



Review article

Oil pulling - A natural therapy for oral health stress management

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ABSTRACT

The indigenous systems of medicines, specifically, Ayurveda have been practiced since centuries. Even though dentistry was not a specialized branch of Ayurveda, it is included in its Shalaky Tantra (system of surgery). Deformities such as oral cavity, plaques and infections were managed in ancient India by using plant based drugs as they are used frequently due to their relatively safe and effective nature. These drugs are being overlooked and not the part of main course of treatments. However, recent studies have been reported their multidimensional therapeutic potential and also comparatively effective and rapid onset of action. Oil pulling (Kaval, Gandush) practice is claimed to cure about 30 systemic diseases. The oil therapy is preventative as well as curative. Ayurveda advises oil gargling to purify the entire system as it holds that each section of the tongue is connected to different organs such as to the kidneys, lungs, liver, heart, small intestines, stomach, colon, and spine etc. Oil pulling has been used extensively as a traditional Indian folk remedy for many years to prevent decay, bleeding gums, dryness of throat, for strengthening teeth, gums and the jaw. It is a powerful detoxifying Ayurvedic technique. It can be done using oils like sunflower oil or sesame oil. Thus, Scientific validations of the Ayurvedic dental health practices could justify their incorporation into modern dental care. Use of safe, quality products and practices should be ensured based on available evidence if traditional medicine is to be acknowledged as part of primary health care.

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INTRODUCTION

Health stress management is a big issue today. Most of the knowledge and help we get from the modern day thinking is to suppress or divert our attention from the issue of stress. They implicitly operate with an assumption that stress will be inevitably generated and the solution lies in doing something about it once we are stressed. "Let us kill it or run away from it by some means after it happens" is the basis for stress management. We do not seem to address why one should get stressed in the first place.

*Ath ken prayuktoyam paapam charati purushah,
Anichchhatrapi varshney baladiv niyojitah.
Bhagavat Gita 3.36*

In this *shloka*, Arjuna raises a question which is very pertinent to most of us. We have had several occasions in our personal and professional life during which we would have internally asked the same question.

Who is behind all these bad or wrong things that we do? Although I am not interested it appears I am forcibly involved into this.

If we develop the skill, orientation and attitude to draw upon the repository of knowledge for our day to day living issues, then we will realize that the world of ancient Indian wisdom opens up. One may locate a number of direct and relevant thoughts in these texts.

In fact we ask questions to others who have erred in their decisions or committed some blunder, you ask fathers who have made blunders of scolding their children or taken wrong decisions about their daughter or son. They will always say something similar to this *shloka*. There is this feeling – I have become a victim of a situation as though somebody is pushing me to do wrong things. We have gone through this frame of mind in our daily life. We are going through this frame of mind every now and then in our self-health management.

Krishna offers some explanation as to why this is happening in the *shlokas* that follow. Gita also offers perspectives on how to manage certain

things in life, understand complex things that we go through in simple terms (just as the example of birth and death). It also offers direct ideas and sets us in a state of contemplation. One example will help drive this point.

*Matrasparshstu kaunteya sheetoshnsukhduhadah,
Aagmapayinoanityah tanstiteekshaswa bharat.
Bhagavat Gita 2.14*

The meaning of the *shloka* is - “As long as the five senses are active in gathering the signals that come into contact with them, we will experience the world of dualities – hot and cold, peace and sorrow etc. You cannot run away from the world of dualities as they happen continuously and are also impermanent. Learning to handle them is important.”

On the other hand, this *shloka* addresses this issue and truly provides us an idea for “managing” this stress. It is all about signal processing. We have to differentiate between signals and noise. That is the idea here. We don’t do so because we don’t have the capability of signal processing. That does not mean we can turn off the apparatus and stop receiving the signals. That happens only when we are in a state of coma. That is not what Lord Krishna is saying. *Gita* never recommends running away from problems. On the other hand it seems to suggest that understanding problems in the right perspective is key to managing them. The idea of managing the world of duality (*samatwam yoga uchyate*) has been one of the key messages in the *Gita*. Several studies show that 90% individuals suffer from one or more dental problems. Our oral hygiene practices and diet have a significant effect on our dental health. Oil pulling is a developed technique that helps in preventing dental diseases and maintaining overall dental health.

