

Using Herbal Medicine for Dental Pain in Saudi Arabia: Prevalence and Knowledge Assessment

ABSTRACT

Background: The dental community has started to use natural plant properties to relieve dental pain. Besides their significant serious side effect, Herb's ingredients should be chosen wisely. However, many studies are conducted to find out the herb's information due to the lack of randomized controlled clinical trials. The aim of this study was to assess the prevalence and the knowledge of the effect of using herbal medicine for dental pain among Saudi population.

Methodology: An observational cross-sectional study was conducted in Saudi Arabia between September 2020 and October 2021. based on a structured questionnaire among Saudi populations. Structured self-administrated questionnaires in English and Arabic languages were used as a study tool. Authors collected the information using social media channels through google forms. SPSS 26 was used for data entry and data analysis.

Results: The study included 4213 participants. 25% of study sample were males and 75% were females. 51.6% aged between 20- 30 years old. 61.8% of all participants use herbs to relieve toothache (82% of them use clove or clove oil and 36% use thyme). Think herbs are safe and free from side effects in treating toothache. 8% noticed side effects or damage while using herbs to relieve dental pain (27% of them swelling, 21% sharp stomach pain, 21% hypersensitive and 17% bleeding).

Conclusion: The Saudi population show relatively good knowledge level and practice towards herbs use in dentistry. The use of herbs to relieve toothache was significantly associated with female gender, age, residence area in western region and average monthly income.

Keywords: Herbal Medicine, Dental Pain, Natural Plant.

1. INTRODUCTION

Herbal medicine or Traditional medicine (TM) is known as “complementary and alternative medicine” (CAM) in some countries. The World Health Organization (WHO) defines TM as “the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures” [1]. Herbal medicinal products are a common component of CAM [2]. The Knowledge among Arabs relies on centuries of faith, observations, and a wealth of history in medicine [3]. The dental community has started to use natural plant properties to relieve dental pain [4]. Although, the prognosis of medicinal plant could be delayed, but its healing impact is miraculous [5].

On the other hand, traditional home solutions and medical data aid from google have been used during the COVID 19 pandemic lock-downs at critical times by patients at home for emergency oral problems and dental pain relief [6]. However, there are still limitation in evidence that prove their applications and implication [4]. The history of traditional medicine can be traced back to early civilizations, which were shared with the next generation since they were a significant source of healthcare. Traditional medicine was used to cure medical problems; however, an increasing trend of TM in dentistry was performed to reduce tooth pain, oral mucosal illnesses, and periodontal inflammation [7].

According to the WHO, 80% of people throughout the world depend on their basic health needs on herbal medicine. 25 percent of medical medicinal products are derived from plants in developed countries [8]. The Prevalence of using complementary alternative medicines (CAM) increases. In 1990, this frequency of adults in the US reached 33.8% and years later to 42.1%. As far as individuals are concerned, from 1990 to 1997 [9]. Herbs have been often used to control and prevent dental diseases for decades. Herbal extracts are useful as they react inside the body with certain chemical receptors. Herbal medications have minimal adverse effects, but side effects do exist Compared with conventional drugs. The main issue and concern is the shortage of knowledge on the effects of herbal medicine on the oral cavity [10]. In the limited resources region, the prevalence of illness rate has been increased, and that is the reason why the therapeutic methods with their alternative prevention are in high demand worldwide for dental disorders that are considered safe, efficient and affordable [11]. Moreover, antibiotic resistance is a result of the frequent consumption of contemporary medications. So, alleviating or suppressing serious disorders by dietary supplements derived from herbs are progressively being integrated to maintain body and dental health [12]. Thus, the studies for substitute options continue, with natural phytochemicals obtained from plants used in traditional medicine being considered excellent substitutes for synthetic compounds [11].

Even though, before CAM product utilization for oral health, dentist consultation should be taken to decrease adverse impact and unpredictable interaction of medication, even if it has a wide range of treatments throughout the world [13]. The reason for conducting this topic is that in the field of dentistry, a favorable outcome manifestation with the herbal medicine usage [14]. compared with chemical components drug [15]. Several previous studies in dentistry about the benefit of herbal medicinal products claim that herbal products could be employed as alternative medicinal drug materials. Worldwide, mainly in regions with limited resources, an alternative and herbal remedy can be a beneficial aid to the people [14].

