

Knowledge, Attitudes, and Practices Regarding Ethnomedicinal Therapies in Oral Cancer Care: Insights from Healthcare Professionals with Reference to *Thuja occidentalis*

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ABSTRACT

Background: Oral Squamous Cell Carcinoma (OSCC) remains a major global health challenge despite advances in conventional therapies. Growing interest in Complementary and Alternative Medicine (CAM) has heightened attention to natural and plant-based therapies such as *Thuja occidentalis* (*T. occidentalis*) in oral cancer management. Healthcare professionals play an important role in guiding evidence-based use of these therapies. **Objectives:** To evaluate the Knowledge, Attitudes, and Practices (KAP) regarding *T. occidentalis* and CAM among healthcare professionals involved in oral cancer care. **Materials and Methods:** A cross-sectional questionnaire-based study was conducted among 400 healthcare practitioners in Chennai, India, including medical practitioners, dentists, Ayurvedic physicians, and homeopathic practitioners. Data were collected using a validated self-administered questionnaire assessing sociodemographic characteristics, KAP domains, and perceived barriers related to ethnomedicinal plant use in oral cancer management. Descriptive statistics and ordinal logistic regression analysis were performed using IBM SPSS Statistics version 27.0, with $p < 0.05$ considered significant. A total of 400 eligible healthcare professionals were recruited, yielding a response rate of 100%. **Results:** The mean knowledge, attitude, and practice scores were 3.16 ± 2.00 (out of 9), 32.33 ± 6.00 (out of 45), and 3.20 ± 2.50 (out of 16), respectively. Overall awareness of CAM was high (85.0%), whereas specific knowledge regarding *T. occidentalis* was limited. Only 39.0% had heard of *T. occidentalis*, while awareness of adverse effects and herb-drug interactions was reported by 24.0% and 13.0% of participants, respectively. Positive attitudes toward integrating ethnomedicinal therapies were observed, with 78.0% supporting further research. However, clinical practice remained limited, with only 10.0% recommending CAM. Knowledge, attitude, and profession were significant predictors of practice levels ($p < 0.05$), with attitude emerging as the strongest independent predictor. Lack of training and safety concerns were the major barriers reported. **Conclusion:** Despite favorable attitudes, healthcare professionals demonstrated inadequate clinically relevant knowledge and limited practice regarding *T. occidentalis* in oral cancer management. Evidence-based educational initiatives are needed to support safe integration into oncology care. Top of Form

Keywords: Attitude, Complementary Medicine, Healthcare Professionals, Knowledge, Oncology, Oral Squamous Cell Carcinoma, Practice, *T. occidentalis*, Traditional Medicine.

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INTRODUCTION

Oral cancer arising from the oral mucosal epithelium represents a significant global public health challenge, particularly in populations with high prevalence of tobacco use, alcohol

consumption, and betel quid chewing. The disease is associated with substantial functional and aesthetic impairments, including altered speech, swallowing difficulties, and loss of taste, which collectively contribute to a markedly reduced oral health-related quality of life (Tan *et al.*, 2023). OSCC constitutes the most common histological subtype and may occur across multiple anatomical sites within the oral cavity. Despite advancements in diagnostic and therapeutic modalities, survival rates remain unsatisfactory, largely due to delayed diagnosis and the aggressive biological behavior of the disease (Bugshan and Farooq, 2020).

Conventional management of oral cancer primarily involves surgery, chemotherapy, and radiotherapy. Chemotherapy plays



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a crucial role in reducing the risk of recurrence and metastasis, thereby improving survival outcomes (Liu *et al.*, 2015). However, these treatment modalities are frequently associated with considerable physical, psychological, and functional burdens (Khurshid *et al.*, 2023). Adverse effects such as mucositis, xerostomia, pain, dysphagia, and immunosuppression often negatively impact patient well-being, prompting many individuals to explore CAM approaches. Consequently, there is growing interest in integrative strategies that incorporate traditional and ethnomedicinal practices alongside standard oncologic care (Lopes *et al.*, 2023).

