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The Effect Of Oil Pulling Practice With The Thiripala Mouth Wash On Gingivitis - A Prospective Comparative Interventional Study

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Abstract-

Gingivitis is the most commonly occurring periodontal disease condition, which manifests itself as the inflammation of gums and major reason for tooth loss. Oil pulling is an ancient healing practice, and has been extensively used as traditional Indian folk remedy since many years to prevent dental diseases and for strengthening teeth and gums. Coconut oil is a regular constituent in Indian food, economically cheaper compared to other oils and easily available. Herbal Mouthwash is described in the texts of Siddha and Ayurveda for the treatment of various oral and dental problems. Especially Thiripala mouth wash is described in Siddha literatures.

Aim: Present study evaluates efficacy of Thiripala mouth wash as plaque controlling agent and compares it with Oil pulling practice.

Materials and Methods: A randomized sample of 50 patients with plaque induced gingivitis was enrolled for the study and equally divided into two groups. Group A – 25 individuals used mouth wash and Group B – 25 individuals used coconut oil for oil pulling. Both the interventions are given for 21 days twice daily. Modified gingival index (GI) score and plaque index (PI) score for each group was assessed at preintervention and postintervention stage at 7th, 14th, and 21st day.

Results: No significant reduction of gingivitis and plaque index was seen in Group A and Group B at 7th day. But there is significant reduction in the severity of gingivitis and plaque index at the 14th and 21st day. Reduction was more significant in Group A compared to Group B stating that Thiripala mouth wash was comparatively found to be effective than Oil pulling in the reduction of severity of gingivitis and for a better oral hygiene.

Conclusion: The results of our study evidenced, that Thiripala mouth wash to be superior in the reduction of plaque, gingival inflammation, compared to that of Oil pulling practice.

Keywords: Gingivitis, Oil pulling, Coconut oil, , Plaque induced gingivitis

Introduction:

Periodontal diseases (such as gingivitis and periodontitis) are the most common forms of oral diseases and one of the major reasons for tooth loss [1]. The incidence of periodontal disease is found to be greatest in diabetic and heart disease patients,[2] and also a risk factor for the etiology of coronary heart disease [3]. The most prevalent oral disease among worldwide is Gingivitis and it is caused by the bacterial biofilm surrounding the teeth. Gingivitis manifests itself as the inflammation of gums, leads to swollen gums, bleeding gums and Halitosis resulting in overall poor oral hygiene and a cascade of events causing early loss of teeth, leading to dental aesthetics.

The primary factor associated with these conditions are presence of plaque biofilm. As the oral cavity serves as a focal point of entry of microorganisms into the systemic circulation [4]. Although our immune system prevents the body from virulent microorganisms, any breach in the physical barriers in the oral cavity may provide access to the systemic circulation [5]. Also a lack of oral hygiene allows an increase in virulent microbial colonization of the oral biofilm [6]. Plaque-induced gingivitis is the most common types of gingival disease, because of interaction of microorganisms in the plaque biofilm with the inflammatory cells of the host [7]. Development of this plaque is nonspecific but highly variable structural entity, resulting from colonization and growth of microorganisms on the surfaces of natural teeth and prosthesis. It plays a major role in the initiation and progression of periodontal disease. For maintenance of periodontal health, it's important to eliminate the plaque.