Besides their significant serious side effect, Herb's ingredients should be chosen wisely [2]. However, many studies are conducted to find out the herb's information due to the lack of randomized controlled clinical trials [16]. The aim of this study was to assess the prevalence and the knowledge of the effect of using herbal medicine for dental pain among Saudi population.

2. MATERIAL AND METHODS

This is an observational cross-sectional study was conducted in Saudi Arabia between September 2020 and October 2021. based on a structured questionnaire among Saudi populations. The study's population consisted of Saudi males and females using herbal medicine within the age group 20-80 years old and individuals who agree to participate in the study, from all regions of the kingdom of Saudi Arabia. Adolescence younger than 20 years old and older than 80 years old Saudi males and females, the individuals who have psychological disorders and who disagree to participate in the study were excluded. The sample dimensions were calculated with a calculator Qualtrics of 95%, a sample size of 384.

Data collection and tool:

Structured self-administrated questionnaires in English and Arabic languages was used as a study tool. Authors collected the information using social media channels through google forms. The questionnaire includes demographic features such as (age, gender, educational level and income status). However, the questions are about assessing the knowledge about herbs, the use of herbal medicine and the source of recommendation to use them. The participants asked to list any natural herbs they currently use, additional questions about systemic health and if the participant is currently diagnosed with any medical condition, and if they are using over-the-counter medication. The last part aimed at assessing the participant's knowledge about the side effects of some of the most used herbs in Saudi Arabia. This includes clove oil, ginger, garlic, and myrrh, etc.

Statistical analysis:

SPSS 26 was used for data entry and data analysis. Descriptive statistics: Categorical variables including primary variables was described using frequencies and Continuous variables for normally distributed data was described using mean and SD. Inferential statistics: Univariate analysis was conducted for categorical variable using Chi-square test to check for all the possible risk factors The prevalence was given in percentage with 95% confidence level. Tests with a P-value < 0.05 was considered significant.

3. RESULTS

According to table (1); The study included 4213 participants. 25% of study sample were males and 75% were females. 51.6% aged between 20- 30 years old. 32% of all participants were from western region in the kingdom. Only 67% had university education. 90% live in the city and 10% live in a village. 44.1% had low family income, 16.4% moderate and 16.2% had high income.

In table (2); 61.8% of all participants use herbs to relieve toothache (82% of them use clove or clove oil and 36% use thyme). During the COVID-19 ban period, herbs were used as an emergency solution to relieve dental pain by 39.6% of participants. (Figure 1)

84.2% have Relatives and friends use herbs for toothache relief. 62.8% Advise relatives and friends to use herbs to relieve toothache. 73.1% of participants reported that Level of pain or inflammation decreased after using herbs while 8.7% reported increased Level of pain or inflammation after using herbs. 54.4% of all participants Think herbs are safe and free from side effects in treating toothache. 8% noticed side effects or damage while using herbs to relieve dental pain (27% of them swelling, 21% sharp stomach pain, 21% hypersensitive and 17% bleeding).

Regarding source of information about herbal medicine, 74% reported relatives and friends as source of information, 42% old habits, 23% social media and only 1% reported dentist as source of information.

In table (3); the use of herbs to relieve toothache was significantly associated with gender, age, residence area and average monthly income.

Table 1. Sociodemographic characteristics of participants (n=4213)

Parameter	No.	Percent	
Gender	Male	1052	25.0
	Female	3161	75.0
Age	Less than 20	752	17.8
	20 - 30 years old	2176	51.6
	31 - 40 years old	620	14.7
	41 – 50 years old	459	10.9
	51 - 60 years old	175	4.2
	More than 60	31	.7
Residence area	Southern area	391	9.3
	Eastern Region	680	16.1
	The northern area	877	20.8
	Western Region	1354	32.1
	Central Region	911	21.6
Education level	uneducated	9	.2
	primary	32	.8
	Middle school	95	2.3
	secondary	1021	24.2
	university	2823	67.0
	advanced studies	233	5.5
Average monthly household income (in Saudi riyals)	less than 5000	1859	44.1
	From 5000 - 10,000	692	16.4
	from 10,000-20,000	681	16.2
	more than 20,000	981	23.3
Accommodation type	village	417	9.9
	City	3796	90.1

Table 2. Knowledge of participants of Herbal Medicine for Dental Pain among study participants (n=4213).