CAM have been utilized for centuries to prevent and manage various chronic diseases, including cancer (Reyaz *et al.*, 2025). CAM typically adopts a holistic approach, employing whole plants or herbal combinations for therapeutic purposes. Numerous plant-derived compounds exhibit antioxidant, anti-inflammatory, immunomodulatory, and antineoplastic properties, rendering them potential candidates for adjunctive cancer therapy (Imtiaz *et al.*, 2024). In the context of oral cancer, several medicinal plants have been investigated for their potential roles in symptom management, enhancing host immune responses and modulating carcinogenic pathways (Imtiaz *et al.*, 2024; Reyaz *et al.*, 2025).

In India, ethnomedicinal and traditional healthcare products are regulated under the framework of the Ministry of AYUSH (Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy), which oversees their education, research, manufacturing, and clinical application. The regulatory framework emphasizes quality assurance, standardization, safety monitoring, and the promotion of evidence-based practices for traditional medicinal products. Recent initiatives have focused on strengthening pharmacovigilance systems, improving manufacturing standards, and encouraging scientific validation of traditional therapies to facilitate their safe integration into contemporary healthcare. Despite these efforts, challenges related to clinical evidence, healthcare professional awareness, and standardized therapeutic guidelines continue to influence the acceptance and utilization of ethnomedicinal products in oncology care.

T. occidentalis, a plant widely used in CAM and homeopathy, has attracted attention due to its reported antimicrobial, antioxidant, anti-inflammatory, antidiabetic, antipyretic, and anticancer properties (Ramsridhar *et al.*, 2024). Experimental studies have suggested that extracts of *T. occidentalis* may influence immune regulation and apoptosis, however, evidence supporting its clinical effectiveness in cancer management remains limited. In addition to *T. occidentalis*, various CAM therapies are commonly employed across traditional healthcare systems. However, their scientific validation, clinical indications, and safety profiles remain insufficiently characterized (Hakobjanyan *et al.*, 2025).

Healthcare professionals play a pivotal role in guiding patients toward evidence-based treatment decisions and ensuring the safe use of complementary therapies (Alzahrani *et al.*, 2024). Their knowledge, attitudes, and clinical practices substantially influence patient counseling, acceptance of integrative approaches, and the prevention of potential drug-herb interactions. Nevertheless, limited evidence exists regarding healthcare professionals' awareness and perceptions of *T. occidentalis* and other CAM application in oral cancer management (Hernandez-Fuentes *et al.*, 2025).

T. occidentalis was selected as the representative ethnomedicinal plant in this study because of its documented medicinal properties, including antioxidant, immunomodulatory, and anticancer activities, and its emerging therapeutic relevance in OSCC (Hakobjanyan *et al.*, 2025; Ramsridhar *et al.*, 2024). Despite its growing scientific interest, evidence regarding its clinical applicability remains limited, and little is known about healthcare professionals' awareness and perceptions of its use. As healthcare professionals play a critical role in guiding evidence-based decisions regarding complementary therapies, understanding their knowledge, attitudes, and practices is essential. Therefore, the present study aimed to evaluate healthcare professionals' knowledge, attitudes, and practices regarding ethnomedicinal therapies in oral cancer care, using *T. occidentalis* as a representative example of a plant with emerging therapeutic potential.

MATERIALS AND METHODS

Study Design and Setting

A cross-sectional study was conducted among healthcare practitioners in Chennai, Tamil Nadu, India, to assess Knowledge, Attitudes, and Practices (KAP) regarding *T. occidentalis* and other CAM in the management of oral cancer. The study was conducted over a period of 6 months.

Ethical Considerations

Ethical approval was obtained from the appropriate Institutional Ethics Committee prior to commencement of the study. All participants were informed about the study objectives and procedures before participation, and written or implied informed consent was obtained.

Study Population and Eligibility Criteria

The study population included healthcare professionals, including dentists, medical practitioners, Ayurvedic physicians, and homeopathic practitioners, with at least 1 year of clinical experience. Interns, students, non-clinical professionals, and individuals who submitted incomplete questionnaires were excluded from the study.

Sample Size Determination

The sample size was calculated using the single population proportion formula ($n=4pq/d^2$), assuming a 95% confidence level ($Z=1.96$), a margin of error of 5%, and an estimated prevalence of 48% derived from pilot study findings. The minimum required sample size was 384. To account for potential non-response and incomplete data, the final sample size was increased to 400 participants. All eligible participants completed the questionnaire, and no responses were excluded from the analysis, resulting in a response rate of 100%.

