

# Assessment of knowledge, attitude, and practice toward use of herbal medicine in endodontics among dentists in Chennai

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## ABSTRACT

**Background:** Endodontic treatment aims complete disinfection of entire root canal system. Herbal medicines are the emerging trend in endodontic treatment. The knowledge and understanding of natural approach of the treatments among dental practitioners are still questionable. In this context, the present study was undertaken among dentists in Chennai to assess their knowledge and attitude toward the use of herbal products in endodontics. **Aim:** The study aims to assess the knowledge, attitude, and practices (KAPs) toward the use of herbal medicine in endodontics among dentists in Chennai. **Materials and Methods:** A detailed performed validated questionnaire having both open-ended and close-ended questions to assess KAPs was given to 108 dentists in Chennai chosen randomly. The results from the questionnaire are to be evaluated statistically. **Results:** The mean knowledge scores for endodontists and general practitioners were  $20.6 \pm 2.62$  and  $2.80 \pm 5.66$ ; the mean attitude scores were  $1.47 \pm 0.5$  and  $1.09 \pm 0.64$ ; and the mean practice score was  $2.14 \pm 1.05$  and  $1.3 \pm 0.92$ , respectively. A statistically significant correlation was found between the knowledge and practice score (0.000) and knowledge and attitude score (0.000). **Conclusion:** The overall KAP of the sample population representing the dentists in Chennai toward the use of herbal products in endodontics is not satisfactory. Endodontists had better knowledge about herbal medicine compared to general practitioners.

**KEY WORDS:** Endodontics, Herbal medicine, Herbal products, Herbs in endodontics, Knowledge; attitude; and practice survey

## INTRODUCTION

The World Health Organization defines herbal medicines as “finished, labeled medicinal products that contain aerial or underground plant parts, or other plant material, or combinations thereof, whether in the crude state or as plant preparations as active ingredients. Plant material includes juices, gums, fatty oils, essential oils, and any other substances of this nature. In addition to the active ingredients, herbal medicines may contain excipients. Medicines incorporating plant substances combined with chemically defined active substances, including chemically defined and isolated constituents of plants, are not considered to be herbal medicines.”<sup>[1]</sup>

At present, the herbal products have become more popular due to their high antimicrobial activity, biocompatibility, anti-inflammatory, and antioxidant properties.<sup>[2]</sup>

Endodontic treatment aims in complete disinfection of root canal system. *Enterococcus faecalis* is the most common bacteria responsible for root canal treatment failure cases.<sup>[3]</sup> Sodium hypochlorite is used to eliminate *E. faecalis* from the root canal, but there are several disadvantages of sodium hypochlorite such as unpleasant taste, toxicity, and potential weakening of the tooth structure by decreasing the hardness and structural integrity of the dentin within the root canal.<sup>[4]</sup> Most widely used intracanal medicament, calcium hydroxide, causes weakening of root dentin by 23–43.9% following root canal treatment.<sup>[5]</sup>

In endodontics, herbs are mainly used for the disinfection of the root canal. There is increased

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research toward the herbal irrigants due to the adverse effects of the most of synthetic intracanal medicaments. Literature has addressed many plants with a potential source of new therapies in endodontics. The main advantages of using herbal alternatives are easy availability, cost-effectiveness, increased shelf life, low toxicity, and lack of microbial resistance.<sup>[6]</sup>

The knowledge and understanding of natural approach of treatments among dental practitioners are still questionable. In this context, the present study was undertaken among dentists in Chennai to assess their knowledge, attitude, and practice (KAP) toward the use of herbal products in endodontics.

## MATERIALS AND METHODS

It was a cross-sectional study conducted in Chennai, in the month of September 2017. The study population included registered dental practitioners who were willing to participate in the study and had minimum 1 year of clinical experience. Dentists with <1 year of experience of clinical practice were not included in the study.

The study was approved by the Institutional Ethics Committee of Saveetha Dental College and Hospitals. The purpose of the study was explained, and a duly filled informed consent was obtained from all the dental practitioners participating in the study.

Sample size was calculated to be 108 with a 95% level of confidence with reference to a similar previous study.<sup>[7]</sup>

A total of 108 practicing dentists in Chennai were chosen randomly and were handed over the questionnaires in person.

A structured and self-administered questionnaire was prepared (Appendix 1). Five registered endodontists accepted the 13-item questionnaire for face validity. The validity of questionnaire was established by surveying a small sample ( $n = 12$ ) of dentists other than the study population, who also fit the inclusion and exclusion criteria for the study. Each participant took the survey twice, with a gap of 1.5 weeks. Cohen's kappa coefficient was calculated to assess the reliability of each participants answer to determine if answers were consistent over time. The kappa from test-retest ranged from a low of 0.12 to 1.00, with a median coefficient of 0.47.

