

# An Exploratory Insight into Public's Perception and Preference of Mouthwash during COVID-19 Pandemic

Savitha Satish<sup>1</sup>, Sushma Rudraswamy<sup>2,\*</sup>, Jai Shankar Puttabuddi Hommerhalli<sup>3</sup>,  
Nagabhushana Doggalli<sup>3</sup>, Sunitha S.<sup>2</sup>, Sowmya Srinivas<sup>4</sup>

<sup>1</sup>Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, USA

<sup>2</sup>Department of Public Health Dentistry, J.S.S. Dental College and Hospital, J.S.S. Academy of Higher Education and Research, Mysore, India

<sup>3</sup>Department of Oral Medicine and Radiology, J.S.S. Dental College and Hospital, J.S.S. Academy of Higher Education and Research, Mysore, India

<sup>4</sup>Department of Prosthodontics, Crown and Bridge, J.S.S. Dental College and Hospital, J.S.S. Academy of Higher Education and Research, Mysore, India

Received March 1, 2022; Revised August 5, 2022; Accepted August 20, 2022

## Cite This Paper in the Following Citation Styles

(a): [1] Savitha Satish, Sushma Rudraswamy, Jai Shankar Puttabuddi Hommerhalli, Nagabhushana Doggalli, Sunitha S., Sowmya Srinivas, "An Exploratory Insight into Public's Perception and Preference of Mouthwash during COVID-19 Pandemic," *Universal Journal of Public Health*, Vol. 10, No. 6, pp. 569 - 575, 2022. DOI: 10.13189/ujph.2022.100603.

(b): Savitha Satish, Sushma Rudraswamy, Jai Shankar Puttabuddi Hommerhalli, Nagabhushana Doggalli, Sunitha S., Sowmya Srinivas. (2022). *An Exploratory Insight into Public's Perception and Preference of Mouthwash during COVID-19 Pandemic*. *Universal Journal of Public Health*, 10(6), 569 - 575. DOI: 10.13189/ujph.2022.100603.

Copyright©2022 by authors, all rights reserved. Authors agree that this article remains permanently open access under the terms of the Creative Commons Attribution License 4.0 International License

**Abstract** This study aims to evaluate, through a questionnaire, general public awareness preference regarding mouth wash and their perceptions of the importance of self-care to control the disease. Methods: General public completed a 20-item questionnaire that aimed to assess the following: their profile, knowledge, and awareness of the mouthwash, preferences on mouthwashes in terms of their constituent ingredients, short- and long-term side effects, and their attitude towards the use of mouthwashes as plaque control agents. Data tabulation and the frequency distribution using tables and graphics were done. Results: The data showed that 134 participants answered the google form, out of which 56% of participants did not use mouthwash, and 64% gave reasons why it was unnecessary to do so. While another 14.7% were unaware that mouthwash is an adjunct in aiding oral hygiene, and 15% of participants said they did not have enough time to use it. The remaining justifications included difficulty in mouth washing and finding it costly. Conclusion: We conclude with this questionnaire-based survey during the pandemic COVID-19 regarding the public perception and preference of mouth wash, the

general public becomes motivated to promote self-care when the dentist promotes proper instruction. The present study throws light on the fact that widespread usages of herbal products now need to be advocated and prescribed. Hence more evidence pertaining to the usage of herbal product needs to be done with a greater number of clinical and randomized control trials on a larger scale to continue their development and usage at grassroots level.

**Keywords** Plaque Control, Mouthwash, Public, Perception

## 1. Introduction

The primary way of preventing oral diseases is plaque control. Though mechanical plaque removal is the most effective way, several studies have recommended using mouthwashes as an adjunct to mechanical therapy to control plaque [1-5]. Mouthwashes are liquids that have anti-inflammatory, antimicrobial, and anesthetic action.

They are used for reducing oral bacteria and for decreasing oral malodors. They also act as a substitute for saliva by neutralizing and keeping the mouth moist. Mechanical removal and dental plaque control are not enough; mouthwash is suggested for chemical plaque control. There are two types of mouthwash - chemical and herbal.