Periodontal therapy available for the Plaque control is broadly categorized as

Mechanical and Chemical plaque control. As mechanical plaque control is commonly executed on a regular basis as it helps in reduction of the rate of deposits, Meanwhile chemical plaque control has been successfully used for control and prevention of gingivitis. Antimicrobial mouth rinses such as Chlorhexidine, which has a broad-spectrum antimicrobial activity and is a cationic molecule, which causes bacterial cell wall lysis and rupture. It is found to be very effective in reducing the oral microbial load and also effective in the maintenance of oral hygiene. Mean while these mouth rinses has some of the side effects such as burning sensation, staining of teeth, metallic taste, and altered taste sensation. On considering over the disadvantages and advantages of the mouth rinses, the alternate and complementary methods such as Oil pulling and Thiripala mouth wash was recommended and supported by many literature evidences. Oil pulling is a traditional remedy originally practised in ancient India for the maintenance of Hygiene and oral health. The ayurvedic concept describes that the oil pulls out toxins, which are known as 'ama' in Ayurvedic medicine. Oil pulling practice ensures a powerful cleansing and healing effect on the mouth, sinuses and rest of the body [8]. Oil pulling is also more cost-effective than chlorhexidine, with no associated side effects like allergic reactions, and mucosal staining following prolong use [9]. It is also referred to cure over thirty systemic diseases including headaches, migraine, and chronic diseases such as asthma and diabetes mellitus. Also conferring multiple oral health benefits and strengthening of muscles and jaws in the oral cavity [10]. A recent study suggests, it can improve acne, strengthen gums and jaws and heal bleeding gums [11]. Scientific evidence also suggests, that oil pulling therapy may reduce plaque and gingival scores and also the total oral bacterial count. Furthermore, it has also shown to diminish the susceptibility to dental caries from marked to slight or moderate level [12]. A randomized clinical trial evidenced the effect of oil pulling on specific pathogens [13]. A recent review suggested that it may have beneficial effects in dental hygiene, but requires more rigorous and better reported clinical trials [14].

The procedure of oil pulling involves swishing a measured volume of oil around the mouth for a period of time, forcing the oil in between all the teeth and around the mouth. For oil pulling, the most commonly used organic oils includes coconut oil, sunflower oil and sesame oil [15]. Coconut oil is a cheap and readily accessible oil for many people around the world. An added advantage of coconut oil is, it is composed mostly of medium chain fatty acids when compared to the majority of other dietary oils, which are predominantly made up of long chain fatty acids. Many of these medium-chain fatty acids are lauric acid, known for its antimicrobial and anti-inflammatory benefits. Hence oil pulling with coconut oil could potentially give an colossal health benefits [16]. Adding to this, an Invitro study using biofilm models have reported the antimicrobial properties of coconut oil against *Streptococcus mutans* and *Candida albicans* [17]. A recent randomized controlled trial with oil pulling therapy compared to chlorhexidine group has shown a significant decrease in gingival index scores and plaque scores [18]. In a recent study, the gingivitis decreased by 52-60% whereas the plaque scores reduced by 18-30% [19]. Another study also showed a reduction in plaque scores following 45 days of oil pulling therapy using sunflower oil [20]. Furthermore, evidence from both biological and clinical assessments showed that oil pulling was effective against plaque-induced gingivitis [21]. Oil pulling is the practice of swirling oil (most commonly coconut oil) around the mouth and then spitting it out. Oil pulling should be done preferably in the morning on an empty stomach. One tablespoon (approximately 10 ml), of coconut oil, being the recommended dose for adults, which is swished between the teeth for a duration of approximately 10-15 min and spit out. Rinsing should be continued for perhaps 10 to 15 minutes, so that the edible oil is pulled through the teeth and mouth. On swishing the oil in the oral cavity for the recommended duration will change the viscosity of the oil, it turns milky white with a thin consistency [22]. Swallowing the oil should be avoided, as it may have toxins and bacteria [23]. The practice is advised to perform 3 times daily and not advisable for children below

the age of 5 years to perform oil pulling even though there are no suggested contraindications [24].

