among community pharmacists, emphasizing their need for enhanced training in patient-centered communication strategies (Chang et al. 2000; Rusu et al. 2022; Al-Kubaisi et al. 2025). The significant influence of friends highlights the impact of personal experience and peer communication, while the lower ranking of physicians suggests either a preference for more accessible sources of advice or the perception that phytotherapeutic products do not require medical prescription. Automedication, however, raises important concerns due to misuse, inappropriate dosing, allergic reactions, side effects and drug-herb interactions. Even for well-known plant species, severe consequences can be seen when the treatment is not supervised. Extracts of sage, chamomile, or licorice, for example, administered internally, may potentiate anticoagulant effects or interfere with metabolic pathways, increasing the risk of unwanted systemic consequences, while herbal drugs with a high tannin content or mucilage content can decrease the absorption of other drugs, if administered internally but also when applied topic, on the oral mucosa (Hu et al. 2005; Izzo 2005; Fasinu et al. 2012).

3.3. Perceived efficacy and safety

When asked to evaluate the efficacy of phytotherapeutic products compared with conventional treatments, the majority of respondents expressed a positive perception. Specifically, 57.2% considered such products effective, and 12.0% very effective, reflecting positive personal experiences. A further 28.3% rated them as neutral, suggesting either insufficient exposure or lack of confidence due to limited knowledge. Only 2.4% of participants perceived them as ineffective, which may be explained by expectations of a faster therapeutic effect or a stronger preference for pharmaceutical alternatives. With respect to oral health outcomes, 64.4% of respondents reported perceivable improvements following the use of phytotherapeutic products. In contrast, 26.8% were unsure, which may reflect occasional or inconsistent use, or difficulties in attributing observed benefits to the product itself. Reported beneficial effects included reduction of inflammation (54.2%), improved oral hygiene (38.9%), fresher breath (29.9%), and reduced dental sensitivity (25.7%) (**Fig. 1.**). Only a small minority reported no significant change, suggesting that herbal products are generally perceived as supportive adjuvants in maintaining oral health.