Chlorhexidine mouthwash is the gold standard mouthwash, an excellent example of a chemical mouthwash prescribed by most oral health care professionals [6]. Nausea, vomiting, feeling like drunken, etc., are symptoms experienced in chlorhexidine overdose, which would occur if the medicine were swallowed. Also, some individuals can develop side effects such as white patches on lips or mouth, ulcers, dry mouth, salivary glands swelling, irritation, unpleasant taste, or reduced sensation caused by an allergic reaction. Using chlorhexidine-containing products over a long period can result in staining teeth, gums, tongue, and restorations made of silicate and resin, altering taste sensation. Hence, they cannot use it for daily prophylactic measures [7,8].

Phytochemical, a natural ingredient in herbal mouthwash, has the desirable effect of anti-inflammatory, antimicrobial and connective tissue rebuilding properties, which can strengthen the healing abilities and improve overall oral health. Herbal mouthwash contains natural herbs which have the property of cleansing and healing teeth and gingiva. It has no alcohol content, artificial flavor, color, or preservatives, making it more popular among its users [9,10].

There are varieties of mouthwash products with lots of different ingredients, whether active or inactive, that oral healthcare professionals can choose. The use of a genre of mouthwash continues to be a debatable argument. It can be daunting to decide the suitability of products for different patients. Increasingly, dental patients are providing medication histories that include herbal medicines. Its use nowadays is in demand because people are more aware of the effects of alternative and complementary medicine [11]. Recommendations of any products by dental professionals to patients are relied upon; its beneficial impact improves their oral health. And also prevent oral infection or diseases without producing any harmful side effects. Nevertheless, in oral health maintenance, patients would prefer cost-effective measures.

Although several studies [12-15] have shown the role of mouthwashes in plaque control, the literature highlighting the public's perception and preferences towards mouthwashes as agents of plaque control is limited. Against this backdrop, this research aims to assess the public's perception of mouthwash and its usage through a cross-sectional questionnaire study.

### 1.1. Objectives

The study's main aim will be to establish the Publics' perception and preferences on mouthwashes in terms of

their constituent ingredients, short- and long-term side effects, and their attitude toward using mouthwashes as plaque control agents.

### 1.2. Implications

The findings from the study

- Identify the gaps in mouthwash usage by the general public in the present-day scenario.
- As an oral health professional, promote cost-effective oral health maintenance measures that have no side effects.
- To spread awareness regarding complementary and alternative medicine for Oral health care that will eventually help improve the general public's knowledge and practices for the healthy oral cavity
- Understanding the public's perception regarding the usage of mouth wash during COVID situation.

## 2. Methodology

### 2.1. Type of Study

This was a cross-sectional questionnaire study conducted through google forms. We obtained Ethical clearance for the study from the JSS Dental College and Hospital Institutional ethics committee, JSS Academy of Higher Education and Research, Mysore, India.

### 2.2. Study Setting and Source of Data

The participants for this Cross-sectional Questionnaire study were the general public of Mysore city and those attending the outpatient department of the JSS Dental Hospital, Mysore, India willing to participate and fill out the google form between August and October 2020.

#### 2.3.1. Inclusion Criteria

- Those who consented to participate and fill out the google form.
- Aged more than 18 years

#### 2.3.2. Exclusion Criteria

- Not willing to participate
- Not used the mouthwash at any time or not aware of mouthwash's existence.

#### 2.3.3. Ethical Considerations

The names of the participants were not sought or recorded, we treated the information in the questionnaires with the utmost confidentiality and all data were reported in group form only. Participation in this research is totally voluntary, and informed consent was obtained after explaining the nature and purpose of the study.

**2.4. Data Collection**

A literature review and discussion with subject experts in the field of oral medicine, pharmacy and general dental practitioners was sought to develop an initial pool of items. Validation of the questionnaire involved content validation by subject experts who shared their inputs on relevance, appropriateness, clarity and suggested modification. Based on information received from subject experts, a pretested questionnaire was developed. Questions on the perception of the patients about the use of the mouth wash, motivating factors for its use, the kind of mouthwashes they prefer, their expectations about it, the benefits they usually want to see in the mouthwashes, and thoughts about herbal mouthwashes were included in the questionnaire.