The herbal products are used for centuries for oral health and dental hygiene has been reported in the literature. Herbal medications have received a lot of attention in the recent years because of their vast variety of biological and therapeutic activity, ease of access, better safety margins, and cheaper cost. Indian system of medicines such as Siddha and Ayurveda medicines have been utilized to treat periodontal problems since ancient times [25]. Oral rinses containing herbal medications are also used to decrease gingival irritation and bleeding [26]. One among the herbal product, Thiripala is used in the Indian System of Medicine, especially in siddha system of medicine from time immemorial with many potential systemic benefits [27]. Thiripala means three herbal constituents in equal proportions, i.e., *Terminalia chebula*, *Terminalia bellirica*, and *Embilica officinalis* [28]. All these constituents has been studied and reported as they exhibit strong antioxidant, anti-inflammatory, analgesic, astringent, antimetastatic immunomodulatory properties, etc. The antiplaque efficacy of Triphala was found to be more effective without any adverse effects when compared to chlorhexidine (CHX) [29]. The antibacterial and antioxidant properties of Thiripala have been demonstrated in vitro, on inhibiting *S. mutan* with doses as low as 50 g/ml. The *T. chebula* extract effectively prevented plaque development on the tooth surface by inhibiting two mechanisms such as sucrose-induced adhesion and glucan-induced aggregation which promotes the colonization of the organism on the tooth surface. Also the extract of *T. Chebula* prevents the growth and accumulation of *Streptococcus mutans* and prevents the buildup of acids on the tooth's surface, which would resulting in additional demineralization and enamel disintegration. Hence the Thirupala extract may be a useful agent in the treatment of caries teeth [30]. the tannic acid present in Thiripala is responsible for antiplaque action. The action is which binds to the groups on the surface of bacterial cells, causing protein denaturation and, eventually, bacterial cell death [31]. Thiripala mouthwash usage as a plaque control agent contains xylitol, a sugar substitute that does not cause tooth decay. Its effect on gingivitis has been studied modest and extensive research study has to come up to prove its potential benefits [32].

These two methods such as oil pulling and Thiripala wash have elicited their beneficial effects on gingivitis apart from their various systemic and immunological benefits. Hence this study was attempted to compare the efficacy and beneficiary of these two methods on the antiplaque and antingivitis effects.

Materials and Methods:

This study is a comparative prospective interventional study. Institutional ethics committee approval has been obtained before the initiation of the study. Written Informed consent was obtained from each participants enrolled in the study. The study was conducted in accordance with Helsinki declaration [33]. Study was conducted at Sri Sairam Siddha Medical College and Research Centre, West Tambaram, Chennai, Tamil Nadu, India

Inclusion criteria of the study as follows

1. Individuals with plaque- induced mild- to- moderate gingivitis.
2. Age >20 years
3. Systemically healthy individuals

Exclusion criteria were the following:

1. Mouthwash use in past 3 months
2. Use of antibiotic and steroid medications in the past 3 months
3. Pregnancy and Lactating mother
4. Individuals with smoking and other tobacco-related habits,
5. History of dental treatments in the past 3 months,
6. Orthodontic and prosthetic appliances used
7. Systemic disorders like diabetes mellitus, cardiac diseases, renal failure, and so on

Selection of study population are based on inclusion and exclusion criteria. Fifty patients both male and female with plaque-induced gingivitis were enrolled for the study. Randomization of the subjects are done by random computer allocation. The study subjects are divided into 2 groups of 25 each, which included

Group B with total of 25 participants of which 14 males and 11 females in the age group range from 22 to 50 diagnosed with plaque- induced gingivitis who were advised to practice Thiripala mouth wash practice along with routine tooth brushing

Group A with total of 20 participants of which 13 males and 12 females in the age group range from 21 to 51 with plaque- induced gingivitis who were advised to practice Coconut oil pulling along with routine tooth brushing.

Group B was given mouth wash for 7 days, for 14 days and for 21 days twice daily after cleaning the oral cavity with water. The mouthwash was used for 2 minutes by vigorous swishing in mouth (mouth rinse).

Group A was allocated for oil pulling intervention for 7 days, for 14 days and for 21 days twice daily after cleaning the oral cavity with water. They were advised to take a comfortable quantity (around 10ml) of coconut oil in the mouth and swish it around the mouth, gums, teeth, and tongue before brushing and consuming any fluids in the morning. Once the oil becomes viscous and milky, it should spit into the trash and then rinse the mouth with warm water. All the patients were kept on standardized oral hygiene protocol [34].

