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RESEARCH ARTICLE

Effectiveness of Mouth Pulling with Guava Leaves Powder on Gingivitis Among Adults.

Ms Rajnandini Mhetar[1], Ms Jesica Mali[2], Mrs shilpa satralkar[3], Mr Nikhil Jadhav[4] and Mr Shardul Jadhav[5]
[1]M Sc Nursing scholar, Bharati Vidyapeeth (Deemed to be University) College of Nursing, Sangli.
[2,4,5]Clinical Instructor, Bharati Vidyapeeth (Deemed to be University) College of Nursing, Sangli.
[3]Assistant Professor, Bharati Vidyapeeth (Deemed to be University) College of Nursing, Sangli.

*Corresponding Author
Ms Rajnandini Mhetar

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Abstract: Gingivitis, a mild yet common gum inflammation characterized by redness, swelling, and bleeding, can progress to periodontal disease if untreated. Psidium guajava (guava) leaves, rich in tannins, flavonoids, and saponins, possess anti-inflammatory, antimicrobial, and analgesic properties. This study investigates guava leaf powder as a natural, cost-effective alternative to chemical mouthwashes, particularly in resource-limited settings.A quasi-experimental, pre-test post-test control group design was adopted. Seventy adults diagnosed with gingivitis were randomly assigned to experimental and control groups. The experimental group performed mouth pulling with guava leaf powder for eight days; the control group received no intervention. Gingival Index (GI) scores were recorded on Day 1 and Day 8.The experimental group showed a significant reduction in GI scores from 1.6857 to 0.1714, while the control group decreased from 1.5142 to 0.4571. Statistical analysis confirmed a notable difference post-intervention, validating the efficacy of guava leaf powder. Guava leaf powder mouth pulling significantly reduces gingival inflammation and improves oral hygiene.

Keywords: Guava leaves powder, Guava leaves powder solution, Gingivitis, Gingival Index.

INTRODUCTION

The gingiva is the part of the oral mucosa that covers the alveolar processes of the jaws and surrounds the neck of the teeth. The gingiva is divided anatomically into the marginal, attached, and interdental gingiva. The marginal gingiva forms the soft tissue wall around the teeth. The attached gingiva is firmly bound to the underlying bone. The interdental gingiva occupies the spaces between teeth. The gingival fluid contains components of connective tissue, epithelium, inflammatory cells, serum and microbial flora inhabiting the gingival margin or the sulcus. The gingival fluid is believed to 1) cleanse material from the sulcus. 2) It contains plasma proteins that may improve adhesion of the epithelium to the tooth, 3) possess antimicrobial properties, and 4) exert antibody activity to defend the gingiva.

A prevalent and gentle form of gum inflammation called 'Gingivitis' affect a large portion of the global population. Gingivitis typically develops due to a bacterial infection caused by plaque overgrowth. Other viral or fungal infection may also cause it. In reality, our gums adhere to our teeth at a lower place than the apparent gum boundaries. This develops a sulcus, which is a little area. Gingivitis, or a gum infection, may arise from food and plaque accumulating in this area [1]. A thin layer of germs is called 'Plaque.' Plaque is the primary contributor to periodontal disease [2.] On the surface of teeth, it forms continually. Plaque solidifies and transforms into tartar as it progresses. The main cause of gum inflammation, involving redness, swelling, and bleeding, particularly after brushing [3]. gingivitis can worsen and develop into more serious conditions that lead to tooth loss if periodontal decay is not treated.

An approach to using toothpaste and mouthwash formulations that contain effective antimicrobial agents is one way to improve oral hygiene. Clinical studies related to the removal of plaque and remission of gingivitis had been accepted as support for the definite relationship between plaque and gingivitis and for the belief that it is a significant factor in the maintenance of gingival health [4]. Given that the majority of synthetic and chemical medications used as root canal antimicrobials. Since disinfection has a harmful effect on human cell, the use of herbal medicinal extract has become more and more popular recently because of their naturalness and biocompatibility [5]. Now days, Traditional Medicines are growing in popularity, most likely as a result of family influence, cultural familiarity, affordability, and availability. This search for solace in traditional or indigenous medicines, where herbal preparations make up a significant portion, may also have been influenced by public awareness of the negative effect of overprescribing and abusing western medications [6]. Considering the extensive use of plants in herbal medicines, various strategies are currently underway to identify novel bioactive compounds [7].