**2.5. Statistical Analysis**

Data were entered and analyzed using an excel sheet and SPSS version 22(SPSS Inc, Chicago, IL, U.S.A.). The qualitative data is expressed in frequencies and percentages.

**3. Results**

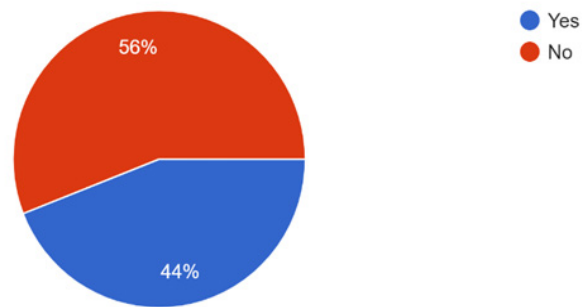
In this questionnaire, there was a set of 20 questions to be answered by the participants. A total of 134 participants responded to the google form, and their responses are presented. First and foremost, when asked whether they had used a mouthwash, among the 134 participants, more than half of them, which is 56% participants, did not use it, while the rest, 44%, did use it (Figure 1). There was a slight difference of 12% between the mouthwash users and non-user.

Out of the 56% of participants who did not practice mouth rinsing from the first question, 64% gave reasons

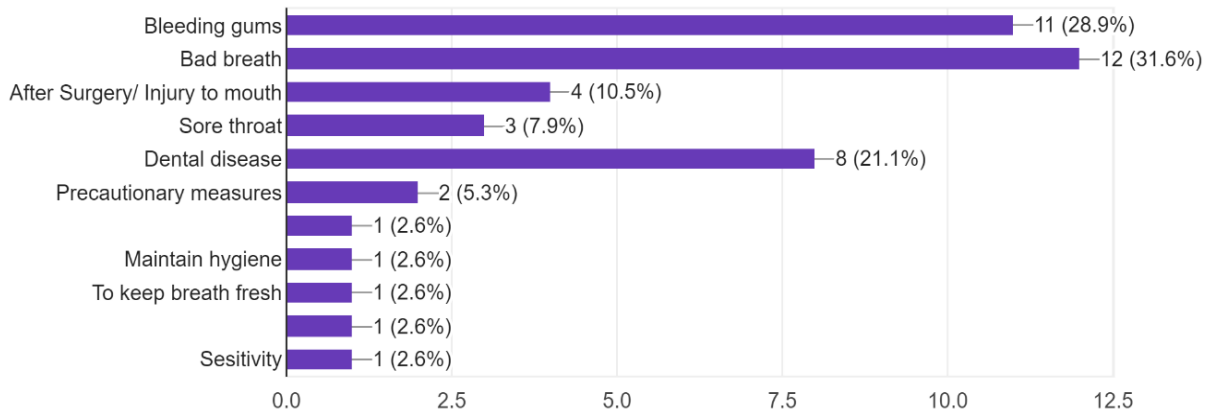
why it was unnecessary to do so. While another 14.7% were unaware that mouthwash is an adjunct in aiding oral hygiene, 15% of participants said they did not have enough time to use it. The remaining had justifications, including difficulty in the mouth washing procedure and finding it costly.

Out of 44% positive responses to the first question, 54.4% admitted that the mouthwash was being prescribed or recommended. When probed further, almost three-quarters of participants revealed that a dentist wrote the prescription, and others by recommendation from a friend, a relative, or a partner. Meanwhile, medical doctors prescribed as little as 2.6% of their mouthwash.

The rationale for the recommendation or prescription was mainly because of halitosis or foul breath, which was 31.6%, followed closely by gingiva bleeding at 28.9%, and oral infection of dental origin at 21.1%. Moreover, some were given after surgery or trauma to relieve sore throat and as prophylaxis measures, while others used mouthwash to maintain oral hygiene, keep their breath fresh, and reduce dentinal hypersensitivity (Figure 2).