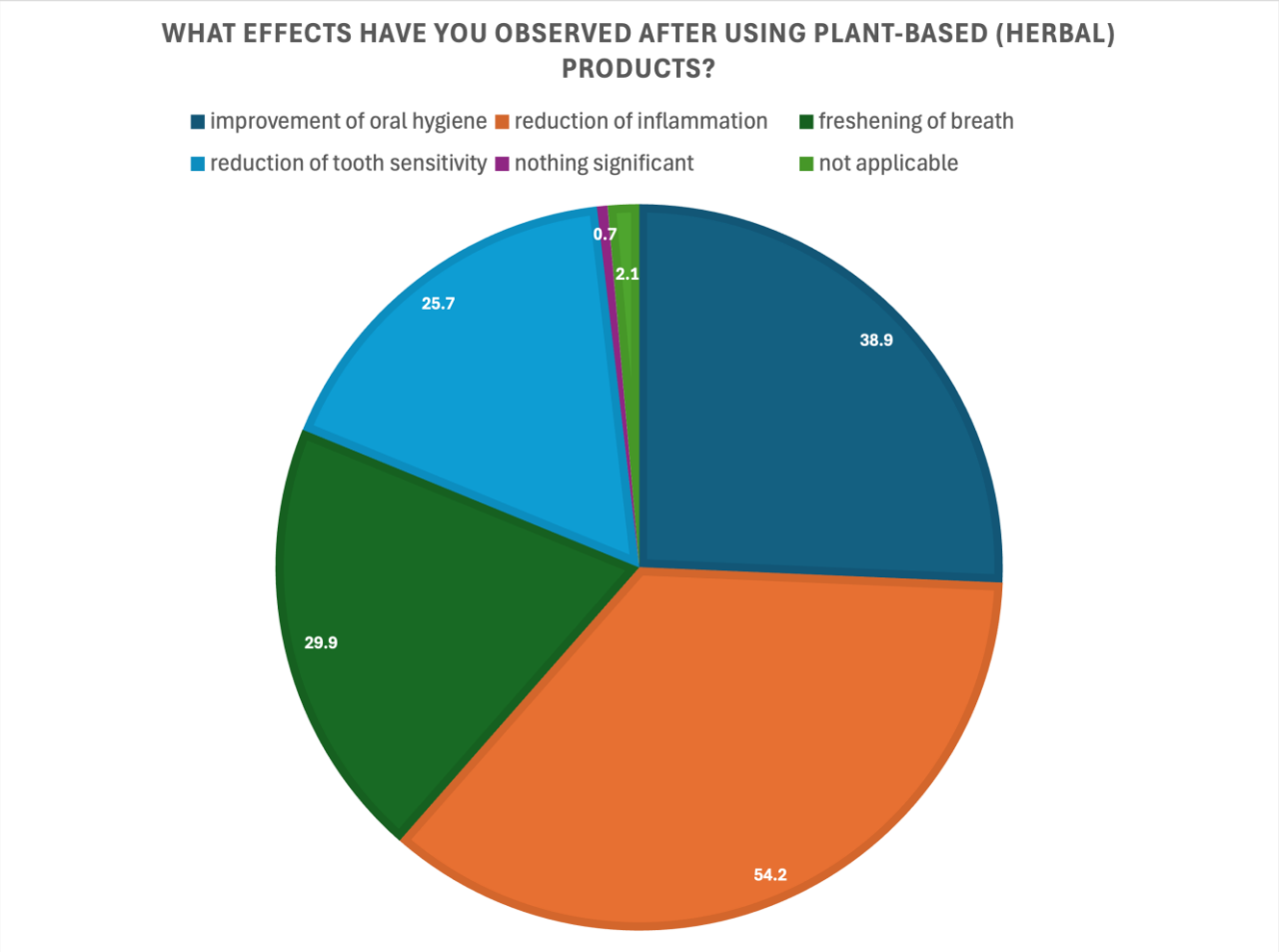

Fig. 1. Participants' responses on the effects of herbal products (multiple choice question)

When asked about the main advantages of phytotherapeutic products, respondents highlighted natural ingredients (60.2%), absence of side effects (46.0%), efficacy in treating oral problems (39.1%) and antimicrobial properties (39.1%). These responses emphasize the role of "natural origin" and perceived safety as strong factors for use.

In terms of safety perception, most participants considered phytotherapeutic products to be safe (53.3%) or very safe (22.8%), while 19.2% remained neutral. Only a very small proportion regarded them as unsafe. This perception over the safety profile of natural products increases the risk towards self-medication, and can lead to common mistakes like either therapeutic inefficiency or to the appearance of side effects, overdosing, etc (Hussain 1999; Consolini and Ragone 2010; Fainzang 2014).

3.4. Adverse effects and information preferences

The vast majority of respondents (95.5%) reported no adverse reactions following the use of phytotherapeutic products for oral conditions, while only 4.5% experienced negative effects. Among these, the most frequently mentioned were oral discomfort (21.1%), allergic reactions (15.8%), and local irritation (15.8%). The low incidence and mild nature of these events indicate that phytotherapeutic products are generally well tolerated and considered safe. Nevertheless, the occurrence of such reactions underscores the importance of proper labeling, awareness of product composition, and cautious use among individuals with known allergies.