Sampling Technique and Data Collection

Participants were recruited using a non-probability convenience sampling method. Healthcare practitioners were approached from government and private hospitals, academic institutions, and private clinics across Chennai. Additionally, practitioners attending professional meetings and continuing medical education programs were invited to participate. Where feasible, the questionnaire was also distributed electronically through professional networks.

Data were collected using a structured, self-administered questionnaire developed through an extensive literature review and expert consultation (see Supplementary File). The instrument comprised five sections: sociodemographic characteristics; knowledge; attitudes; practices; and perceived barriers to the use of CAM in oral cancer management.

Questionnaire Validation and Reliability

Content validity was established through expert panel evaluation by specialists in public health dentistry, oral medicine, oncology, and CAM, including Ayurvedic practitioners. Each item was assessed for relevance, clarity, representativeness, and appropriateness. Minor revisions were made based on expert feedback to improve clarity and comprehensiveness.

Face validity was assessed through a pilot test with 10 healthcare practitioners to evaluate readability and comprehensibility. Feedback indicated that the questionnaire was clear and well-structured, and necessary refinements were incorporated. Data from the pilot study were excluded from the final analysis.

Internal consistency reliability was assessed using Cronbach's alpha, which demonstrated acceptable reliability ($\alpha \geq 0.7$).

Scoring System

The KAP domains were scored as follows:

- Knowledge: Comprised 9 items, with each correct response scored as 1 and incorrect or "not sure" responses scored as 0 (total score range: 0-9).

- Attitude: Included 9 items measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with a total score range of 9-45.
- Practice: Consisted of eight items scored as "Yes" (2), "Occasionally" (1), and "No" (0), yielding a total score range of 0-16. Although the validated questionnaire included all three response options, no participant selected "Occasionally" during data collection; therefore, only the observed response categories ("Yes" and "No") are presented in the results table.
- Scores in each domain were categorized as good (>75%), moderate (50-75%), and poor (<50%).

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize participants' demographic characteristics and KAP scores. Continuous variables were expressed as mean±Standard Deviation (SD), while categorical variables were presented as frequencies and percentages.

Ordinal logistic regression analysis (proportional odds model) was employed to identify factors associated with practice levels. Independent variables included knowledge score, attitude score, profession, years of clinical experience, gender, and qualification. The proportional odds assumption was assessed before model interpretation.

Adjusted Odds Ratios (AORs) with 95% Confidence Intervals (CIs) were reported. A p-value of <0.05 was considered statistically significant.

RESULTS

Participant Characteristics

A total of 400 healthcare practitioners participated in the study. The majority were medical practitioners ($n=180$, 45.0%), followed by dentists ($n=140$, 35.0%), Ayurvedic practitioners ($n=60$, 15.0%), and homeopathic practitioners ($n=20$, 5.0%).

Most participants belonged to the 30-45-year age group ($n=260$, 65.0%), followed by 46-60 years ($n=90$, 22.5%) and 25-29 years ($n=50$, 12.5%). Female participants accounted for 60.0% ($n=240$) of the sample, whereas males constituted 40.0% ($n=160$).

Regarding professional experience, 38.0% ($n=152$) had <5 years of clinical experience, 35.0% ($n=140$) had 5-10 years, and 27.0% ($n=108$) had >10 years of experience. More than half of the participants held postgraduate qualifications ($n=220$, 55.0%), followed by undergraduate degrees ($n=140$, 35.0%) and doctoral qualifications ($n=40$, 10.0%).

In terms of practice setting, private practitioners represented the largest group ($n=180$, 45.0%), followed by mixed practice ($n=90$, 22.5%), academic practice ($n=80$, 20.0%), and government service ($n=50$, 12.5%). Nearly half of the respondents ($n=190$, 47.5%) reported prior experience in managing oral cancer patients (Figure 1).

The mean knowledge score among the participants was approximately 3.16 ± 2.00 (range: 0-9), indicating an overall low level of knowledge regarding CAM and *T. occidentalis* in oral cancer management. The mean attitude score was approximately 32.33 ± 6.00 (range: 9-45), reflecting a generally positive attitude toward the integration of ethnomedicinal therapies into oral cancer care. In contrast, the mean practice score was approximately 3.20 ± 2.50 (range: 0-16), suggesting limited implementation of CAM-related practices in routine clinical settings despite favorable attitudes.