Parameter		No.	Percent
Use herbs to relieve toothache	Yes	2602	61.8
	No	1611	38.2
If the answer is (yes), what is it?	Clove or clove oil	2143	0.82
	time	946	0.36
	go air	146	0.05
	turmeric	86	0.03
	thyme	47	0.01
	Rinse with salt and water	2	0.00
	chamomile	112	0.04
	Peppermint oil	94	0.03
	ginger	138	0.05
	the salt	22	0.00
	the Garlic	181	0.06
	kabo	1	0.00
	smoke	1	0.00
	screw	10	0.00
	loan	4	0.00
	Other	16	0.00
Source of information about the use of herbs to relieve toothache	Relatives and family	3119	0.74
	old habits	1783	0.42
	Social media	990	0.23
	Dentists	432	0.10
	Use without any information	149	0.03
Relatives and friends use herbs for toothache relief	Yes	3548	84.2
	No	665	15.8
Advise relatives and friends to use herbs to relieve toothache	Yes	2646	62.8
	No	1567	37.2
Level of pain or inflammation decreased after using herbs	Yes	3081	73.1
	No	1132	26.9

Pain or inflammation increased after using the herbs	Yes	365	8.7
	No	3848	91.3
Co-morbidities	diabetes	4	0.04
	heart disease	63	0.01
	Digestive disorders	221	0.05
	Hypertension	158	0.03
	other	225	0.05
	nothing	3509	0.83
If yes for a previous disease, is there side effects when using herbs	Yes	97	2.3
	No	2292	54.4
Use over-the-counter (OTC) medications and natural herbs simultaneously for toothache relief	Yes	1393	33.1
	No	2820	66.9
Inform dentist when using herbs to relieve toothache	Yes	2106	50.0
	No	2107	50.0
Think herbs are safe and free from side effects in treating toothache	Yes	2293	54.4
	No	1920	45.6
Think herbs can harm dental health	Yes	1844	43.8
	No	2369	56.2
If use herbs and medicines together, noticed any side effects or damages while using herbs to relieve dental pain	Yes	337	8.0
	No	3876	92.0
If the answer is (yes), what is it?	swelling	91	0.27
	sharp stomach pain	72	0.21
	inflammation	116	0.34
	sensitive	72	0.21
	bleeding	58	0.17
	other	66	0.19
Main reason for using of herbs	the pain	3540	0.84

	output	617	0.14
	periodontal infections	1216	0.28

Figure.1 During the COVID-19 ban period, which caused the closure of dental clinics, herbs were used as an emergency solution to relieve dental pain:

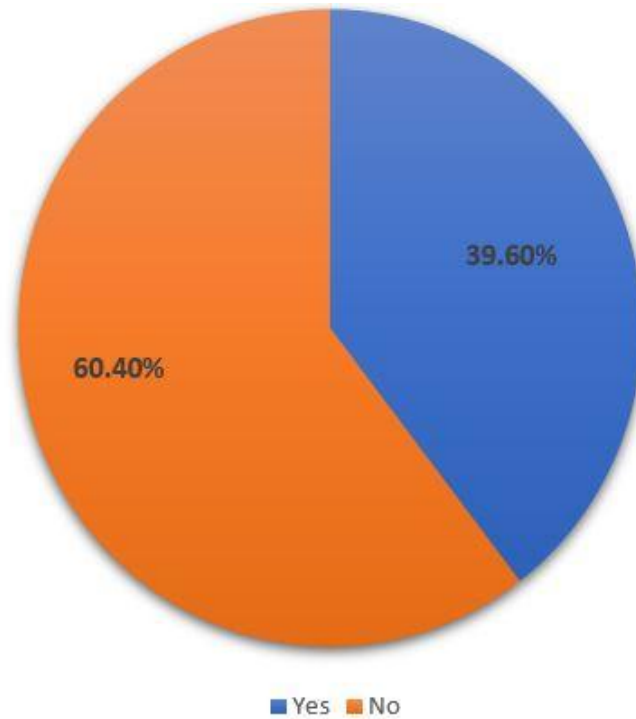


Table 3. Association between herbs use for toothache with sociodemographic characters of participants (n= 4213)