Psidium guajava L., commonly referred to as guava, is a small tree that is a component of the myrtle family (Myrtaceae) [8]. In India, the traditional way of managing many kinds of illnesses, which includes rheumatism, diarrhea, diabetes mellitus, and cough, is to consume decoction, infusion, and boiled preparations of guava leaves [9]. The majority of P. guajava phytochemical examinations demonstrated the presence of bioactive molecules such as tannins, triterpenes flavonoids, essential and alkaloids, glycosides, lectins, carotenoids, fixed oils, saponins, vitamins (C & A), and reducing sugars [10]-[11]. Guava has demonstrated

antimicrobial, antiparasitic, antitussive, hepatoprotective, antioxidant, antigenotoxic, antimutagenic, antiallergic, anticancer and antidiarrheal properties, as well as effect that prevent hyperglycemia [12].

Due to its beneficial effects on local tissues, guava leaf extract has been used to treat aphthous ulcers, showing significant improvement in pain relief and ulcer resolution within seven days [13]. Additionally, guava leaves have been reported to contribute to dental hygiene maintenance [14]-[15].

Regarding the global prevalence of gingivitis, periodontal diseases-including gingivitis-affect approximately 1.07 billion people worldwide. Severe periodontal disease impact nearly 1 billion individuals, highlighting the widespread nature of oral health concerns. In India, gingivitis affects approximately 46.6% of adults. Periodontal diseases, including gingivitis and periodontitis, are prevalent among the population, with 51% of Indian adults experiencing some form of periodontal disease. The prevalence of mild to moderate periodontitis is 26.2%, while severe periodontitis affects 19% of adults [16].

MATERIAL AND METHODS

This quasi-experimental study adopted a quantitative research approach to evaluate the effectiveness of mouth pulling with guava leaves powder in alleviating symptoms of gingivitis among adults. The investigation was conducted across selected Dental Outpatient Departments within the Sangli-Miraj-Kupwad Corporation area. A total of 70 adult participants clinically diagnosed with gingivitis were selected using a simple random sampling technique and equally divided into two groups: an experimental group and a control group. The experimental group performed mouth pulling with guava leaves powder once daily for eight consecutive days, whereas the control group received no intervention during the same period. Gingivitis was assessed using the standardized Gingival Index (GI) before the intervention on Day 1 and after the intervention on Day 8 in both groups. Additional demographic information was collected through structured questionnaires. In this study, the guava leaves powder served as the independent variable, while the degree of gingival inflammation was treated as the dependent variable.

Study participants

Participants were assigned to group A (Experimental group) and group B (Control group) using a purposive sampling technique for those individuals was faced with gingivitis problem. Assessment of pre- test level for gingivitis carried out before starting the intervention and at the end of the 8th day, the post-test level of gingivitis was done. In the experimental group, adults received the guava leaves powder solution for 8 days with BD dose for 1 min every time. Follow-up assessments were conducted on the 3rd and 8th day.

Guava Leaves Powder Solution

According to Ayurvedic method of Decoction

- The investigator will first purchase guava leaf powder.
- A 5-gram dose of guava leaf powder will be measured for each participant using a weighing scale, for one-time use.
- Next,80 ml of water will be taken to prepare the solution for mouth pulling.
- The 5 grams of guava leaf powder will be added to the 80 ml of water, and the mixture will be heated until the water reduces up to 20 ml.
- After heating, the remaining 20 ml of the solution will be given for mouth pulling to the participant by the investigator.

Intervention

In experimental group.