Knowledge Regarding CAM and *T. occidentalis*

Overall awareness of CAM for oral cancer management was high, with 85.0% ($n=340$) of participants reporting familiarity with these therapies. However, specific knowledge regarding *T. occidentalis* was comparatively limited.

Only 39.0% ($n=156$) had heard of *T. occidentalis* as a medicinal plant, while 35.0% ($n=140$) were aware of its use in CAM. Awareness of its potential anticancer or immunomodulatory properties was reported by 34.0% ($n=136$).

Knowledge related to safety and evidence-based use was notably inadequate. Only 24.0% ($n=96$) were aware of potential adverse effects associated with *T. occidentalis*, and merely 13.0% ($n=52$) recognized possible herb-drug interactions. Although 36.0% ($n=144$) believed ethnomedicinal plant use should be evidence-based, only 12.0% ($n=48$) had received formal education or training in ethnomedicinal or complementary therapies (Table 1).

Values are expressed as frequency (n) and percentage (%). "No/Not sure" responses were combined for analysis.

Attitudes Toward CAM in Oral Cancer Care

Participants generally demonstrated a favorable attitude toward integrating CAM into oral cancer management.

Approximately one-third agreed that CAM could complement conventional oral cancer treatment (34.0%, $n=136$), while 33.0% ($n=132$) believed *T. occidentalis* may offer therapeutic benefits in oral cancer care.

A majority agreed that healthcare professionals should possess knowledge regarding ethnomedicinal therapies (63.0%, $n=252$), and 56.0% ($n=224$) supported regulation and standardization of ethnomedicinal practices.

Notably, 78.0% ($n=312$) agreed that further research on *T. occidentalis* in oral cancer is required, indicating strong interest in validating its therapeutic potential through scientific research (Table 2).

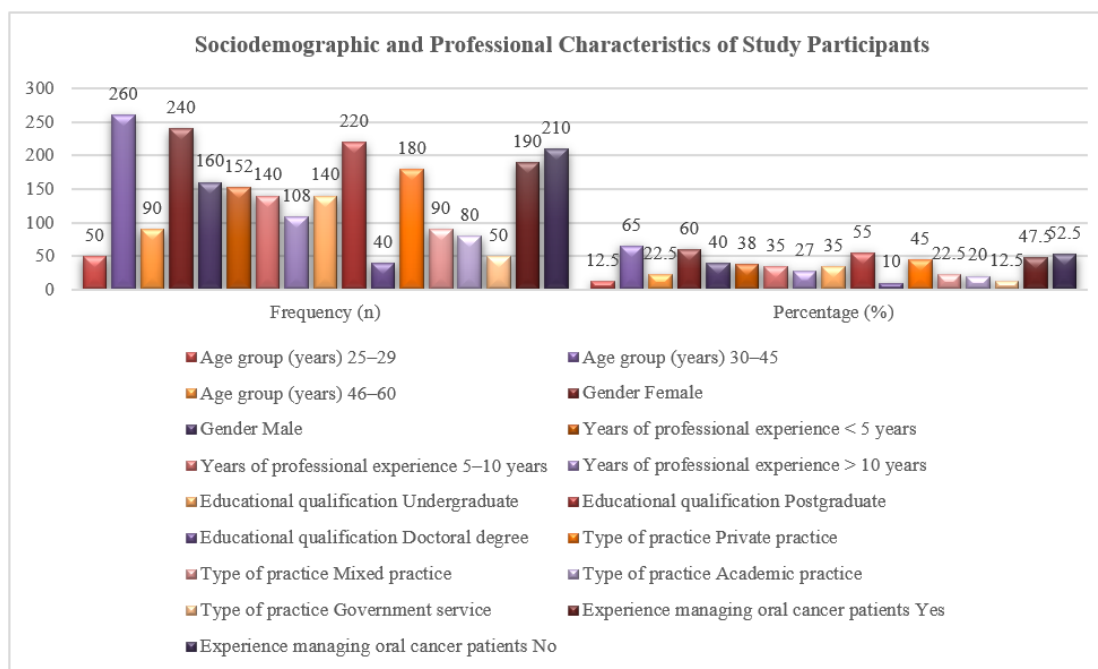


Figure 1: Sociodemographic and Professional Characteristics of the Study Participants ($n=400$). Distribution of healthcare practitioners according to age group, gender, years of professional experience, educational qualification, type of practice, and prior experience in managing oral cancer patients. Data are presented as frequencies (n) and percentages (%) of the total study population.