Gingival index and plaque index, were recorded at baseline, 7th day, 14th day, and the 21st day. Individuals unable to continue the practice due to difficulty were allowed to withdrawn from the study, and new participants were included in the study. Standard protocol followed for preparation of Thiripala under in-house pharmacy of Sri Sairam Siddha Medical College and Research Centre, Chennai Coarse powder of Thiripala was prepared by in-house pharmacy of Sri Sairam Siddha Medical College and Research Centre, Chennai.

Data analysis:

GI score and PI score was calculated for the entire group at pre intervention and 7th, 14th, and 21st day of post intervention. Post-intervention gingival status for the Group A, Group B, participants was assessed using modified GI at the 7th, 14th, and 21st day. Statistical analysis was carried out using SPSS version 21.0 (SPSS, Inc, Somers, NY, USA). A comparison of the mean differences of the gingival and plaque indexes was done by a paired t test within the groups at different time intervals and unpaired t test was used for intergroup comparison. The P value i.e $P \leq 0.05$ (95% confidence interval) was kept as Level of significance.

Results:

The present study was undertaken to compare the effect of Thiripala mouth wash and oil pulling practice in reducing the severity of plaque- induced gingivitis.

Gingival Index (GI):

Gingival status at baseline (0 day) was assessed using modified gingival index (GI) for all the study participants. At baseline, there was no statistical difference between the 2 interventional groups. i.e Group A and group B for gingival index. Both interventional groups reported significant reduction in gingival index after 14 days and 21 days.

Oil Pulling group (Group A): The values of mean $\pm$ SD for gingival index at baseline, 7 days, 14 days, and 21 days were 1.81 ± 0.227 , 1.74 ± 0.435 , 1.16 ± 0.218 , and 0.531 ± 0.256 , respectively. Thiripala group (Group B): The values of mean $\pm$ SD for gingival index at 0 day, 7 days, 14 days, and 21 days were 1.753 ± 0.331 , 1.691 ± 0.432 , 1.323 ± 0.254 , and 0.612 ± 0.217 , respectively. There is no statistical difference in gingival index between the groups after 7 days. Meanwhile there was a statistically significant difference in gingival index after 14 days 21 days (Table 1).

Table 1: Comparison of mean modified gingival index score across the study groups during the study period

Duration of intervention	Group A	Group B	P value
O day	1.753 ± 0.331	1.81 ± 0.227	0.21
7 days	1.691 ± 0.432	1.74 ± 0.435	0.41
14 days	1.323 ± 0.254	1.16 ± 0.218	0.00
21days	0.612 ± 0.217	0.531 ± 0.256	0.04