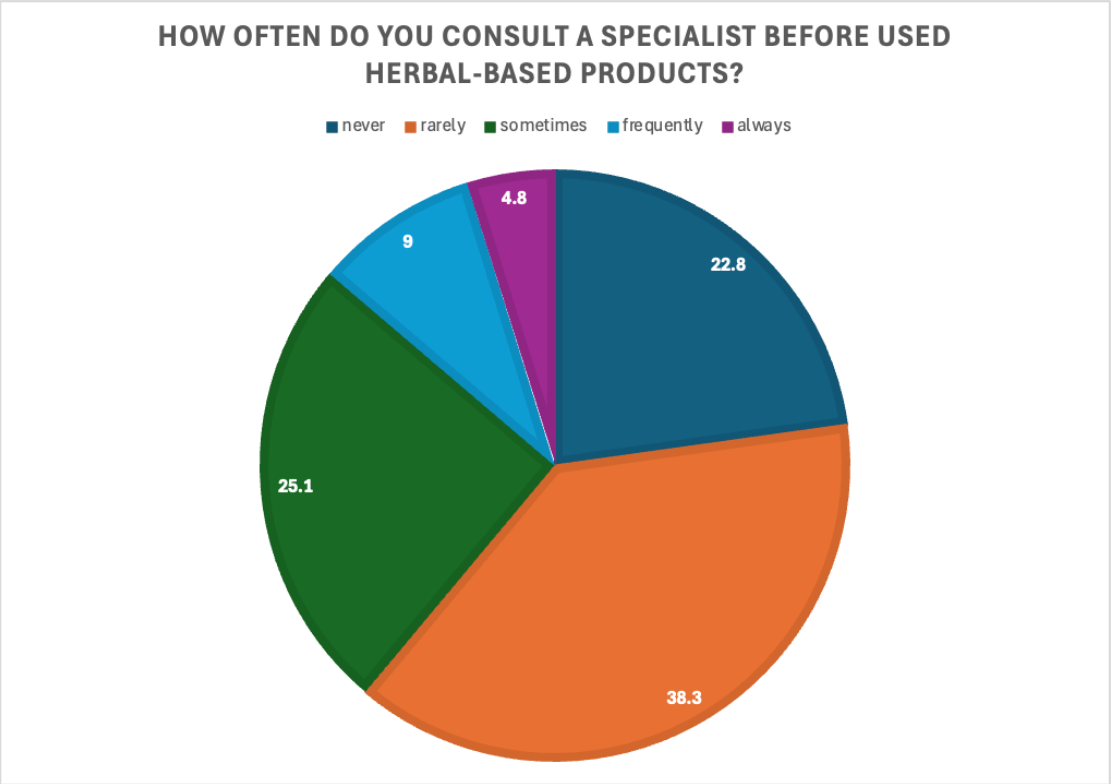

Fig. 2. Consultation frequency prior to using plant-based products

When asked about their willingness to receive professional guidance on phytotherapeutic products for oral health, the majority (86.6%) expressed a positive attitude, reflecting openness to professional advice and a preference for safe, informed use. However, 13.4% indicated no interest in specialist counseling, which may suggest limited awareness of potential risks or a tendency toward self-medication (Hussain 1999; Izzo 2005; Fainzang 2014). Regarding consultation practices, a considerable proportion of respondents admitted that they asked for professional advice rarely (38.3%), sometimes (25.1%), or never (22.8%). Only a small minority asked specialists frequently (9.0%) or always (4.9%) (**Fig. 2.**). These results suggest that many individuals perceive herbal products as mainly harmless and therefore not requiring professional supervision. Trust in dental professionals was also assessed. 41.9% of respondents reported a high level of trust in dentists' recommendations, while 45.9% expressed moderate trust. Lower trust levels were reported by 9.3%, and only a negligible fraction indicated complete lack of trust. Similar studies have found that a majority of adults demonstrate trust in their dentists and broader reviews indicate that trust leads to better patient engagement, reduced anxiety and the patients will obtain an improved oral health outcome (Armfield et al. 2017; Song et al. 2020).

3.5. General attitudes toward phytotherapy

The overall perception of respondents toward phytotherapeutic products for oral health was predominantly positive. When asked to compare their effectiveness with conventional medicines, 62.2% of participants answered "Yes," indicating openness to using herbal remedies either as an alternative in mild cases or as complementary therapy. These results are in accordance with the results obtained in clinical trials, that herbal-based treatments have a comparable efficiency in oral

health care with conventional therapy (Janakiram et al. 2020; Chatzopoulos et al. 2022). A smaller proportion (12.8%) expressed skepticism, reflecting a preference for conventional treatments and a perception that herbal products cannot substitute them. Meanwhile, 25.0% selected "I don't know," suggesting a significant proportion of respondents remain undecided, likely due to limited knowledge or insufficient personal experience.

Regarding safety, 42.4% of respondents perceived herbal products to be safer than conventional treatments, likely because of their natural ingredients and the belief that they cause fewer side effects. By contrast, 22.7% disagreed, possibly due to personal experiences with allergic or unwanted reactions. Interestingly, 42.4% responded "I don't know," indicating widespread uncertainty about the risk–benefit profile of phytotherapy. The factors most strongly influencing respondents' willingness to use phytotherapeutic products were medical recommendation (84.7%), followed by perceived efficacy (45.9%), and recommendations from family or friends and lower cost (14.4%). These results confirm the central role of healthcare professionals in shaping patient decisions, even for non-prescription natural products. Respondents also identified specific medicinal plants considered most effective for oral conditions. The most frequently chosen were chamomile (67.1%), propolis (61.7%), mint (46.7%), and sage (46.1%), all traditionally known for their anti-inflammatory, antiseptic, and soothing properties. Other popular options included aloe vera (54.5%) and echinacea (19.8%), suggesting openness to more recently promoted or "modern" herbal therapies. The influence of traditional medicine is evident, although global trends are also shaping preferences, as shown by U.S. studies highlighting species such as green tea, garlic, echinacea, *Ginkgo biloba*, and ginseng (Abebe et al. 2011).