Values are expressed as frequency (*n*) and percentage (%). Percentages are calculated row-wise.

Practices Related to Ethnomedicinal Plant Use

Despite moderate awareness and generally positive attitudes, the clinical application of CAM was limited.

Only 10.0% (*n*=40) reported recommending CAM to patients, and just 6.0% (*n*=24) had specifically recommended *T. occidentalis* in clinical practice. Additionally, only 29.0% (*n*=116) routinely

enquired about ethnomedicinal plant use during patient history taking.

15% (*n*=60) reported observing patients concurrently using CAM alongside conventional cancer therapies, while only 11.0% (*n*=44) counseled patients regarding potential adverse effects.

Encouragingly, 57.0% (*n*=228) expressed willingness to undergo formal training on CAM in oral cancer management, indicating interest in improving competency in this area (Table 3).

Table 1: Knowledge Regarding CAM and *T. occidentalis* Among Healthcare Practitioners (*n*=400).

Sl. No.	Knowledge item	Yes <i>n</i> (%)	No / Not sure <i>n</i> (%)
1.	Awareness of CAM used in the management of oral cancer	340 (85.0)	60 (15.0)
2.	Heard of <i>T. occidentalis</i> as a medicinal plant	156 (39.0)	244 (61.0)
3.	Awareness that <i>T. occidentalis</i> is used in CAM	140 (35.0)	260 (65.0)
4.	Awareness of the proposed anticancer or immunomodulatory properties of <i>T. occidentalis</i>	136 (34.0)	264 (66.0)
5.	Belief that CAM can play a role as adjuncts in oral cancer management	152 (38.0)	248 (62.0)
6.	Awareness of possible adverse effects associated with <i>T. occidentalis</i> use	96 (24.0)	304 (76.0)
7.	Awareness of potential herb-drug interactions involving CAM	52 (13.0)	348 (87.0)
8.	Belief that CAM use should be evidence-based	144 (36.0)	256 (64.0)
9.	Received formal education or training regarding CAM	48 (12.0)	352 (88.0)

Table 2: Distribution of Attitude Responses Towards CAM and *T. occidentalis* in Oral Cancer Management (*n*=400).

Sl. No.	Attitude statement	Strongly Disagree <i>n</i> (%)	Disagree <i>n</i> (%)	Neutral <i>n</i> (%)	Agree <i>n</i> (%)	Strongly Agree <i>n</i> (%)
1.	CAM can complement conventional oral cancer treatment	24 (6.0)	40 (10.0)	120 (30.0)	136 (34.0)	80 (20.0)
2.	<i>T. occidentalis</i> may have potential benefits in oral cancer management	28 (7.0)	48 (12.0)	112 (28.0)	132 (33.0)	80 (20.0)
3.	Integration of ethnomedicine into cancer care should be encouraged	20 (5.0)	36 (9.0)	108 (27.0)	136 (34.0)	100 (25.0)
4.	Healthcare professionals should be knowledgeable about ethnomedicinal therapies	8 (2.0)	20 (5.0)	80 (20.0)	252 (63.0)	40 (10.0)
5.	Counseling patients on ethnomedicinal plant use is part of a healthcare professional's responsibility	48 (12.0)	96 (24.0)	96 (24.0)	64 (16.0)	96 (24.0)
6.	Lack of scientific evidence limits the use of CAM in clinical practice	20 (5.0)	40 (10.0)	96 (24.0)	184 (46.0)	60 (15.0)
7.	Ethnomedicinal therapies should be regulated and standardized	12 (3.0)	28 (7.0)	80 (20.0)	224 (56.0)	56 (14.0)
8.	Multidisciplinary collaboration is needed to integrate ethnomedicine into oncology care	16 (4.0)	32 (8.0)	100 (25.0)	172 (43.0)	80 (20.0)
9.	More research is needed on <i>T. occidentalis</i> in oral cancer	4 (1.0)	12 (3.0)	48 (12.0)	312 (78.0)	24 (6.0)

Perceived Barriers to Ethnomedicinal Plant Use

The most frequently reported barrier to integrating CAM into oral cancer management was a lack of training (35.0%, $n=140$), followed by safety concerns (30.0%, $n=120$) and insufficient scientific evidence (20.0%, $n=80$).