Demographic information of the participants such as age, gender, clinical experience, and the type of practice, that is, general practitioner or endodontist was collected. The first five questions were directed to assess the knowledge, the next four questions were for assessment of practice, and the last four questions

assessed the attitude of the participating dentists toward the use of herbal products in endodontist.

Data were entered in Microsoft Excel spreadsheet and analyzed using SPSS software (version 17). Descriptive statistics were used. For significance level,  $P < 0.05$  was considered statistically significant. Independent  $t$ -test was used for comparison between the endodontists and the general dentists.

## RESULTS

The study sample comprised of 30 endodontists (27.8%) and 78 general dentists (72.2%). 41.2% of the respondents were male. The mean age of study participants was  $35.93 \pm 8.10$ , and the mean clinical experience was  $9.63 \pm 7.60$ . The mean KAP scores for endodontists and general practitioners are tabulated in Table 1. Table 2 depicts the correlation between clinical experiences and KAP of the study population toward the use of herbal products in endodontics. A statistically significant correlation was found in between the knowledge and practice score (0.000) and knowledge and attitude score (0.000). Figure 1 shows the familiarity of dentists with various herbal products. Figures 2 and 3 show awareness about possible interactions of herbal products with conventional drugs and adverse effects of herbal products, respectively.

Scientific journals were the source of information regarding herbal products for 55.6% of the dentists, followed by advice from colleague (23.1%), media (13.9%), and college curriculum (7.4%) [Figure 4]. 23% of dentists preferred herbal products over conventional products, the reason for preference the products being natural with no side effects by 84% of them, and the products being effective by the remaining 16% [Figure 5].

## DISCUSSION

This study evaluated the KAP of dentists in Chennai toward the use of herbal medicine in endodontics. The mean knowledge score for general practitioners was  $2.80 \pm 5.66$  compared to  $20.6 \pm 2.62$  of that of endodontists. This means that endodontists have an overall better knowledge about the use of herbal products in endodontics.

Nearly 94.4% of the sample population did not know about possible interactions between herbal products and conventional drugs. Clinical reports indicate that herbal medicines can interact with conventional drugs, while the majority of such interactions may have a negligible clinical significance, some may pose a serious threat to public health.<sup>[8]</sup> For example, garlic interacts with antiplatelet and hypoglycemic drugs, *M. chamomile* potentiates anticoagulation

**Table 1: KAP scores of endodontists and general practitioners**

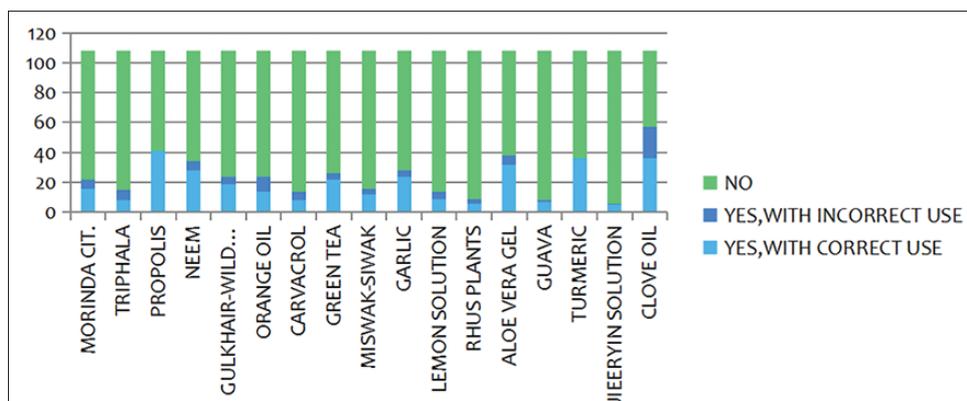
Parameter	Practice	n	Mean±SD	P-value
Knowledge	General practitioner	78	2.8077±5.65928	000
	Endodontist	30	20.6000±2.62087	000
Practice	General practitioner	78	1.3000±91539	000
	Endodontist	30	2.1410±1.05343	000
Attitude	General practitioner	78	1.0897±64839	005
	Endodontist	30	1.4667±50742	002