Variables		Using herbs to relieve toothache		Total (N=4213)	P value
		Yes	No		
Gender	Male	554	498	1052	0.001
		21.3%	30.9%	25.0%	
	Female	2048	1113	3161	
		78.7%	69.1%	75.0%	
Age	Less than 20	436	316	752	0.001
		16.8%	19.6%	17.8%	
	20 - 30 years old	1225	951	2176	
		47.1%	59.0%	51.6%	
	31 - 40 years old	455	165	620	
		17.5%	10.2%	14.7%	
	41 – 50 years old	336	123	459	
		12.9%	7.6%	10.9%	
	51 - 60 years old	121	54	175	
		4.7%	3.4%	4.2%	
	More than 60	29	2	31	
		1.1%	0.1%	0.7%	
Residence area	Southern area	259	132	391	0.001
		10.0%	8.2%	9.3%	
	Eastern Region	325	355	680	
		12.5%	22.0%	16.1%	
	The northern area	596	281	877	
		22.9%	17.4%	20.8%	
	Western Region	884	470	1354	
		34.0%	29.2%	32.1%	
	Central Region	538	373	911	
		20.7%	23.2%	21.6%	
Accommodation type	village	283	134	417	0.007
		10.9%	8.3%	9.9%	
	City	2319	1477	3796	
				90.1%	

Education level	uneducated	8	1	9	0.006
		0.3%	0.1%	0.2%	
	primary	23	9	32	
		0.9%	0.6%	0.8%	
	Middle school	72	23	95	
		2.8%	1.4%	2.3%	
	secondary	610	411	1021	
		23.4%	25.5%	24.2%	
	university	1734	1089	2823	
		66.6%	67.6%	67.0%	
advanced studies	155	78	233		
	6.0%	4.8%	5.5%		
Average monthly household income (in Saudi riyals)	less than 5000	1130	729	1859	0.001
		43.4%	45.3%	44.1%	
	From 5000 - 10,000	667	314	981	
		25.6%	19.5%	23.3%	
	from 10,000- 15,000	422	259	681	
		16.2%	16.1%	16.2%	
	more than 15,000	309	383	692	
		19.2%	14.7%	16.4%	

4. DISCUSSION:

Dental health is linked to a higher standard of living that goes beyond the functions of the craniofacial complex. Systemic circumstances have the potential to affect the relationship between biofilm and the inflammatory response, as well as the progression and severity of periodontal disease. The unhealthy teeth may eventually be lost as a result of this procedure [17, 18].

Herbal medicine with medical properties has been used for an extended period to prevent and treat various diseases of dental disease. Herbal medicine is useful in preventing cavity, toothache, gingivitis, mouth ulcers, swollen tonsil, oral thrush and hairy tongue [19]. The natural photochemical might be a viable alternative to antibiotics, as well as a potential strategy for preventing and treating numerous oral infections. Herbal medicines offer an advantage over conventional antibiotics, which have a low benefit to high danger ratio compared to herbal therapies, which have a high benefit to low-risk ratio [20].

Herbal extracts are useful because they interact with certain chemical receptors in the body and, in a pharmacodynamic sense, are medications in their own right. Their potency might

vary. As a result, while picking herbs, attention must be given to examine the effect of herbs on oral tissues, the mechanism of action, and side effects [21].

Several herbal formulations have been shown in the literature to have the ability to regulate the generation of proinflammatory mediators, hence controlling several inflammatory processes. Herbal anti-inflammatory compositions were proven to be safer than chemical anti-inflammatory medications when used for a longer length of time [22]. In our study, 61.8% of all participants use herbs to relieve toothache (82% of them use clove or clove oil and 36% use thyme). 73.1% of participants reported that Level of pain or inflammation decreased after using herbs while 8.7% reported increased Level of pain or inflammation after using herbs. In India, more than 70% of the population uses herbal drugs and this constitutes mostly the rural population who depends solely upon herbal-based products [23].