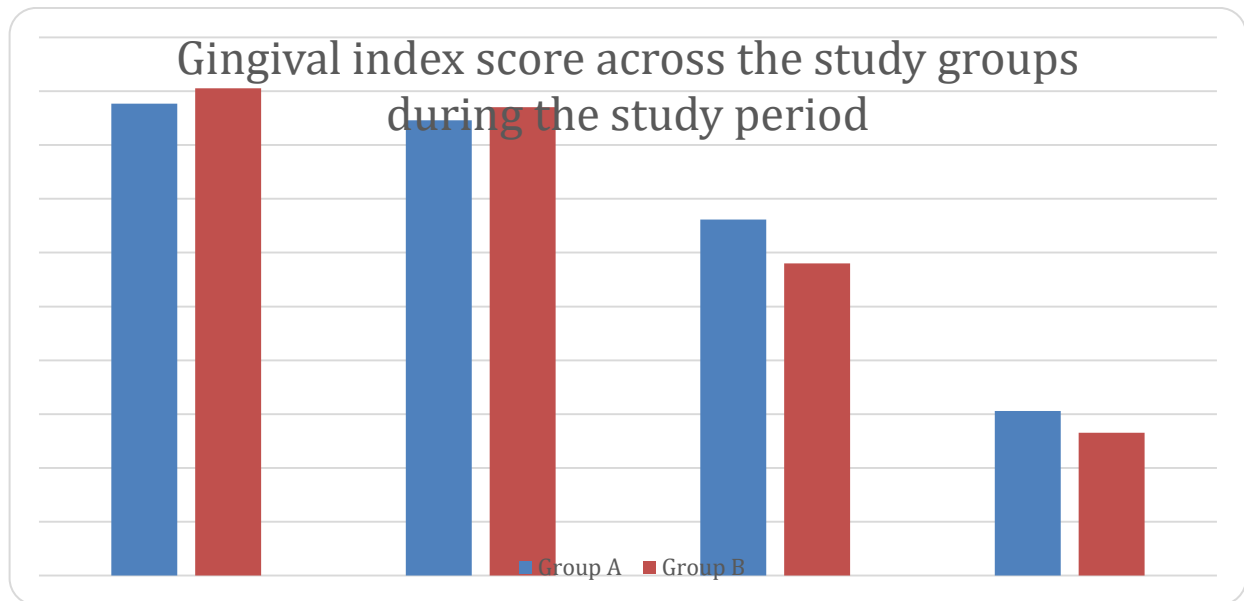


Figure 1: Gingival index (GI) of group A versus group B.

Plaque Index (PI):

Both treatment groups reported significant reduction in plaque index from baseline to 14 days and 21 days but not in 7 days.

Oil pulling group (Group A): The values of mean $\pm$ SD for plaque index at baseline, 7 days, 14 days, and 21 days were 2.86 ± 0.228 , 2.21 ± 0.752 , 1.38 ± 0.249 , and 0.898 ± 0.263 , respectively. Thiripala group (Group B): The values of mean $\pm$ SD for plaque index at baseline, 7 days, 14 days, and 21 days were 2.16 ± 0.324 , 1.99 ± 0.251 , 1.336 ± 0.325 , and 0.893 ± 0.218 , respectively. There was a statistically significant difference in plaque index . There was a statistically significant difference in plaque index after 14 days and 21 days between the groups and (Table 2).

Table 2: Comparison of Plaque Index (PI) score between the study groups during the study period

Duration of intervention	Group A	Group B	P value
O day	2.16 ± 0.324	2.86 ± 0.228	0.12
7 days	1.99 ± 0.251	2.21 ± 0.752	1.01
14 days	1.336 ± 0.325	1.38 ± 0.249	0.06
21 days	0.693 ± 0.218	0.898 ± 0.263	0.05