**Figure 1.** Public response to mouthwash usage



**Figure 2.** Reason for mouthwash recommendation

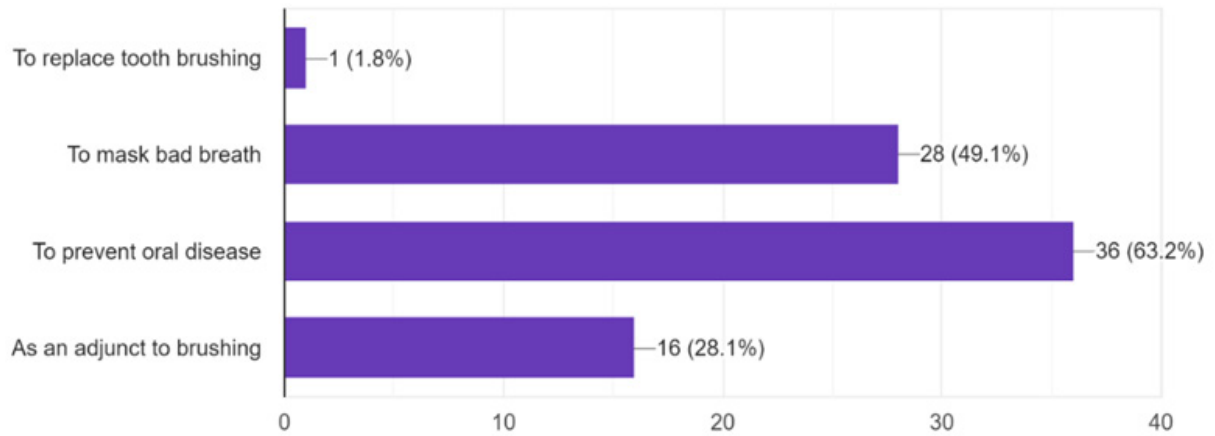


Figure 3. Motives behind the mouthwash usage

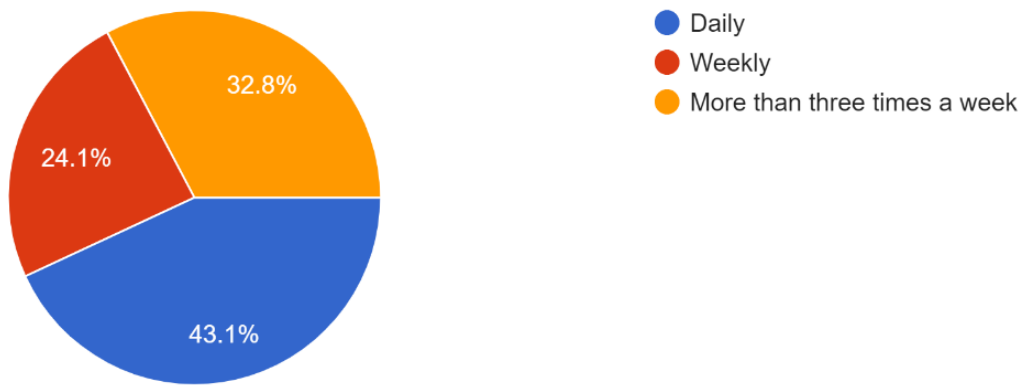


Figure 4. Response for the frequency of mouthwash usage

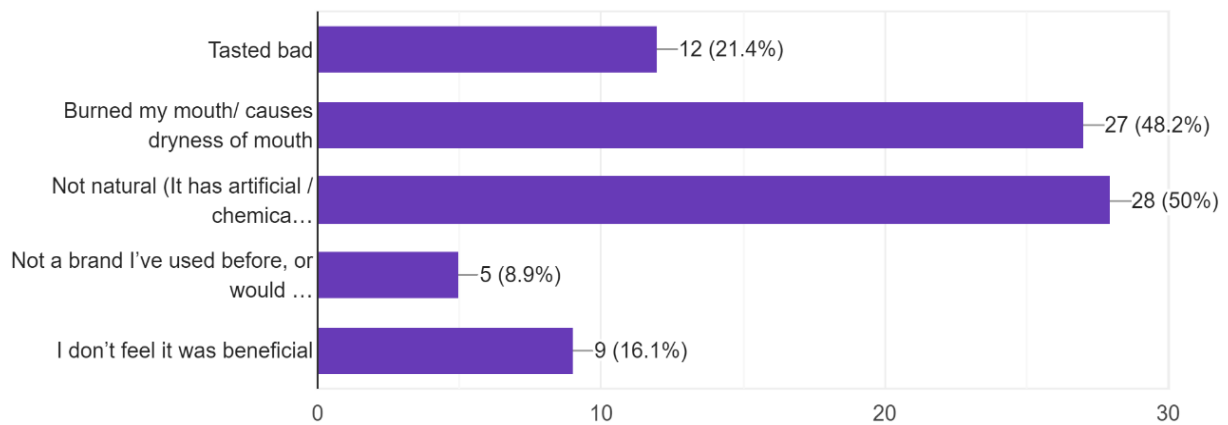


Figure 5. Features of the mouthwash disliked by the participants

Furthermore, 63.2% of mouthwash users determined that the routine can prevent oral disease and as low as 1.8% of them believed that it is an alternative to tooth brushing. Subsequently, almost half of them, which is 49.1%, gargle to conceal lousy breath, and the remaining said that it was to accompany tooth brushing (Figure 3).

In inquiring about the timing of mouth rinsing in a day, 65.5% of participants did it after tooth brushing, with only 3.4% managing to do it before. Besides, 37.9% of those people use it before sleep at night, and the rest use it directly after eating.

In a monthly regime, most participants 43.1% rinse every day, whereas 24.1% do the same once a week, and another 32.8% rinse at the frequency of more than three times per week (Figure 4).

When purchasing mouthwash products, 81% thought of how it would work, such as its functions and features like antibacterial and alcohol content. Others pondered upon the brand reliability, products' flavor, and packaging bottle or appearance.

While investigating dissatisfaction with mouthwash usage, precisely 50% of those who participated gave a history of unnatural or artificial taste of mouthwash in their experience, and 48.2% complained of a burning sensation or mouth dryness. Others did not prefer it if the product's brand was unfamiliar or tasted terrible, and the rest of 16.1% felt it was not worthwhile to use (Figure 5).

To estimate the availability of mouthwash accessible to participants, 47.5% and 40.7% had purchased it in hospitals, pharmacies, and grocery stores, respectively. The remaining were from the dental clinic, drug store, and even homemade salt water.