- Guava leaves powder solution will be given to the participants for seven days.
- The freshly prepared guava leaves powder solution will be administered twice a day, in the morning and evening.
- Before administering the guava leaves powder solution to the participant, the level of gingivitis will be observed and recorded.
- The guava leaves powder solution will be used for mouth pulling for one minute, after which it will be spat out.
- After cleaning the mouth, the gums will be examined within 5 minutes, and the information will be recorded on the same day.
- This procedure will be repeated for 7 consecutive days with the same participant.
- The level of gingivitis will be recorded through a post-test only on the 8th day.
- In the control group, no intervention should be applied, and the records should be maintained accordingly.

Sample Selection Criteria

The participants were selected as per inclusion criteria, i.e. Adults aged 18+ to 60 years old and individuals who were willing to participate. The participants were excluded from the study as per exclusion criteria, i.e. Individuals with severe gingivitis, pregnant women's and persons who have history of allergy towards guava.

Ethical Consideration

The Institutional Ethical Committee Bharati Vidyapeeth (Deemed to be University) College of Nursing (IECBVDUCON, Sangli, Maharashtra, India, EC/NEW/INST/2024/MH/0414) approved the study as "Effectiveness of Mouth Pulling with Guava Leaves Powder on Gingivitis among the Adults."

Statistical Analysis

For data analysis, IBM SPSS Statistics 26.0 was used. Descriptive statistics provided insights into the mean and standard deviation for each group. As per the objectives, the paired-t test was used to compare pre-test and post-test results between the experimental and control groups. An unpaired t-test was employed to compare post-test gingivitis levels between the experimental and control groups.

Table 1- Frequency and percentage distribution of demographic variables.

Sr. no.	Demographic variables		Experimental group		Control group	
			Frequency	Percentage (%)	Frequency	Percentage (%)
1.	Age (in yrs.)	18 – 30	5	14.28	9	25.71
		31 – 40	7	20	12	34.29
		41 – 50	12	34.29	5	14.28
		51 – 60	11	31.43	9	25.71
2.	Gender	Male	19	54.29	18	51.43
		Female	16	45.71	17	48.57
3.	Habit	Tobacco chewing	5	14.28	4	11.42
		Smoking	1	2.86	1	2.86
		Alcohol	0	0	1	2.86
		None of the above	29	82.86	29	82.86

In the selected area, the age distribution of adults in both the experimental and control groups revealed distinct patterns. In the experimental group, 34.29% of individuals were in the 41–50 age range, whereas in the control group, 34.29% belonged to the 31–40 age range, indicating differing age compositions between the groups. Regarding gender, 54.29% of adults in the experimental group were male and 45.71% were female, while in the control group, 51.43% were male and 48.57% were female. In terms of personal habits, 82.86% of individuals in both groups reported having no harmful habits. In the experimental group, 14.28% had a habit of chewing tobacco and 2.86% smoked, whereas in the control group, 11.42% chewed tobacco, 2.86% smoked, and another 2.86% consumed alcohol. The frequency and distribution of demographic data are shown in Table 1.

Table 2- Frequency and Percentage Distribution of Gingivitis Levels before to Mouth Pulling with Guava Leaf Powder in Experimental and Control Groups.

Level of gingivitis	**Experimental group**		**Control group**	
	Frequency	Percentage	Frequency	Percentage
0 (Normal gingiva)	0	0	0	0
1 (Mild inflammation)	11	31.43	17	48.57
2 (Moderate inflammation)	24	68.57	18	51.43
3 (Severe inflammation)	0	0	0	0

The pre-intervention assessment of gingivitis levels among adults in the Sangli-Miraj-Kupwad corporation area revealed notable differences between the experimental and control groups. In the experimental group, prior to undergoing mouth pulling with guava leaf powder, 68.57% of participants exhibited moderate gingival inflammation, while 31.43% showed mild inflammation; none presented with normal gingiva or severe inflammation. In contrast, the control group, assessed before receiving medical treatment, showed 51.43% of participants with moderate gingival inflammation and 48.57% with mild inflammation, with no cases of normal gingiva or severe inflammation observed in this group either. Frequency and Percentage Distribution of Gingivitis Levels before to Mouth Pulling with Guava Leaf Powder in Experimental and Control Groups shown in Table 2.