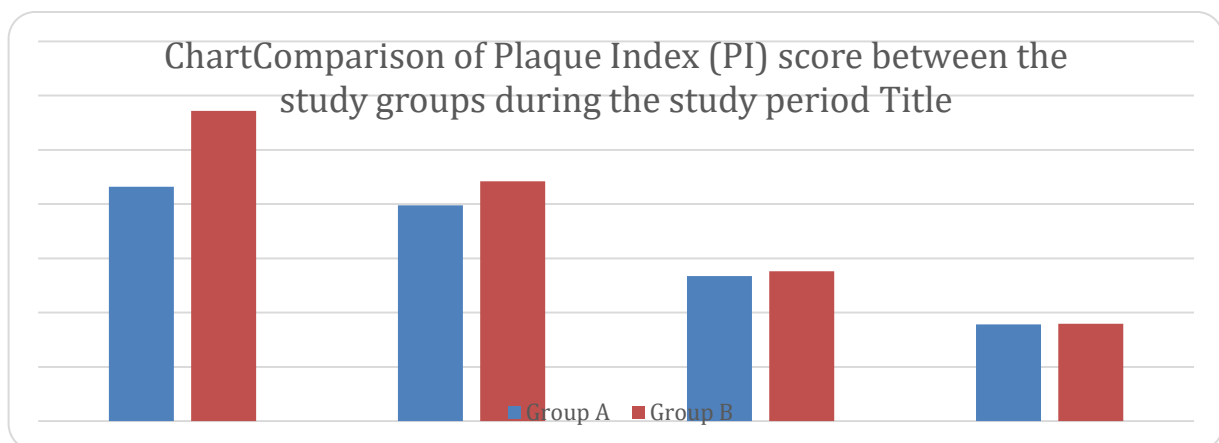


Figure 2: Plaque index (PI) of group A versus group B.

Intergroup Comparison of Plaque Index (PI) and Gingival Index (GI) (Mean $\pm$ SD) at Various Time Intervals.

The group A has shown a statistical significant on Plaque Index from baseline to 14 days and 21 days whereas Group B has shown the same significant on plaque index from baseline to 14 days and 21 days and not significant for 7 days intervention. But the significant levels are higher in Group A compared to group B.

On assessment of Gingival index the Group A has not shown significant from baseline to 7 days but statistically significant after 14 days and 21 days of intervention from baseline. Whereas the Group B has shown the similar but comparatively lesser significant than Group A, Group B has not shown significant from baseline to 7 days but statistically significant after 14 days and 21 days of intervention from baseline.

Table 3: Intergroup Comparison of Plaque Index (PI) and Gingival Index (GI) (Mean $\pm$ SD) at Various Time Intervals.

Group A

Duration of intervention	PI	P value
0 - 7 days	1.81 + 0.227 1.74 + 0.435	0.30
7 - 14 days	1.74 + 0.435 1.16 + 0.218	0.05
14 - 21 days	1.74 + 0.435 1.16 + 0.218	<0.001

Group B

Duration of intervention	PI	P value
0 - 7 days	2.16 $\pm$ 0.324 1.99 $\pm$ 0.251	0.6
7 - 14 days	1.99 $\pm$ 0.251 1.336 $\pm$ 0.325	<0.001
14 - 21 days	1.336 $\pm$ 0.325 0.612 $\pm$ 0.217	<0.001

Group A

Duration of intervention	GI	P value
0 - 7 days	1.753 $\pm$ 0.331 1.691 $\pm$ 0.432	0.32
7 - 14 days	1.691 $\pm$ 0.432 1.323 $\pm$ 0.254	0.00
14 - 21 days	1.323 $\pm$ 0.254 0.612 $\pm$ 0.217	<0.001

Group B

Duration of intervention	GI	P value
0 - 7 days	1.81 + 0.227 1.74 + 0.435	0.26
7 - 14 days	1.74 + 0.435 1.16 + 0.218	<0.001
14 - 21 days	1.16 + 0.218 0.531 + 0.256	<0.001

On analysis of the results, it evidences that, both the intervention are statistically significant after a particular duration but Group B shown better significant than Group A . This study Emphasis on an increased duration of Thiripala may give a better result than Oil pulling and enhanced reduction of plaque index and gingivitis. Further studies with larger sample and longer duration is required to bring the scientific validation of the interventions.

Discussion:

The present study was designed to evaluate the effect of Thiripala mouth wash and Oil pulling practice on gingivitis and plaque inhibition. There are limited studies on use of Oil pulling and Thiripala mouth rinse to treat the aforementioned oral conditions. Our study may be the first of its kind in comparing the efficacy of Oil pulling with Thiripala mouth wash in reducing the gingival inflammation, plaque scores, in patient with generalized gingivitis included a total sample of 50 patients divided into two equal groups. Both the parameters PI and GI scores were evaluated at B/L, 7 days, 14 days, and 21 days after the usage of respective practices. Both interventions were effective in reducing the scores of PI and GI, when compared to the B/L values in our study.

However, the results of GIs and PIs were more consistent in Thiripala group at the end of 21 days followed by oil pulling practice.