In searching for ideal specifications of mouthwash products, almost 70% of participants preferred its antibacterial features while 52.5% fancied natural ingredients with zero alcohol content. Approximately 25.4% considered its flavor, while the rest judged the price, availability, and popularity.

Roughly, 31% of these participants confided that mouthwash possesses no active ingredients, and another 69% believed that mouthwash contains a functional element. A more significant number of participants, at 91.5%, knew that the existence of harmful and unharmed microbes resides in the oral cavity, and a lesser number of 8.5% were unaware of this. With a striking difference of 34.4%, most participants were sure that a high concentration of a particular ingredient in mouthwash could destroy the good bacteria in the oral cavity. A little more than 56% of participants believed that rinsing with mouthwash would kill all the bacteria in the oral cavity, while others did not think so.

Regarding volunteering for any mouthwash with no brand name, even if it is ideal for them, almost half of them were willing, while the other half did not agree with as low as a 1.6% difference. Among these participants, 54.4% assured that placement of advertisement through media coverage or by doctor endorsement affects the likelihood

for them to purchase the mouthwash products. On the other hand, 61% of these participants deliberated those herbal mouthwashes bring more benefits than chemical ones, along with 39% who contemplated that the latter is more beneficial than the former. Lastly, almost 56% of the participants were not aware that herbal mouthwash is available to be purchased commercially.

## 4. Discussion

This cross-sectional questionnaire study aimed to gain insight into public perception, attitude, and preferences on mouthwash products as a plaque control agent based on its integral ingredients and side effects from short- and long-term use.