SD: Standard deviation, KAP: Knowledge, attitude, and practice

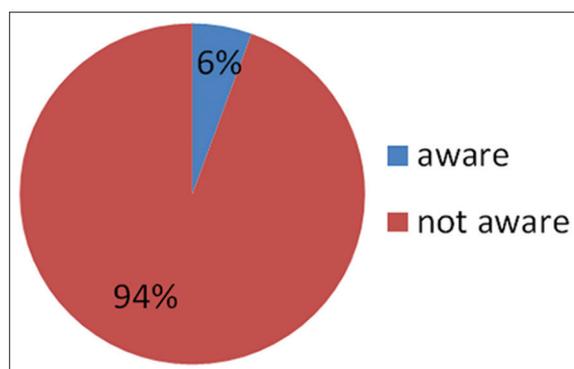
**Table 2: Correlation between clinical experience, knowledge, attitude and practice**

Parameter	Clinical experience	Knowledge	Practice	Attitude
Clinical experience				
Pearson correlation	1	-057	-008	-041
P-value		556	938	672
n	108	108	108	108
Knowledge				
Pearson correlation	-057	1	-416**	413**
P-value	556	000	000	000
n	108	108	108	108
Practice				
Pearson correlation	-008	-0.416**	1	149
P-value	938	000	123	108
n	108	108	108	108
Attitude				
Pearson correlation	-041	413**	149	1
P-value	672	000	123	108
n	108	108	108	108

\*\*Correlation is significant at the 0.01 level. KAP: Knowledge, practice, and attitude



**Figure 1:** Familiarity with various herbal products



**Figure 2:** Interactions of herbal products with conventional drugs

effects of warfarin, and green tea reduces the bioavailability of anti-cancer drugs.<sup>[9]</sup> It is mandatory for health-care professionals to be well informed about the growing clinical evidence of herb-to-drug interactions.

Nearly 87.03% of people were not aware of the adverse effects of the herbal medicines. Herbal products are usually considered safe, but literature has revealed few reports concerning the adverse effects of these natural products commonly used in endodontics. For example, aloe vera might cause abdominal cramps and diarrhea; garlic might cause bowel irritation, mouth ulceration, halitosis, and prevention of blood

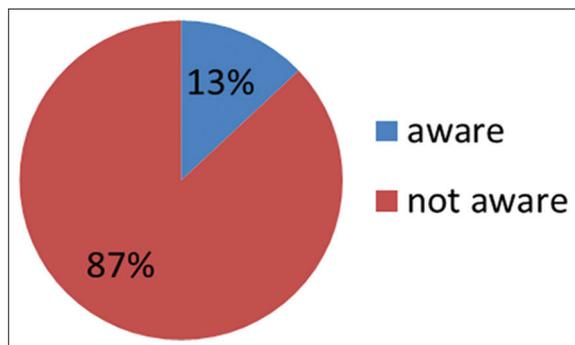


Figure 3: Adverse effects of herbal products

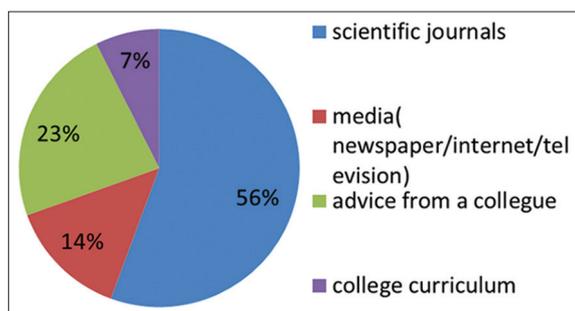


Figure 4: Source of information regarding herbal products

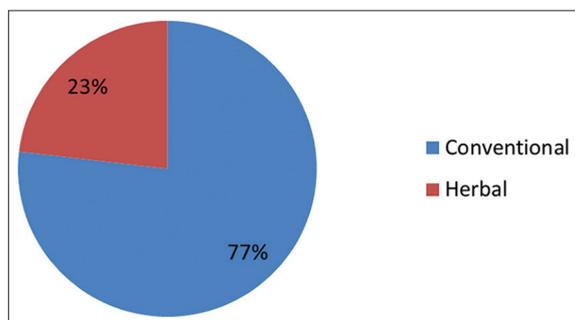


Figure 5: Preference of use

clotting; orange oil causes gastrointestinal irritation; chamomile tea conjunctivitis, etc.<sup>[9]</sup>

Clove oil, propolis, aloe vera and neem were the most common drugs that the dentists were familiar with whereas jiceryin solution, *Psidium guajava*, rhus plants and carvacrol were the least common. The major source of information regarding herbal products was from scientific journals, whereas least was from the college curriculum. This is suggestive of incorporation of herbal medicine into college curriculum to increase awareness about them.