Antibacterial, antimycosal, and antiviral activities are found in a few plants used as nutritional supplements and as a therapeutic method in dentistry. Herbal medications, when administered in suitable quantities, do not disrupt or change the natural flora. Herbal derivatives are a common ingredient in toothpastes because of their antibacterial qualities, which help to prevent plaque development and bacterial adhesion to the pellicle [24].

Plants like miswak have been utilized as chewing sticks in numerous civilizations throughout the world under various names. Other plant components, such as eucalyptus leaves, are used to mask undesirable mouth odors in the mouth; onion and lime juices are used as gargles and to treat toothache [25]. Aerosols, gels, different mouth-rinsing solutions, and medicaments such as infusions or decoctions are some of the additional dental therapy treatments that utilize the anti-inflammatory and antibacterial capabilities of the herbal components [26].

5. CONCLUSION

The Saudi population show relatively good knowledge level and practice towards herbs use in dentistry. The use of herbs to relieve toothache was significantly associated with female gender, age, residence area in western region and average monthly income. It is important for the health of consumers to scientifically demonstrate the real effects of natural medicine, as well as clarify and establish their possible therapeutic applications.

LIMITATIONS OF THE STUDY

The main limitation of the study was lack of previous studies with similar or relative objective to compare our results along with.

CONSENT

Informed consent was obtained from all Participants included in the study.

FUNDING

This study has not received any external funding.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interests.

Data And Materials Availability

All data associated with this study are presented in the paper.

REFERENCES

1. Sagar S, Ganapathy DM, Thangavelu L. Knowledge and perception of the usage of alternative medicine in general dental practice among dental practitioners. 2020;14(3):323–5.
2. Taheri JB, Azimi S, Rafieian N, Akhavan Zanjani H. Herbs in dentistry. Vol. 61, International Dental Journal. 2011. p. 287–96.
3. Perception, Attitudes and Knowledge among Medical, Dental, Pharmacy and Nursing Students towards the Use of Herbal Medicine in Iraq Perception, Attitudes and Knowledge among Medical, Dental, Pharmacy and Nursing Students towards the Use of Herbal Me. 2018;(January):16–35.
4. Martínez CC, Gómez MD, Oh MS. Use of traditional herbal medicine as an alternative in dental treatment in mexican dentistry: A review. Pharm Biol [Internet]. 2017;55(1):1992–8. Available from: <https://doi.org/10.1080/13880209.2017.1347188>
5. Kabra P, Loomba K, Kabra SK, Sadan D, Majumdar P, Kumar N. Avenues for rehabilitation of auricular defect View project Ozone dentistry View project Medicinal Plants in the Treatment of Dental Caries [Internet]. Vol. 2, Asian Journal of Oral Health & Allied Sciences. Available from: <https://www.researchgate.net/publication/299223424>
6. Chopra S, Bansal P, Bansal P. Journal of Advanced Medical and Dental Sciences Research [Vol. 8|Issue 1]. J Adv Med Dent Scie Res [Internet]. 2020;8(1):184–6. Available from: www.jamdsr.com
7. Ren L-L, Wang Y-M, Wu Z-Q, Xiang Z-C, Guo L, Xu T, et al. Identification of a novel coronavirus causing severe pneumonia in human: a descriptive study. Chin Med J (Engl). 2020 May;133(9):1015–24.
8. Emerging trends of herbal care in dentistry. Vol. 7. 2013. p. 1827–9.
9. Simpson De Paula J, Marques De Resende A, Mialhe FL. Factors associated with the use of herbal medicines for oral problems by patients attending the clinics of the School of Dentistry, Federal University of Juiz de Fora, Brazil. Vol. 11, Original Article Braz J Oral Sci.