In the present study more than half of participants did not use mouthwash and believed that it is unnecessary. Macfarlane T.V. et al. 2010, defined mouthwash users as using daily or once every few days and non-users as less than once per month or never[16]. This study proved that there is still public awareness regarding the benefits of mouthwash rinsing, such as reducing plaque, periodontal and gum disease, eliminating halitosis, preventing tooth decay, and many more[17]. Even during the COVID-19 situation, where the media is educating the public regarding hand hygiene and maintenance of personal hygiene, the public is not giving importance to oral hygiene.

Another excuse is that it is difficult to use, while in contrast, the act of mouth rinsing is convenient and easy and does not pose any manual dexterity challenge[17].

Most participants who use mouthwash are from recommendations, probably because chlorhexidine-containing products are available only by doctor prescription, which restricts patient accessibility[5]. This study further demonstrates that explanation from dental professionals is crucial to establishing rapport with patients and motivation for oral hygiene maintenance. The instructions must be in plain and comprehensible language appropriate to the patient's age and cultural level[18].

Similar to a study by Mitha S[17], common reasons to recommend or use mouthwash products are to mask bad breath, treat periodontal problems, and prevent dental diseases. Besides, another study by Phillips TR proved that gargling mouthwash provides better coverage to the oropharynx than rinsing, thus effectively inhibiting *Neisseria gonorrhoeae* growth[20]. Other users are seemingly forced to use it for treatment after minor oral procedures, sore throat, and dentinal sensitivity. The fact is that there is a variety of newer herbal mouthwashes available nowadays. However, they are heterogeneous, and more scientific studies are required to prove its effectiveness or whether it is up to par with 'gold standard' chlorhexidine for future use and recommendation[21]. Still, mouthwash is only marked as an adjunct procedure to tooth brushing in controlling plaque[22].

The frequency of mouthwash used after tooth brushing is significantly higher than the few who prefer it. The same goes in another study in which almost 90% use mouthwash before brushing their teeth. Likewise, a more significant number would use it every day, and the least number would use it twice or thrice a week, presumably because of lacking time to fit into everyday practice[17].

Among participants' experience with mouthwash use, they are sensitive to chemical taste and disliked dryness of the mouth or burning sensation. In addition, the vast majority are aware of active ingredients in mouthwash and, if added in high concentration, can destroy good bacteria in the oral cavity. Although tooth staining is most frequently reported with chlorhexidine mouthwash, the difference in its concentration did not alter its staining intensity. If an anti-discoloration system is added, it can effectively reduce stains on teeth without compromising its anti-gingivitis property[19]. Other less reported adverse effects include taste alteration or disturbances, aphthous ulcers, tongue lesion and discoloration, glossodynia, oral paresthesia, and gastrointestinal symptoms[19].

When purchasing mouthwash products, 81% thought of functionality and features, for example, antibacterial and antiplaque properties, as the most crucial consideration. Few people dwell on a brand name, popularity, taste or flavor, price, and looks of packaging bottles. This study suggested that products should display a detailed description of their active ingredients on the packaging instead of beguiling on esthetic route for promotion. Second, most people deliberated on all-natural or no alcohol content due to this linked to oral cancer. On the contrary, some evidence shows that mouthwash use does not increase oral cancer risk[5]. The likelihood of them buying also increase if products are endorsed by health care professionals or advertisement made through media, which indicate that coverage of healthcare concern on such platform is deemed reliable from the public point of view. Places to obtain these products are also recorded; hospital pharmacies and supermarkets are the two highest, followed by the dental clinic, pharmacy, and at home as salt water, with 18.6% of participants checked for product availability.

Furthermore, most people are informed that there are bacteria residing in the mouth labeled as good or bad, and more than half believe mouth rinsing practice can destroy all bacteria inside the mouth. Chemical agents in mouthwash modify microbes by eliminating pathogens overgrowth selectively without harming flora normal to the oral cavity[5].