DENTAL CARIES (DECAY)

Dental decay is due to the dissolution of tooth mineral (primarily hydroxyapatite, $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$) by acids derived from bacterial fermentation of sucrose and other dietary carbohydrates (Dawes, 2003). These bacteria live in bacterial communities known as dental plaque which accumulates on the tooth surface. For almost a century it was believed that any bacterial community on the tooth surface could cause decay, and treatment was almost exclusively the mechanical cleaning of these surfaces by tooth brushing, using some type of mild abrasive. Such treatments based upon debridement and, in extreme cases, upon dietary carbohydrate restriction, were singularly unsuccessful in reducing dental decay. Things have changed. Water fluoridation has proven to be a most cost-effective way of reducing decay; fluoride dentifrices were even more effective than initially projected; and research findings indicate that most carious lesions actually reflect a sucrose-dependent *Streptococcus mutans* infection.

Individuals at risk for this infection can be diagnosed and treated by frequent mechanical intervention, by intensive application of prescription levels of fluorides or other antimicrobials (such as chlorohexadine), by restriction of ingestion of sucrose between meals, or by use of products that contain sucrose substitutes (such as xylitol). The net result is that dental decay in the late 20th century is a controllable infection and should be preventable in many individuals. Somehow carries free and some have dropped the plaque.

PLAQUE

The dental plaque formation involves huge colonies of bacteria. Dental Plaque is a biofilm on the surface of the teeth. Due to the large number of colonies of microorganisms, they produce more amounts of metabolites which results in dental disease on the teeth and gingival tissues (Keerthana and Jeevananda, 2018). If the teeth is not hygienated through brushing or flossing, then the plaque forms into tartar (its hardened form) and leads to periodontal disease or gingivitis. Plaque bacteria elaborate various compounds (H_2S , NH_3 , amines, toxins, enzymes, antigens, etc.) that elicit an inflammatory response that is protective but also is responsible for loss of periodontal tissue, pocket formation, and loosening and loss of teeth.

GINGIVITIS

Gingivitis is an inflammation of the gums, usually caused by a bacterial infection. If left untreated, it can become a more serious infection known as periodontitis. Gums actually get attach to the teeth at a lower point. This forms a small space called a sulcus. Food can get trapped in this space and cause a gum infection or gingivitis (Alsarraf et al., 2019). Plaque is a thin film of bacteria. It constantly forms on the surface of your teeth. As plaque advances, it hardens and becomes tartar. You can develop an infection when plaque extends below the gum line. Left unchecked, gingivitis can cause the gums to separate from the teeth. This can cause injury to the soft tissue and bone supporting the teeth.

The following are risk factors for gingivitis: Smoking or chewing tobacco, diabetes, consuming certain medications (oral contraceptives, steroids, anticonvulsants, calcium channel blockers, and chemotherapy), pregnancy, genetic factors, compromised immunity (such as HIV/AIDS patients)

OIL PULLING

Oil pulling or oil swishing, in alternative medicine is a procedure that involves swishing oil in the mouth for oral and systemic health benefits. It is mentioned in the Ayurvedic text Charaka

Samhita (Sutrasthana 5, 78.80) where it is called Kavala Gandoosha/Kavala Graha and is claimed to cure about 30 systemic diseases ranging from headache and migraine to diabetes and asthma. Oil pulling has been used extensively as a traditional Indian remedy for many years to prevent decay, oral malodor, bleeding gums, dryness of the throat, and cracked lips and for strengthening teeth, gums, and the jaw (Sooryavanshi and Mardikar, 1994). Oil pulling therapy can be done using edible oils like sunflower or sesame oil. Oil pulling is very simple, completely harmless, and inexpensive unlike most of medical treatment. The cost is the price of a daily spoonful of vegetable oil—cheaper than even a vitamin tablet. Yet it is one of the most powerful forms of therapy. A specific type of oil pulling called “Roopana Gandoosha” has been mentioned in Ashtanga Sangraha and is said to have dental benefits (Various oils like Refined Sunflower oil, Sesame oil, Olive oil etc. can be used for Oil Pulling. Liquids from milk and water to extracts of Gooseberries and mangoes have been used for oil pulling (Edible and essential oils used for oil pulling. It was considered as a simple rejuvenating treatment which when done on a routine basis would enhance the senses, maintains clarity, brings about a feeling of freshness. These cleansing modalities can also benefit bad breath, dry face, dull senses, exhaustion, and anorexia, loss of taste, impaired vision and sore throat. With regards to the oral cavity oil pulling showed a reduction in the plaque accumulation and gingival inflammation

Oil pulling therapy has been proved to be very effective in preventing common dental problems like tooth pain, teeth stain and bleeding gums or gingivitis. It can also cure different types of oral infections, tooth sensitivity, cavities and even bad breath. Moreover, oil pulling therapy can be done easily at home.