In terms of information-seeking behavior, responses were almost evenly divided between those who actively searched information about medicinal plants (51.2%) and those who did not (48.8%). This balance suggests a growing but not yet universal public interest in the scientific validation of phytotherapy. When asked about their primary concerns when choosing herbal products, respondents prioritized efficacy first, followed by safety, then cost, while availability was the least concerning factor, indicating that these products are generally easy to access.

An open-ended question invited respondents to suggest ways to improve the quality and effectiveness of phytotherapeutic products. The most frequent recommendations included ensuring the purity of natural ingredients, conducting rigorous clinical studies, and providing professional guidance from physicians, pharmacists, or other health specialists. Concerns about ingredient authenticity and contamination are well-founded. Quality control is a recognized challenge in herbal medicine: inconsistencies in sourcing, processing, and misidentification of herbs can compromise both safety and therapeutic efficacy (Janakiram et al. 2020; Kim 2021; Wang et al. 2023). Other suggestions focused on improving the taste, formulation, and accessibility of products, highlighting user experience as an important factor in acceptance. Respondents also expressed preferences for diversification of herbal oral care products, citing interest in toothpastes, mouth rinses, gingival gels or ointments, breath sprays, whitening products, essential oils, and herbal gums or lozenges. This openness indicates strong consumer demand for a broader range of natural oral healthcare options.

While the present findings offer valuable insight into the perception and acceptance of herbal products for oral health, several limitations must be acknowledged. There is a demographic imbalance with a high number of female respondents and an overrepresentation of young adults. This difference in gender and age distribution limits the generalizability of the results to the broader population, especially older adults and male users, whose perceptions and behaviors may differ. Another limitation of the study is that it was not formally validated prior to distribution. Further research should aim to develop and validate a standardized instrument that could be applied across different populations and cultural settings.

Conclusions

This study highlights the generally positive perception of the general population regarding the use of natural products for oral health. A large proportion of respondents reported using or being willing to use herbal remedies, particularly for common conditions such as aphthous ulcers, gingival bleeding, and halitosis. Phytotherapy was perceived as effective and safe, with very few adverse effects reported, supporting its role as a complementary approach in oral healthcare. Trust in healthcare professionals, especially pharmacists, was identified as the most influential factor in guiding the decision to adopt herbal treatments, underscoring the importance of professional counseling in ensuring the safe and appropriate use of these products. Despite the positive attitudes, a significant proportion of respondents expressed uncertainty, reflecting gaps in knowledge and the need for more reliable information. This finding aligns with international evidence stressing the necessity of standardized formulations, clinical validation, and a clear evaluation of benefits and risks. In conclusion, natural products can be considered as a supportive strategy for maintaining oral health, particularly in mild and preventive contexts. Future efforts should focus on strengthening public education, integrating evidence-based herbal approaches into dental and pharmaceutical counseling, and promoting rigorous research to validate the efficacy and safety of commonly used plant-derived products.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Acknowledgments

This research was funded by George Emil Palade University of Medicine, Pharmacy, Science and Technology of Targu Mures, Romania, Research Grant number 163 /7/ 10.01.2023.

References

1. Abebe W, Herman W, Konzelman J. 2011. Herbal supplement use among adult dental patients in a USA dental school clinic: prevalence, patient demographics, and clinical implications. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 111(3):320–325. https://doi.org/10.1016/j.tripleo.2010.10.012
2. Alhindi N, Sindi A, Binmadi N, Elias W. 2019. A retrospective study of oral and maxillofacial pathology lesions diagnosed at the Faculty of Dentistry, King Abdulaziz University. CCIDE. Volume 11:45–52. https://doi.org/10.2147/CCIDE.S190092
3. Al-Kubaisi KA, Abdel-Qader DH, Al Mazrouei N, Al-Azayzih A, Beshir SA,

Elnour AA. 2025. Community pharmacists' perception of knowledge, attitudes, and practices toward oral health promotion: A Cross-sectional study on the influence of training, demographics, and resources in the UAE.Wilkinson J, editor. PLoS One. 20(6):e0323193. https://doi.org/10.1371/journal.pone.0323193