Legal and ethical concerns (10.0%, $n=40$) and patient noncompliance (5.0%, $n=20$) were less frequently reported (Figure 2).

Factors Associated with Practice Levels

Ordinal logistic regression analysis was performed to identify predictors of practice levels among healthcare practitioners. The overall model was statistically significant ($\chi^2=196.664$, $p<0.001$), demonstrating acceptable model fit (Deviance $p=0.998$) and moderate explanatory power (Nagelkerke $R^2=0.465$).

Knowledge, attitude, and profession were identified as significant predictors of practice levels.

Participants with poor knowledge demonstrated significantly lower odds of good practice than those with good knowledge (OR=0.23, 95% CI: 0.08-0.67, $p=0.007$). Similarly, participants with moderate knowledge also had reduced odds of good practice (OR=0.31, 95% CI: 0.17-0.58, $p<0.001$).

Regression analysis identified attitude as the strongest independent predictor of practice. Compared with participants with a positive attitude, those with a negative attitude had significantly lower odds of good practice (OR=0.07, 95% CI: 0.01-0.32, $p=0.001$),

while those with a neutral attitude also demonstrated significantly lower odds (OR = 0.53, 95% CI: 0.29-0.95, $p=0.035$).

Among professions, dentists had significantly lower odds of good practice than homeopathic practitioners (OR=0.08, 95% CI: 0.03-0.21, $p<0.001$). No statistically significant associations were observed for years of experience, gender, or qualification ($p>0.05$).

Age was excluded from interpretation due to instability arising from sparse observations in higher age categories (Table 4).

Model Summary: Chi-square- 196.664; p value<0.001; Nagelkerke R^2 -0.465; Deviance p value- 0.998.

DISCUSSION

The present study demonstrated that knowledge, attitude, and profession were significant predictors of practice, highlighting the important role of cognitive and perceptual factors in the adoption of ethnomedicine in oral cancer care. These findings are consistent with previous studies showing that knowledge and perceptions significantly influence the integration of Complementary and Alternative Medicine (CAM) into clinical practice (Ammar *et al.*, 2023; Barikani *et al.*, 2015).

A significant association was observed between knowledge and practice, with participants possessing lower levels of knowledge being less likely to engage in appropriate clinical practices related to ethnomedicinal therapies. Similar findings have been reported among healthcare professionals, where awareness of CAM did not necessarily translate into its clinical recommendation or use