As a known fact, that Chlorhexidine mouthwashes are used as an adjunct to the clinical management of caries and periodontal diseases. But it is associated with slightly lower compliance due to its unpleasant taste and unwanted effects such as staining, which is associated with extrinsic staining of teeth, while the zinc and stannous salts have organoleptic properties. Hence its usage is limited on concentration basis. Whereas oil pulling techniques has not been associated with any such side effects [35]. A randomized controlled trial conducted recently supported our study, showed a significant decrease in modified gingival index scores and plaque scores following oil pulling therapy when compared to chlorhexidine group [36]. A recent study has shown the Oil pulling have an antibacterial activity against *S. mutans* and *C. albicans* using coconut oil as mentioned in our study, Also following a 40-day regimen of oil pulling, an average reduction of 20% in the total microbial count was observed in the oral cavity [37]. A study conducted by Sezgin et al. assessed gingival index score, found no significant difference after 14 days ($p = 0.286$) in the gingival index score between the Oil pulling group and Chlorhexidine group [38]. A study conducted by Jauhari et al. reported, there was reductions in the bacterial colony count for the OIL group, however there was no statistically significant difference with this result ($p = 0.097$) [39]. Meanwhile a contrasting effect has been reported by Kaushik et al. stating that reduction in the total bacterial colony count. In addition, there was a statistically significant difference ($p = 0.0256$) between the reduction in total salivary bacterial colony count between the OIL and control groups ($p = 0.05$) [40].

Though oil pulling is beneficial, a systematic review reported that small number of articles described cases of lipid pneumonia in patients who regularly practice oil pulling [41, 42]. However, in all case reports in the Systematic and Meta analysis review, the patients were reported as suffering with swallowing dysfunctions and or were at a high risk of aspiration on practice oil pulling.

Taking the above facts into consideration, an alternate method without contraindications and safe are preferred to maintain oral hygiene and treat these conditions. Gingival bleeding and inflammation are also being treated with herbal mouth rinses [43,44]. Thiripala is one of the polyherbal formulations used traditionally in Siddha medicine, comprises the dried fruits of three plants, namely, *Terminalia chebula* Retz (Family Combretaceae R. Br), *Terminalia bellirica* (Gaertn.) Roxb (Family Combretaceae R. Br), and *Phyllanthus emblica* L (Family Phyllanthaceae Martinov). The composition of Thiripala is derived from a rational combination of all the aforementioned, mixed in equal proportions (1:1:1). They are combined to balance the three pillars of life or elemental substances, known as the three dosham or mukktam, namely, Vatham (elements of space and air), Kabam (elements of earth and water), and Pittam (elements of fire and water) according to siddha concepts. Research studies carried out in the past two decades have validated many of the ethnomedicinal properties and researches have shown Triphala to possess antiinflammatory, antipyretic, analgesic, antibacterial, antimutagenic, antistress, anticariogenic, adaptogenic, antioxidant, free radical scavenging, wound healing, hypoglycaemic, anticancer, chemoprotective, radioprotective and chemopreventive effects. As it has anti-inflammatory, wound cleansing and analgesic actions, which will be beneficial in treating the inflammation of gingiva. *Phyllanthus emblica* is a rich source of vitamin C, which is required for collagen maturation and is essential to maintain firm and healthy gingival. The earliest clinical trial conducted by Maurya et al on Triphala and its role in periodontal disease, studied effect of Thiripala alone and as an adjunct to metronidazole in treatment of periodontal disease. This study concluded that the drug Thiripala or metronidazole alone is capable of providing partial relief but when both are used in a integrated form, they are more effective for the treatment of periodontal disease [45]. The above findings are supported in a recent trial done by Tripathi and Tiwari [46].