4. Armfield J, Ketting M, Chrisopoulos S, Baker S. 2017. Do people trust dentists? Development of the Dentist Trust Scale. Australian Dental Journal. 62(3):355–362. https://doi.org/10.1111/adj.12514
5. Chandra Shekar B, Nagarajappa R, Suma S, Thakur R. 2015. Herbal extracts in oral health care - A review of the current scenario and its future needs. Phcog Rev. 9(18):87. https://doi.org/10.4103/0973-7847.162101
6. Chang ZG, Kennedy DT, Holdford DA, Small RE. 2000. Pharmacists' Knowledge and Attitudes toward Herbal Medicine. Ann Pharmacother. 34(6):710–715. https://doi.org/10.1345/aph.19263
7. Chatzopoulos GS, Karakostas P, Kavakloglou S, Assimopoulou A, Barmpalexis P, Tsalikis L. 2022. Clinical Effectiveness of Herbal Oral Care Products in Periodontitis Patients: A Systematic Review. IJERPH. 19(16):10061. https://doi.org/10.3390/ijerph191610061
8. Consolini A, Ragone M. 2010. Patterns of Self-Medication with Medicinal Plants and Related Adverse Events - A South American Survey. CDS. 5(4):333–341. https://doi.org/10.2174/157488610792246019
9. Dabholkar CS. 2016. Comparative Evaluation of Antimicrobial Activity of Pomegranate-Containing Mouthwash Against Oral-Biofilm Forming Organisms: An Invitro Microbial Study. JCDR [Internet]. [accessed 2025 Sep 10]. https://doi.org/10.7860/JCDR/2016/16478.7475
10. Di Stefano M, Polizzi A, Santonocito S, Romano A, Lombardi T, Isola G. 2022. Impact of Oral Microbiome in Periodontal Health and Periodontitis: A Critical Review on Prevention and Treatment. Int J Mol Sci. 23(9):5142. https://doi.org/10.3390/ijms23095142
11. Fainzang S. 2014. Managing Medicinal Risks in Self-Medication. Drug Saf. 37(5):333–342. https://doi.org/10.1007/s40264-014-0153-z
12. Fasinu PS, Bouic PJ, Rosenkranz B. 2012. An Overview of the Evidence and Mechanisms of Herb–Drug Interactions. Front Pharmacol [Internet]. [accessed 2025 Sep 10] 3. https://doi.org/10.3389/fphar.2012.00069
13. Haro-González JN, Castillo-Herrera GA, Martínez-Velázquez M, Espinosa-Andrews H. 2021. Clove Essential Oil (*Syzygium aromaticum* L. Myrtaceae): Extraction, Chemical Composition, Food Applications, and Essential Bioactivity for Human Health. Molecules. 26(21):6387. https://doi.org/10.3390/molecules26216387
14. Hu Z, Yang X, Ho PCL, Chan SY, Heng PWS, Chan E, Duan W, Koh HL, Zhou S. 2005. Herb-Drug Interactions: A Literature Review. Drugs. 65(9):1239–1282. https://doi.org/10.2165/00003495-200565090-00005
15. Hussain SH. 1999. Potential risks of health supplements – self - medication practices and the need for public health education. International Journal of Risk & Safety in Medicine. 12(3–4):167–171. https://doi.org/10.3233/JRS-1999-190
16. Izzo AA. 2005. Herb–drug interactions: an overview of the clinical evidence. Fundamemntal Clinical Pharma. 19(1):1–16.