Last, many are convinced that herbal mouthwash brings more benefits than chemical type. Unfortunately, few are aware that these herbal mouthwashes are commercially available. They have to be promoted and known for their advantages compared to other products.

## 5. Conclusions

A questionnaire-based survey during pandemic COVID-19 regarding the public perception and preference of mouth wash of 134 public participated in the study. The results showed that 55% of participants did not use mouth wash, 45% of people did use it, and about 54% of mouth washes were prescribed and instructed to use by the dentist. Most of them are used for halitosis and not for gingival bleeding, and most are used daily once after tooth brushing. Another interesting fact is that the reason was dissatisfaction in mouth wash usage due to dryness and sour taste. Regarding chemical versus herbal mouthwash, 61% judged herbal is more beneficial than chemical, and 56% were unaware of herbal mouthwash. With this, we need to strengthen the commercial availability of herbal mouth wash and its beneficial effects so that the grassroots locals can take the initiative and research this.

---

## REFERENCES

- [1] Gunsolley, J.C., "Clinical efficacy of antimicrobial mouth rinses," *Journal of Dentistry*, vol. 38, no. 1, pp. 6-10, 2010. DOI: 10.1016/S0300-5712(10)70004-X
- [2] DePaola LG, Spolarich AE. "Safety and Efficacy of Antimicrobial Mouth rinses in Clinical Practice", *J Dent Hyg*, vol. 81, no. 5, pp.13–25, 2007.
- [3] Freires, I.A., Silva, I.C.G. Alves, I.A.; Bezerra, L.M.D, Castro. "Clinical applicability of natural product(s)-containing mouthwashes as adjunctive treatment of biofilm-induced gingivitis: a systematic review". *Rev. Bras. Pl. Med., Botucatu*, vol. 14, no. 4, pp. 700-711, 2012. DOI: 10.1590/S1516-05722012000400019
- [4] Barnett ML. "The rationale for the daily use of an antimicrobial mouth rinse". *J Am Dent Assoc*, 137(Suppl) pp. 16S–21S, 2006. DOI: 10.14219/Jada.archive.2006.0408
- [5] Diane Osso Nehal Kanani, "Antiseptic Mouth Rinses: An Update on Comparative Effectiveness, Risks and Recommendations". *The Journal of Dental Hygiene*, vol. 87, no. 1, 2013. PMID: 23433693