Table 3- Frequency and percentage distribution of level of gingivitis after application of guava leaves powder in experimental and control group.

Level of gingivitis	**Experimental group**		**Control group**	
	Frequency	Percentage	Frequency	Percentage
0 (Normal gingiva)	29	82.86	20	57.14
1 (Mild inflammation)	6	17.14	14	40
2 (Moderate inflammation)	0	0	1	2.86
3 (Severe inflammation)	0	0	0	0

The post-intervention evaluation of gingivitis levels among adults in the Sangli-Miraj-Kupwad corporation area revealed significant improvements in both the experimental and control groups. In the experimental group, where participants underwent mouth pulling with guava leaf powder, 82.86% exhibited normal gingiva and 17.14% showed mild inflammation, with no cases of moderate or severe gingival inflammation observed. In the control group, which received medical treatment, 57.14% of participants had normal gingiva, 40% presented with mild inflammation, and only 2.86% showed moderate inflammation; no severe cases were reported. These findings suggest a notable enhancement in gingival health following both interventions, with the experimental group showing a higher proportion of individuals achieving normal gingiva. Frequency and percentage distribution of level of gingivitis after application of guava leaves powder in experimental and control group shown in Table 3

Table 4- Pre-test and Post-test comparison on the level of gingivitis -Experimental group.

Experimental group	Mean	S.D.	Paired t- test	p -value	Significance
Pre- test	1.6857	0.471	-17.6667	0.00001 < 0.05	Significant
Post- test	0.1714	0.3823			

A paired t-test was conducted to evaluate the effectiveness of the intervention on the level of gingivitis among adults in the selected area of Sangli-Miraj-Kupwad Corporation. The analysis was performed at a 5% level of significance. In the experimental group, the mean gingivitis score before the intervention (pre-test) was 1.6857 with a standard deviation of 0.471, while the post-test mean score significantly decreased to 0.1714 with a standard deviation of 0.3823. The paired t-test yielded a value of -17.6667, and the corresponding p-value was 0.00001, which is well below the threshold of 0.05, indicating a statistically significant reduction in gingivitis levels following the intervention. These findings suggest that the implemented measures were highly effective in improving oral health among the study population. Pre-test and Post-test comparison on the level of gingivitis -Experimental group. It shown in Table 4.

DISCUSSION

This study highlights the effectiveness of guava leaves powder as a natural intervention for gingivitis, particularly among middle-aged adults who may be more susceptible or proactive in seeking oral care. The demographic balance in age and gender, along with a majority of participants reporting no harmful habits, strengthens the reliability of the findings. Clinically, the experimental group showed remarkable improvement, with 82.86% achieving normal gingiva post-treatment, compared to 57.14% in the control group. No cases of moderate or severe inflammation remained in the experimental group, indicating a strong therapeutic response. Statistical analysis confirmed these outcomes, with a significant drop in gingivitis scores ($p = 0.00001$) and a notable difference between groups ($p = 0.0151$). These results support the superior efficacy of guava leaves powder over conventional treatment and suggest its potential for broader application in preventive oral healthcare, offering a safe, accessible, and effective alternative for managing gingival inflammation.

A similar study, the review by Nivethaprashanthi et al. (2020) examined the effectiveness of herbal versus non-herbal toothpastes in controlling plaque and gingivitis. By analysing randomized controlled trials and clinical studies, researchers compared the impact of both formulations on plaque accumulation and gingivitis severity. The review included five RCTs and four clinical trials, assessing improvements in gingival health over time. Results indicated a significant reduction in plaque and gingival scores among individuals using herbal toothpaste, with findings showing statistically comparable reductions in both toothpaste groups. Additionally, no adverse reactions were reported for herbal formulations, highlighting their safety. The study concluded that herbal toothpastes are as effective as conventional options for maintaining oral health, providing a viable, natural alternative without compromising effectiveness. However, further research is necessary to assess their long-term benefits and applicability across diverse populations.