https://doi.org/10.1111/j.1472-8206.2004.00301.x

17. Janakiram C, Venkitachalam R, Fontelo P, Iafolla TJ, Dye BA. 2020. Effectiveness of herbal oral care products in reducing dental plaque & gingivitis – a systematic review and meta-analysis. BMC Complement Med Ther. 20(1):43. https://doi.org/10.1186/s12906-020-2812-1
18. Kavanaugh NL, Ribbeck K. 2012. Selected Antimicrobial Essential Oils Eradicate *Pseudomonas* spp. and *Staphylococcus aureus* Biofilms. Appl Environ Microbiol. 78(11):4057–4061. https://doi.org/10.1128/AEM.07499-11
19. Kerekes EB, Vidács A, Takó M, Petkovits T, Vágvölgyi C, Horváth G, Balázs VL, Krisch J. 2019. Anti-Biofilm Effect of Selected Essential Oils and Main Components on Mono- and Polymicrobic Bacterial Cultures. Microorganisms. 7(9):345. https://doi.org/10.3390/microorganisms7090345
20. Kim N-C. 2021. Need for Pharmacopeial Quality Standards for Botanical Dietary Supplements and Herbal Medicines. Food Suppl Biomater Health. 1(1):e10. https://doi.org/10.52361/fsbh.2021.1.e10
21. Kováč J, Slobodníková L, Trajčíková E, Rendeková K, Mučaji P, Sychrová A, Bittner Fialová S. 2022. Therapeutic Potential of Flavonoids and Tannins in Management of Oral Infectious Diseases—A Review. Molecules. 28(1):158. https://doi.org/10.3390/molecules28010158
22. Kręgielczak A, Łukaszewska-Kuska M, Mania-Końsko A, Dorocka-Bobkowska B. 2023. Flaxseed (*Linum usitatissimum*), Chamomile (Matricariae flos) and Marshmallow (*Althaea officinalis*) Mouth Rinses in the Therapy of Oral Mucosa Diseases – A Review. Journal of Natural Fibers. 20(2):2228487. https://doi.org/10.1080/15440478.2023.2228487
23. Marchese A, Orhan IE, Daglia M, Barbieri R, Di Lorenzo A, Nabavi SF, Gortzi O, Izadi M, Nabavi SM. 2016. Antibacterial and antifungal activities of thymol: A brief review of the literature. Food Chemistry. 210:402–414. https://doi.org/10.1016/j.foodchem.2016.04.111
24. Miranda-Rius J, Brunet-Llobet L, Lahor-Soler E, Farré M. 2015. Salivary Secretory Disorders, Inducing Drugs, and Clinical Management. Int J Med Sci. 12(10):811–824. https://doi.org/10.7150/ijms.12912
25. Ployon S, Morzel M, Belloir C, Bonnotte A, Bourillot E, Briand L, Lesniewska E, Lherminier J, Aybeke E, Canon F. 2018. Mechanisms of astringency: Structural alteration of the oral mucosal pellicle by dietary tannins and protective effect of bPRPs. Food Chemistry. 253:79–87. https://doi.org/10.1016/j.foodchem.2018.01.141
26. Rusu A, Chereches MC, Popa C, Botezatu R, Lungu I-A, Moldovan O-L. 2022. Community pharmacist's perspective regarding patient-centred communication in conjunction with pharmaceutical practice: A cross-sectional survey. Saudi Pharmaceutical Journal. 30(9):1327–1344. https://doi.org/10.1016/j.jsps.2022.06.014
27. Shinkai RSA, Azevedo CL, De Campos TT, Michel-Crosato E, Biazevic MGH. 2024. Importance of phytotherapy for oral health care and quality of life in adults: A scoping review. Journal of Dental Sciences. 19(2):751–761. https://doi.org/10.1016/j.jds.2024.01.002
28. Song Y, Luzzi L, Brennan DS. 2020. Trust in dentist - patient relationships: mapping the relevant concepts. European J Oral Sciences. 128(2):110–119.

https://doi.org/10.1111/eos.12686
29. Ștefănescu R, Ciurea CN, Mare AD, Man A, Nisca A, Nicolescu A, Mocan A, Babotă M, Coman N-A, Tanase C. 2022. *Quercus robur* Older Bark—A Source of Polyphenolic Extracts with Biological Activities. Applied Sciences. 12(22):11738. https://doi.org/10.3390/app122211738
30. Venkateswara B, Sirisha K, Chava V. 2011. Green tea extract for periodontal health. J Indian Soc Periodontol. 15(1):18. https://doi.org/10.4103/0972-124X.82258
31. Vieira Colombo AP, Magalhães CB, Hartenbach FARR, Martins do Souto R, Maciel da Silva-Boghossian C. 2016. Periodontal-disease-associated biofilm: A reservoir for pathogens of medical importance. Microbial Pathogenesis. 94:27–34. https://doi.org/10.1016/j.micpath.2015.09.009
32. Wang H, Chen Y, Wang L, Liu Q, Yang S, Wang C. 2023. Advancing herbal medicine: enhancing product quality and safety through robust quality control practices. Front Pharmacol. 14:1265178. https://doi.org/10.3389/fphar.2023.1265178
33. Zimmer J, Garbin RR, Vogel MT, Rigo L. 2024. Prevalence of Oral Lesions Diagnosed at a Pathology Institute: A Four-year Analysis. Pesqui Bras Odontopediatria Clín Integr. 24:e230037. https://doi.org/10.1590/pboci.2024.004