- [6] Renuka and Muralidharan. "Comparison in benefits of herbal mouthwashes with chlorhexidine mouthwash: a review", *Asian J Pharm Clin Res*, vol. 10, no. 2, pp 3-7, 2017. DOI: <https://doi.org/10.22159/ajpcr.2017.v10i2.13304>
- [7] Gupta D, Nayan S, Tippanawar HK, Patil GI, Jain A, Momin RK, Gupta RK. "Are herbal mouthwash efficacious over chlorhexidine on the dental plaque?" *Pharmacognosy Res*, vol. 7, no. 3, pp. 277-81, 2015. DOI: 10.4103/0974-8490.155874
- [8] Biswas G, Anup N, Acharya S, Kumawat H, Vishnani P, Tambi S. "Evaluation of the efficacy of 0.2% chlorhexidine versus herbal oral rinse on plaque-induced gingivitis - A randomized clinical trial" *IOSR J Nurs Health Sci*, vol. 3, no. 2, pp. 58-63, 2014.
- [9] Aspalli S, Shetty VS, Devarathnamma MV, Nagappa G, Archana D, Parab P "Evaluation of antiplaque and antigingivitis effect of herbal mouthwash in treatment of plaque-induced gingivitis: A randomized, clinical trial". *J Indian Soc Periodontol*, vol. 18, no. 1, pp. 48-52, 2014. DOI: 10.4103/0972-124X.128208
- [10] Jhakukreja B, Dodwad V. "Herbal mouthwashes – A gift of nature." *Int J Pharm Bio Sci*; vol. 3, no. 2, pp. 46-52, 2012.
- [11] Sunayana M, Sajjid H, Umesh W, Prabu D, Ravi K, "The Mouthwash War - Chlorhexidine vs. Herbal Mouth Rinses: A Meta-Analysis." *Journal of Clinical and Diagnostic Research*, vol. 10, no. 5, pp. ZC81-ZC83, 2016. DOI 10.7860/JCDR/2016/16578.7815
- [12] Barnett ML. "The role of therapeutic antimicrobial mouth rinses in clinical practice: control of supragingival plaque and gingivitis" *J Am Dent Assoc*, vol. 134, no. 6, pp. 699-704, 2003. DOI: 10.14219/Jada.archive.2003.0255.
- [13] Prasad KA, John S, Deepika V, Dwijendra KS, Reddy BR, Chincholi S. "Antiplaque efficacy of herbal and 0.2% chlorhexidine gluconate mouthwash: A comparative study", *J Int Oral Health*, vol. 7, no. 8, pp. 98-102, 2015. PMID: 26464549.
- [14] Vasconcelos LC, Sampaio FC, Sampaio MC, Pereira Mdo S, Higino JS, Peixoto MH. The minimum inhibitory concentration of adherence of *Punica granatum* Linn (pomegranate) gel against *S. mutans*, *S. mitis* and *C. Albicans*. *Braz Dent J*, vol. 17, no. 3, pp. 223-7, 2006.
- [15] Mittal P, Gupta V, Kaur G, Garg AK, Singh A. Phytochemistry and pharmacological activities of *Psidium guajava*: A review. *Int J Pharm Sci Res* vol. 1, no. 9, pp. 9-19, 2010.
- [16] Macfarlane TV, Kawecki MM, Cunningham C, Bovaird I, Morgan R, Rhodes K, Watkins R. "Mouthwash Use in General Population: Results from Adult Dental Health Survey in Grampian, Scotland," *J Oral Maxillofac Res*, vol. 1, no. 4, 2010. DOI: 10.5037/jomr.2010.1402
- [17] Mitha S, Elnaem M, Koh M, En C, Babar M, Siddiqui J, Jamshed S. Use and Perceived Benefits of Mouthwash among Malaysian Adults: An Exploratory Insight. *J Adv Oral Res*, vol. 7, no. 3, pp. 7-14, 2016. DOI 10.1177/2229411220160302.
- [18] Garcia A, Clavijo E M A, Flório FM, Okajima LS, Fonseca Silva Ade S, "Perception assessment of periodontal patients regarding their self-care", *Rev Gaúch Odontol*, Porto Alegre, vol. 62, no. 2, pp. 153-158, 2016. DOI: 10.1590/1981-8637201400020000081192
- [19] Gianluca M. Tartaglia, Santosh Kumar Tadakamadla, Stephen Thaddeus Connelly, Chiarella Sforza, and Conchita Martin, "Adverse events associated with home use of mouth rinses: a systematic review," *Therapeutic Advances in Drug Safety*, vol. 10, pp. 1–16, 2019. DOI: 10.1177/2042098619854881
- [20] Phillips TR, Fairley C, Maddaford K, Trump our S, Wigan R, Bradshaw C, Hocking SJ, Chow E.P.F. "Duration of gargling and rinsing among frequent mouthwash users: a cross-sectional study," *B.M.J. Open*, vol. 10, no. e040754. 2020. DOI: 10.1136/ BMJ open-2020-040754.
- [21] Sunayana Manipal, Sajjid Hussain, Umesh Wadgave, Prabu Duraiswamy, K. Ravi, The Mouthwash War - Chlorhexidine vs. Herbal Mouth Rinses: A Meta-Analysis, *Journal of Clinical and Diagnostic Research. Dentistry Section*, 2016 May, Vol-10(5): ZC81-ZC83
- [22] Guimaraes, Duarte AR, Peres, Aurélio M, de Sousa R, Melin FR, Jorge R, Leticia M, Apolinario, Anderson SD "Self-Perception of Side Effects by Adolescents in A Chlorhexidine-Fluoride-Based Preventive Oral Health Program", *Journal of Applied Oral Science, J Appl Oral Sci*, vol.14, no. 4, pp. 291-6, 2006. DOI: 10.1590/S1678-77572006000400015.