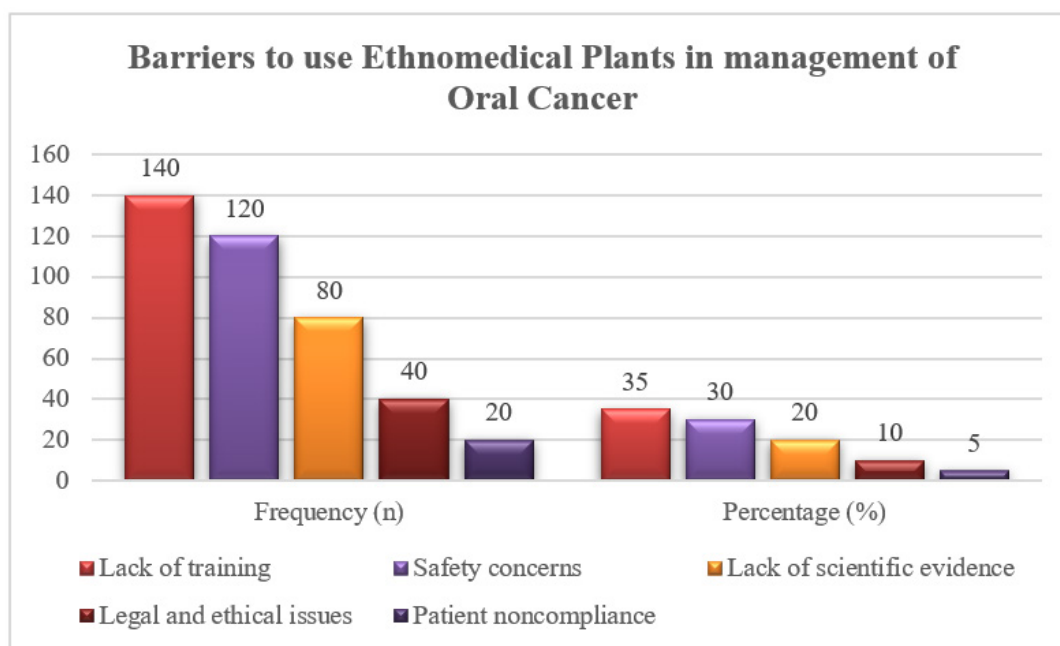


Figure 2: Perceived Barriers to the Use of CAM in Oral Cancer Management Among Healthcare Practitioners ($n=400$). The figure illustrates the frequency (n) and percentage (%) distribution of barriers reported by participants regarding the integration of CAM into oral cancer care. The most commonly identified barriers included lack of training, safety concerns, insufficient scientific evidence, legal and ethical issues, and patient noncompliance.

(Bahall and Legall, 2017; Kong *et al.*, 2013). Previous studies have suggested that insufficient understanding of the safety, efficacy, and clinical applications of CAM remains a major barrier to its integration into routine healthcare practice (Jafari *et al.*, 2021; Liu *et al.*, 2021; Sundaramurthy *et al.*, 2016).

Attitude emerged as the strongest predictor of practice, influencing healthcare professionals' willingness to discuss and recommend CAM therapies. This observation is consistent with findings indicating that practitioners' perceptions of efficacy, safety, and scientific validity strongly shape their readiness to incorporate

CAM into patient care (Hyodo *et al.*, 2003; Shashikumar *et al.*, Sont *et al.*, 2023; Trimborm *et al.*, 2013).

Significant differences were also identified across professional groups, with dentists demonstrating lower levels of practice compared with homeopathy practitioners. This finding aligns with previous reports suggesting that conventional healthcare professionals tend to be more cautious regarding CAM integration than practitioners from traditional systems of medicine (Liu *et al.*, 2021; Stub *et al.*, 2016). Although ethnomedicinal therapies are widely accepted in India because of their cultural relevance, accessibility, and longstanding traditional use, their incorporation

Table 3: Practices of Healthcare Professionals Regarding CAM and *T. Occidentalis* in Oral Cancer Management (n=400).

Sl. No.	Practice item	Yes n (%)	No n (%)
1.	Ever recommended CAM to patients	40 (10.0)	360 (90.0)
2.	Specifically recommended <i>T. occidentalis</i> in any clinical context	24 (6.0)	376 (94.0)
3.	Patients ask about CAM for oral cancer	52 (13.0)	348 (87.0)
4.	Inquire about CAM use during patient history taking	116 (29.0)	284 (71.0)
5.	Observed patients using CAM alongside conventional cancer therapy	60 (15.0)	340 (85.0)
6.	Caution patients about the possible side effects of CAM	44 (11.0)	356 (89.0)
7.	Attended workshops or seminars on CAM	76 (19.0)	324 (81.0)
8.	Willing to receive formal training on CAM in oral cancer management	228 (57.0)	172 (43.0)

Values are expressed as frequency (n) and percentage (%). Percentages are calculated row-wise. Note: Although the validated questionnaire included the response options 'Yes', 'Occasionally', and 'No', no respondents selected the 'Occasionally' option during data collection. Therefore, only the observed response categories ('Yes' and 'No') are presented.

Table 4: Ordinal Logistic Regression Analysis for Factors Associated with Practice.