Oil pulling therapy is an easy but lengthy process. You might feel a bit uncomfortable at first but gradually you will get used with using oil as you observe its benefits. What you do is take organic coconut oil and swish it around your mouth for 15 to 20 minutes just like how you would use your mouthwash. It might seem to take a little long you but once you get into the habit, you won't feel the length of time. After swishing with organic coconut oil, swish with fresh water.

Oil pulling is best to do in the morning and add it to your morning ritual of brushing and flossing before eating or drinking anything. Repeating the procedure up to three times a day should give best results but there should be at least four hours between eating or drinking anything and doing oil pulling.

Another way to do oil pulling is to take some oil on your finger and rub it slowly on your gums. Leave it for a few minutes and then rinse with fresh water. The result depends on how you properly do it and for how long you stick to the routine.

Oral infections and diseases normally start if there are gaps between our teeth because these gaps are tough to reach or clean. The oil pulling therapy helps in pulling out the bacteria hiding in teeth gaps and thus, avoiding the development of dental issues.

Oral cavity is one of the most complex parts of the human body that consists of hard and soft tissues and harbors a variety of microbial community which makes it vulnerable to infectious diseases. One of the most common infectious diseases of the oral cavity is dental caries, which has multi-factorial etiology such as diet, micro flora, host and time. It has been demonstrated that micro-organisms are one of the major etiological factors. Amongst the pathogenic flora *Streptococcus mutans* is considered to be the main microorganism associated with dental caries. Chlorhexidine, a cationic bisbiguanide with a very broad antimicrobial spectrum is the most widely used over the counter mouth rinse. It is used as an adjunct to mechanical cleaning procedures as well as used alone. It binds to soft and hard tissues in the mouth, enabling it to act over a long period after application of a formulation. However, chlorhexidine has several side effects, such as staining and taste alteration, which limit its long term use. Therefore, chlorhexidine is used as a positive control in many clinical trials and is considered the gold standard.

Coconut oil exhibited antimicrobial activity against *S. mutans* (2.5 log reductions) and *C. albicans* (1 log reduction). Sesame oil had antibacterial activity against *S. mutans* (1 log reduction) and sunflower oil had antifungal activity against *C. albicans* (1 log reduction). For chlorhexidine, which was used as a positive control, *S. mutans* was completely removed from the biofilm and 1.5 log reductions of *C. albicans* were observed. *L. casei* was found to be resistant to all tested oils, whereas three log reductions were shown after chlorhexidine exposure (Thaweboon et al., 2011).

Oil-pulling therapy with sesame oil or sunflower oil has been extensively used as a traditional Indian folk remedy for many years. It is claimed to have advantages over commercial mouthwashes since it causes no staining, has no lingering after taste, causes no allergic reactions and is readily available in the household. The mechanisms of oil-pulling action are not known. It has been proposed, however, that the viscosity of the oil can inhibit bacterial adhesion and plaque coaggregation. The other possible mechanism might be the saponification process that occurs as a result of alkali hydrolysis of oil by bicarbonates in saliva. These soaps are good cleansing agents and might be effective in removing microorganisms or plaque materials. Sufficient scientific research has not been carried out to evaluate the beneficial effect of oil pulling therapy on oral health and this needs to be addressed. This study was therefore

planned to investigate the effect of oil-pulling with several edible oils on oral microorganisms related to dental caries using biofilm models (Asokan et al., 2008).

Bacterial resistance has been increasingly reported worldwide and is one of the major causes of failure in the treatment of infectious diseases. Natural-based products, including plant secondary metabolites (phytochemicals), it will be used to inhibit the growth of microorganism. The antibacterial effect and mode of action of selected essential oils (EOs) components: carveol, carvone, citronellol, and citronellal, against *Escherichia coli* and *Staphylococcus aureus*. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were assessed for the selected EOs components. Moreover, physicochemical bacterial surface characterization, bacterial surface charge, membrane integrity, and leakage assays were used to investigate the antimicrobial mode of action of EOs components. Citronellol was the most effective molecule against both pathogens. Changes in the hydrophobicity, surface charge, and membrane integrity with the subsequent leakage from *E. coli* and *S. aureus* were observed after exposure to EOs. The selected EOs have significant antimicrobial activity against the bacteria tested, acting on the cell surface and causing the disruption of the bacterial membrane. Moreover, these are alternatives to be used as an antibacterial and antifungal (Lopez-Romero et al., 2015).