10. Herbs: A Good Alternatives to Current Treatments for Oral Health Problems. *Int J Adv Heal Sci @BULLE*. 2015;1(12):26–32.
11. Henley-Smith CJ, Lall N, Botha FS, Lall N. The use of plants against oral pathogens Biological activity of selected plants and their mechanism of action against *Streptococcus mutans* View project Salmonella in eggs/poultry View project Foundation for Professional Development The use of plants again [Internet]. 2013. Available from: <https://www.researchgate.net/publication/260883858>
12. Eid Abdelmagyd HA, Ram Shetty DS, Musa Musleh Al-Ahmari DM. Herbal medicine as adjunct in periodontal therapies- A review of clinical trials in past decade. *J Oral Biol Craniofacial Res* [Internet]. 2019;9(3):212–7. Available from: <https://doi.org/10.1016/j.jobcr.2019.05.001>
13. Janakiram C, Venkitachalam R, Fontelo P, Iafolla TJ, Dye BA. Effectiveness of herbal oral care products in reducing dental plaque & gingivitis - a systematic review and meta- analysis. *BMC Complement Med Ther*. 2020;20(1):43.
14. Moghadam ET, Yazdaniyan M, Tahmasebi E, Tebyanian H, Ranjbar R, Yazdaniyan A, et al. Current herbal medicine as an alternative treatment in dentistry: In vitro, in vivo and clinical studies. *Eur J Pharmacol* [Internet]. 2020;889(October):173665. Available from: <https://doi.org/10.1016/j.ejphar.2020.173665>
15. Karadaglioglu OI, Alagoz LG. Herbal Products Against Dental Caries. *Ann Dent Spec*. 2020;8(4):55–61.
16. Jena S, Kumar G, Singh D, Sethi A. Herbs used in dentistry: Need of the new era. *J Prim Care Dent Oral Heal*. 2021;2(1):11.
17. Cruz Martínez C, Diaz Gómez M, Oh MS. Use of traditional herbal medicine as an alternative in dental treatment in Mexican dentistry: a review. *Pharm Biol*. 2017;55(1):1992-1998. doi:10.1080/13880209.2017.1347188
18. Ekor M. The growing use of herbal medicines: issues relating to adverse reactions and challenges in monitoring safety. *Front Pharmacol*. 2014;4:177. Published 2014 Jan 10. doi:10.3389/fphar.2013.00177
19. Wahengbam PP, Kshetrimayum N, Wahengbam BS, Nandkeoliar T, Lyngdoh D. Assessment of Oral Health Knowledge, Attitude and Self-Care Practice Among Adolescents - A State Wide Cross- Sectional Study in Manipur, North Eastern India. *J Clin Diagn Res*. 2016;10(6):ZC65-ZC70. doi:10.7860/JCDR/2016/20693.8002
20. Moghadam, E. T., Yazdaniyan, M., Tahmasebi, E., Tebyanian, H., Ranjbar, R., Yazdaniyan, A., Seifalian, A., & Tafazoli, A. (2020). Current herbal medicine as an alternative treatment in dentistry: In vitro, in vivo and clinical studies. *European journal of pharmacology*, 889, 173665. <https://doi.org/10.1016/j.ejphar.2020.173665>
21. Taheri JB, Azimi S, Rafieian N, Akhavan Zanjani H. Herbs in dentistry. *Int Dent J*. 2011;61:287–96.
22. Seal M, Rishi R, Satish G, Divya KT, Talukdar P, Maniyar R. Herbal panacea: The need for today in dentistry. *J Int Soc Prev Community Dent*. 2016;6(2):105-109. doi:10.4103/2231-0762.178744

23. Kumarswamy A. Multimodal management of dental pain with focus on alternative medicine: A novel herbal dental gel. *Contemp Clin Dent.* 2016;7(2):131-139. doi:10.4103/0976-237X.183066
24. Guo J, Low KS, Mei L, Li JH, Qu W, Guan G. Use of traditional medicine for dental care by different ethnic groups in New Zealand. *BMC Oral Health.* 2020;20(1):280. Published 2020 Oct 12. doi:10.1186/s12903-020-01272-7
25. Hamed S, Sadeghpour O, Shamsardekani MR, Amin G, Hajighasemali D, Feyzabadi Z. The most common herbs to cure the most common oral disease: stomatitis recurrent aphthous ulcer (RAU) Iran Red Crescent Med J. 2016;18(2):e21694.
26. Seal M, Rishi R, Satish G, Divya KT, Talukdar P, Maniyar R. Herbal panacea: The need for today in dentistry. *J Int Soc Prev Community Dent.* 2016;6(2):105-109. doi:10.4103/2231-0762.178744

UNDER PEER REVIEW