The mean practice score for general practitioners was  $1.3 \pm 0.92$ , whereas for endodontist, it was  $2.14 \pm 1.05$  which again means endodontist use herbal products more than general practitioners. However, the overall practice score was very less. Only two dentists of 108 stated that they have used herbal product in root canal treatment. Both of them used orange oil

as gutta-percha dissolvent. Rehman *et al.* found that there is no statistically significant difference between the orange oil and chloroform when used as solvent for removing gutta-percha.<sup>[10]</sup>

Attitude scores for general practitioners and endodontist were  $1.09 \pm 0.64$  and  $1.47 \pm 0.5$ , respectively. There was no statistical difference in the attitude scores of the two groups. 23% of the population preferred herbal products over conventional products, and the most common reason for this choice was the herbal products being natural with no side effects. Only 36.1% of sample population thought herbal products to be effective in root canal treatment, whereas 82.4% of them were interested in upgrading their knowledge about the use of herbal products in endodontics.

There was no statistically significant correlation between clinical experience and KAP regarding the use of herbal products in endodontics.

There is a statistically significant positive correlation between attitude and knowledge stating that dentist with better knowledge had better attitude toward herbal medicine usage. There was a statistically significant negative correlation knowledge and practice. This shows that dentists with good knowledge are also not using herbal products in their clinical practice. This may be because the *in vitro* observations of herbal products appear promising, but preclinical and clinical trials are needed to evaluate the biocompatibility and safety factor before they can conclusively be recommended as intracanal irrigating solutions and medicaments. Herbs are generally safe if used with proper knowledge, but they can be harmful if misused. Many herbal drugs bare potential risk, side effects, and drug interactions that may affect our safe practice of dentistry. Hence, herbs should only be used for the treatment procedures that have been established to be effective and with minimal risk involved.<sup>[11]</sup>

#### Limitations of the Study

1. The survey is based on self-reported data, and thus, subjects may under or over report about their KAP about herbal medicines.
2. The method of sampling used was simple random sampling, so the study population is unevenly divided.

#### CONCLUSION

The overall KAP of the sample population representing the dentists in Chennai toward the use of herbal products in endodontics is not satisfactory. Endodontists had better knowledge about herbal medicine compared to general practitioners, but preclinical and clinical trials are needed to evaluate

the biocompatibility and safety factor before they can be incorporated into clinical practice.

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## Appendix 1

### Questionnaire

1. Are you aware of natural products that can be used in endodontics  
Yes  No
2. Are you familiar with the following products, mention yes or no next to the product, if yes please mention the use in endodontics

Product	Yes/No	Use in endodontics
a. <i>Morinda citrifolia</i> (Ashyuka - Indian Mulberry)		
b. Triphala		
c. Propolis		
d. <i>Azadirachta indica</i> (Neem)		
e. <i>Casaria sylvestris</i> (Gulkhair- Wild Coffee)		
f. Orange Oil		
g. Carvacrol		
h. Green tea		
i. <i>Salvadora persica</i> solution (Miswak-Siwak)		
j. <i>Allium sativum</i> (garlic)		
k. Lemon solution		
l. Rhus plants		
m. Aloe vera gel		
n. <i>Psidium guajava</i>		
o. Turmeric		
p. Jeeryin solution		
q. <i>Syzigium aromaticum</i> (Clove oil)		

3. Are you aware of any possible interactions of herbal products with conventional drugs  
Yes  No
4. Are you aware of any adverse effects of herbal products  
Yes  No
5. What was the source of information regarding herbal products
  - a. Scientific journals
  - b. Media (newspaper/internet/television)
  - c. Advice from a colleague
  - d. College curriculum
6. Have you ever used a herbal product in root canal treatment  
Yes  No   
If yes, name the herbal product and what was it used for  
Name-  
Use-
7. Was the treatment effective  
Yes  No
8. Any side effects observed in consequent appointment  
Yes  No   
If yes mention-
9. How frequently do you use herbal products for root canal treatment
  - a. Never
  - b. Rarely
  - c. Occasionally
  - d. Regularly
10. Preference of use
  - a. Herbal products
  - b. Conventional products
11. If preference is herbal product, reason
  - a. They are natural with no side effects
  - b. They are efficient
  - c. They are cost effective
  - d. Any other reason
12. Do you think herbal products are effective in root canal treatment  
Yes  No
13. Are you interested in updating your knowledge about the use of herbal products in endodontics  
Yes  No