The antioxidant activity of Thiripala is attributed to its constituents, such as phenols, tannins, and glycosides [47]. Biradar *et al* chemically examined on Thiripala reported that, the main components were tannic acid, chebulic acid, and flavinoids. Due to the presence of tannins in Thiripala may limit the number of bacteria accessible for binding to the tooth surface during the early stages of plaque formation by enhancing the physical clearance of germs from the oral cavity through the aggregate formation [48]. Also a study by kumar et al reported, Polyphenols and ascorbic acid are abundant in Thiripala. As these polyphenols are considered to be antimicrobial agents. Epi Gallo Catechin Gallate (EGCG), one of the condensed tannins has been identified in Thiripala [49]. This EGCG binds to bacteria's cell walls limiting their development, inhibits biosynthesis, increasing an inhibitory effect on proteases and collagenase. Finally it helps to promote collagen production by inhibiting the aforementioned enzymes from degrading collagen. Also one of the most active component, Ascorbic acid in Thiripala, promotes collagen production at any inflammatory location

[50]. An in vitro study by Prabhakar et al., concluded that Thiripala is efficient in inhibition of plaque biofilm and hence is effective in treating tooth biofilm infection. Similar observations were seen in our study where the plaque index improved at 14 and 21 days from baseline for both Thiripala and oil pulling group [51]. Few studies have also shown that Thiripala was effective in preventing dental caries and that this effect was equal to that of chlorhexidine.

A Study conducted by Bajaj et al., concluded that Thiripala and chlorhexidine showed similar inhibitory effect on microbial counts, except lactobacillus, whereas Thiripala has shown superior results than chlorhexidine, parallel findings to present study. [52]. Similar methodology followed by Gupta et al., showed analogous to the study by Bajaj et al., on preventing plaque accumulation and gingivitis concluded that Thiripala was highly effective when compared to chlorhexidine mouth rinse [53].

Limitations:

The limitations of our study are attributed to sample size and the findings cannot be generalized, due to smaller sample size and the inability to document long-term side effects. Further studies with larger sample size are recommended for evaluating the efficacy of oil pulling and Thiripala in evaluating their antiplaque and antigingivitis activity. Further pharmacological studies are needed to assess for the drug interaction ability of Thiripala and to understand the possible drug interactions if any.

Conclusion:

As Chlorohexidine is considered to be gold standard agent for chemical plaque, various techniques and herbal preparations are in demand to overcome the side effects associated with chlorohexidine. Oil pulling therapy procedure promotes good oral and systemic health through incorporating the use of oil based oral rinses in the daily oral hygiene routine. Many studies have been conducted recently supporting this ancient technique for its health benefits. In developing countries and rural communities, access to oral care is minimal, and the use of toothbrushes, toothpaste, and mouthwashes, therefore oil pulling can serve as an affordable option and improve oral health outcomes. In the present study, coconut oil pulling showed a significant reduction of plaque scores and gingivitis. Hence, could be used as a preventive home therapy to maintain oral hygiene, especially in developing countries. Meanwhile fewer adverse effects such as lipid pneumonia in patients who regularly practice oil pulling have been reported and also the practical difficulty as suffering with swallowing dysfunctions and or were at a high risk of aspiration on practice oil pulling are reported by patients. Hence forth Thiripala mouth wash, because of their herbal nature might be considered as an alternative adjuvant therapy, advised for oral health. It is easy to prepare, safe, organic, and relatively economical compared with chlorhexidine. Since no adverse effects are reported in our study, from literature and previous studies. Hence it is concluded from our study findings, that Thiripala shown a superior efficacy than oil pulling, It can be preferred and used for effective plaque control, gingivitis control, and halitosis.

Authors Contribution:

Dr Ramani contributed towards conception of design, preparation of Triphala mouthwash and oil pulling intervention, writing the manuscript. Dr Chitra contributed towards conception of design, collection of dental data, gingival index and plaque index. Dr Suresh contributed toward interpretation of data and review of manuscript. Dr Elavarasi contributed for writing and editing the manuscript. Dr Selvakumar contributed for data analysis and publication guidance.

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Conflicting Interests

The authors declares no potential conflicts of interest

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