CONCEPTUALIZATION

Comprehensive review literature was done on various oils and extracts for the oil pulling in context to Ayurveda from the Ayurvedic pharmacopeia. Maximum oils were only taken. Then a metadata analysis was done on all oils. Edible oils were also taken as carrier oils for other essential oils. Basil, Clove and Timur extracted oil taken. The oils taken were edible as well as essential, edible oils are Sunflower, Rice bran oil and Sesame, while essential oil are Lavender, Basil, Clove, Timur, mentha and Thymol. Mulethi extract was also used. The oils were taken from the Patanjali Natural Coloroma Pvt. Ltd. Then the testing for oils was done by Gas Chromatography. The peaks obtained were compared with standard reference peak from ayurvedic pharmacopeia. Mulethi extracts HPLC was done. Then TLC of individual oils was done whose Rf values were compared with ayurvedic pharmacopeia. That showed that the oils had presence of their individual active component. Then according to the maximum dosage given in Ayurvedic Pharmacopeia the formulation was made for oil pulling. 3 different forms of same concept were done that's - Gel, Paste and Oil itself, so that the person can use the product according to their convenience. Anti-microbial test was done of

individual on streptococcus strain. The zone of inhibition obtained of oils. Basil oil, grape seed oil and thymol showed maximum anti-bacterial activity i.e. 90 mm zone was obtained, while coconut, sunflower, clove and timur showed reduced bacterial growth rate i.e. 18,14,18 and 14 respectively, while Rice bran oil, olive oil, menthol and Mulethi showed anti-bacterial activity but in slowed down the bacterial growth kinetics in significant way. The free radical scavenging activity DPPH was done. The percent inhibition was calculated for oil, gel and paste. The percentage inhibition obtained was 22.53% in all 3 formulations. From DPPH assay the IC₅₀ was calculated for all 3 formulations, whose result obtained is 5.21±0.57. The biological activity was done for 3 weeks. 3 different comparisons were done. 3 persons did oil pulling, 2 people did water wash while 3 people did chlorohexadine. Water wash did not have any significant result in any weeks. In 1st week microbial count decreased in chlorohexadine, in case of oil pulling there was increase in microbial count. In 2nd week there was no micro-organism obtained in chlorohexadine while in oil pulling there was very less increase in micro-organism in compared to 1st week. While in 3rd week there was no micro-organism observed in chlorohexadine and there was drastic decrease in micro-organisms in oil pulling. By this we can say that in initial days there was removal of plaque in oil pulling and as days passed there was removal of plaque so micro-organisms decreased as days passed. Hence the hypothesis of oil pulling in removal of plaque is true.

Unlike some so-called natural home remedies, it's not a practice that's based on pseudo-science. Recent studies show that oil pulling helps against gingivitis, plaque, and microorganisms that cause bad breath. How? "Most microorganisms inhabiting the mouth consist of a single cell," Emery says. "Cells are covered with a lipid, or fatty, membrane, which is the cell's skin. When these cells come into contact with oil, a fat, they naturally adhere to each other."

OIL-PULLING TIPS

Use coconut oil

While you can get the same bacteria-fighting benefits with sesame or sunflower oil, coconut oil has the added benefit of lauric acid, which is well-known for its anti-microbial agents, Emery says, making it more effective. Also, a recent study found that coconut oil may help prevent tooth decay.

Start with just 5 minutes a day

Twenty minutes of swishing is a long time, and while the longer you pull, the more bacteria you'll remove, 5 or 10 minutes will still offer some benefit. Also, if your jaw starts aching a few minutes in, slow down. "Don't work too hard," Emery says. "A gentle

swishing, pushing, and sucking the oil through the teeth is all that's required."

Don't swallow

If you find it hard not to, you likely have too much oil in your mouth, Spit it out and try again with a smaller amount. Also, don't spit it down the sink, as the oil could clog your pipes. Just discard the used oil into the nearest trash can.

Don't skip brushing and flossing

Oil pulling should never replace routine dental visits and traditional home oral care, It doesn't reverse the effects of tooth decay, but it's a great supplemental therapy.

CONFLICT OF INTEREST

Authors declare no conflicts of interest.

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