Variable	Category	β (Estimate)	SE	OR (Exp β)	95% CI for OR	p-value
Experience	<5 years	-0.631	0.368	0.53	0.26 - 1.09	0.086
	5-10 years	0.163	0.346	1.18	0.60 - 2.32	0.638
	>10 years	Reference	-	1.00	-	-
Knowledge	Poor	-1.482	0.554	0.23	0.08 - 0.67	0.007*
	Moderate	-1.164	0.315	0.31	0.17 - 0.58	<0.001*
	Good	Reference	-	1.00	-	-
Attitude	Negative	-2.714	0.809	0.07	0.01 - 0.32	0.001*
	Neutral	-0.640	0.303	0.53	0.29 - 0.95	0.035*
	Positive	Reference	-	1.00	-	-
Profession	Medical	-0.651	0.372	0.52	0.25 - 1.08	0.080
	Dentist	-2.587	0.520	0.08	0.03 - 0.21	<0.001*
	Ayurvedic	-0.324	0.344	0.72	0.37 - 1.42	0.346
	Homeopathy	Reference	-	1.00	-	-
Gender	Male	-0.052	0.274	0.95	0.55 - 1.63	0.850
	Female	Reference	-	1.00	-	-
Qualification	UG	0.491	0.461	1.64	0.66 - 4.03	0.286
	PG	-0.549	0.388	0.58	0.27 - 1.24	0.157
	PhD	Reference	-	1.00	-	-

into formal healthcare settings remains limited (Gawde *et al.*, 2013; Khapre and Saxena, 2018; Kshirsagar *et al.*, 2020).

No significant association was observed between demographic variables and practice, indicating that clinical behaviour is influenced more by knowledge and professional attitudes than by age, gender, or years of experience. Collectively, these findings underscore the need to strengthen evidence-based education and foster positive professional attitudes to support the safe and effective integration of ethnomedicinal therapies into oral cancer care.

STRENGTHS AND LIMITATIONS OF THE STUDY

This study has several notable strengths. To the best of our knowledge, few studies have specifically evaluated knowledge, attitudes, and practices related to *T. occidentalis* and other CAM techniques within a multidisciplinary cohort of healthcare professionals, encompassing both conventional and traditional systems of medicine. The inclusion of diverse professional groups and practice settings enhances the external relevance and contextual applicability of the findings. Additionally, the relatively large sample size, structured recruitment approach, and use of a validated questionnaire with acceptable internal consistency contribute to the methodological rigor and reliability of the study outcomes.

However, certain limitations should be acknowledged. The cross-sectional design restricts the ability to establish causal relationships or assess temporal changes in knowledge and practice. The use of non-probability convenience sampling may introduce selection bias and limit the generalisability of the findings. Furthermore, reliance on self-reported data may be subject to recall and social desirability biases, particularly regarding reported clinical practices. Future studies employing longitudinal designs, probability-based sampling, and objective assessment methods are warranted to strengthen the evidence base.

CONCLUSION

This study identified a significant knowledge-practice gap regarding *T. occidentalis* and CAM among healthcare professionals involved in oral cancer care. Despite generally positive attitudes toward CAM, limited knowledge, inadequate training, and safety concerns restricted its clinical application. Knowledge, attitude, and profession emerged as significant predictors of practice. These findings underscore the need for evidence-based education and targeted training initiatives to improve healthcare professionals' understanding of CAM and facilitate informed clinical discussions regarding its use in oral cancer care.

ACKNOWLEDGEMENT

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ABBREVIATIONS

AOR: Adjusted Odds Ratio; **CAM:** Complementary and Alternative Medicine; **CI:** Confidence Interval; **KAP:** Knowledge, Attitudes, and Practices; **OR:** Odds Ratio; **OSCC:** Oral Squamous Cell Carcinoma; **PG:** Postgraduate; **SD:** Standard Deviation; **SPSS:** Statistical Package for the Social Sciences; **UG:** Undergraduate.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORS CONTRIBUTION

S.R. conceptualized and designed the study, performed formal analysis, and wrote the original manuscript draft; **C.R. and V.P.V.** contributed to methodology development, data collection, and manuscript review; **K.M. and M.A.H.** participated in investigation, validation, and data interpretation; **M.B.** supervised the study, contributed to methodology and critical revision of the manuscript. All authors reviewed and approved the final manuscript.

SUMMARY

This cross-sectional study evaluated the knowledge, attitudes, and practices of 400 healthcare practitioners in Chennai, India, regarding the use of and other CAM practice in oral cancer care. While overall awareness and attitudes toward integrating these therapies were positive, specific clinical knowledge and practical implementation remained highly limited due to a lack of formal training and safety concerns. The findings highlight the critical need to bridge this knowledge-practice gap by integrating evidence-based education on complementary therapies into standard oncology and medical curricula.

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