CONCLUSION

In this study, the researcher demonstrated that mouth pulling with guava leaves powder significantly reduced gingivitis among adults in the Sangli-Miraj-Kupwad Corporation. The experimental group showed a marked decrease in gingival inflammation, with mean scores dropping from 1.6857 to 0.1714, compared to a lesser reduction in the control group (1.5142 to 0.4571). Statistical analysis confirmed a significant difference between groups post-intervention, reinforcing the superior efficacy of guava leaves powder over conventional treatment. These findings suggest that guava-based mouth pulling is a promising, natural approach for managing gingivitis in community oral health settings.

REFERENCES

1. Carranza's Clinical Peridontiology, Second South Asia Edition; Volume-I, page no:151- 170.
2. Ripari F, Cera A, Freda M, Zumbo G, Zara F, Vozza I. Tea tree oil versus chlorhexidine mouthwash in treatment of gingivitis: a pilot randomized, double blinded clinical trial. Eur J Dent 2020; 14 (01) 55-62.

3. Trombelli L, Farina R, Silva CO, Tatakis DN. Plaque-induced gingivitis: Case definition and diagnostic considerations. J Periodontol. 2018 Jun;89 Suppl 1:S46-S73.
4. Gupta R, Ingle NA, Kaur N, Yadav P, Ingle E, Charania Z. Effectiveness of herbal and nonherbal fluoridated toothpaste on plaque and gingivitis: A randomized controlled trial. Journal of Indian Association of Public Health Dentistry. 2015 Jul 1;13(3):218-21.
5. Aniketh TN, Idris M, Geeta IB, Nandakishore KJ, Sahu GK, Arul PT, James JM, Kareem SA. Root canal irrigants and irrigation techniques: A review. Journal of Evolution of Medical and Dental Sciences. 2015 Apr 2;4(27):4694-701.
6. Cowan MM. Plant products as antimicrobial agents. Clinical microbiology reviews. 1999 Oct 1;12(4):564-82.
7. Fabricant DS, Farnsworth NR. The value of plants used in traditional medicine for drug discovery. Environmental health perspectives. 2001 Mar;109(suppl 1):69-75.
8. Morton JF. Fruits of warm climates.
9. Gutiérrez RM, Mitchell S, Solis RV. Psidium guajava: A review of its traditional uses, phytochemistry and pharmacology. Journal of ethnopharmacology. 2008 Apr 17;117(1):1-27.
10. Ojezele M, Agunbiade S. Phytochemical constituents and medicinal properties of different extracts of anacardium occidentale and psidium guajava. Asian J Biomed Pharmaceut Sci. 2013;3:20–3.
11. Arima H, Danno G. Isolation of antimicrobial compounds from guava (Psidium guajava) and their structural elucidation. Biosci Biotechnol Biochem. 2002;66: 1727–30.
12. Gupta GK, Chahal J, Arora D. Psidium guajava Linn: current research and future prospects. J Pharm Res 2011 Jan4(1):42-46.
13. Guintu FZ, Chua AH. Effectivity of guava leaves (Psidium guajava) as mouthwash for patients with aphthous ulcers. Philippine Journal of Otolaryngology Head and Neck Surgery. 2013 Dec 1;28(2):8-13.
14. Jebashree HS, Kingsley SJ, Sathish ES, Devapriya D. Antimicrobial activity of few medicinal plants against clinically isolated human cariogenic pathogens—an in vitro study. ISRN Dent 2011 Jun;2011:541421.
15. Dani PB, Ghorpade VK. Effect of Neem Leaf Paste Application on Dandruff. Cureus. 2025 Mar 16;17(3):e80685. doi: 10.7759/cureus.80685. PMID: 40242687; PMCID: PMC11999905.
16. Mordi R, Dhudum B. Effect Of Burger Allen Exercise On Wound Healing Process Among The Diabetic Foot Ulcer Patients Admitted In Selected Hospitals. Journal of Critical Reviews. 2020;7(17):4301-5.