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Original Article

Insights into Early Identification of Oral Potentially Malignant Disorders and Oral Cancer: A Cross-Sectional KAP Study among Dentists

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ABSTRACT

Background: Oral cancer, including malignancies of the oral cavity and associated structures, poses a significant global health challenge. Early identification is crucial for improving treatment outcomes and survival rates. **Materials and Methods:** This study evaluated the Knowledge, Attitudes and Practices (KAP) of dental professionals in Hyderabad, Telangana, regarding the early detection of oral premalignancies and oral cancer. A cross-sectional study was conducted among 384 dental professionals using a 24-item questionnaire covering demographics, knowledge, attitude and practice components. Data collection took place in dental clinics and statistical analyses were performed using descriptive statistics, frequency distribution and Chi-square tests, with $p<0.05$ considered significant. **Results:** Among 384 surveyed professionals, 67% demonstrated commendable knowledge, 81% had a positive attitude and 58% engaged regularly in screening and diagnosing oral cancers. Professionals over 35 years scored higher in practice-related aspects, yet only 42.4% were familiar with using screening devices and 29.8% routinely performed diagnostic activities. While knowledge and attitudes were generally favorable, practical implementation, especially among younger dentists, needs improvement. **Conclusion:** The findings emphasize the need for targeted training and educational programs to enhance practical skills, including the use of diagnostic tools. Integrating oral cancer education into dental curricula may further encourage proactive attitudes and practices, improving early detection and patient outcomes.

Keywords: Dental Professionals, Early Detection, Oral Cancer, Premalignant Lesions, Screening Devices.

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INTRODUCTION

The battle against cancer remains a perpetual and multifaceted challenge in modern healthcare. Oral cancer is a significant concern among the various varieties of this insidious disease due to its apparent impact on human lives and public health systems and the increasing prevalence of the disease (Rupel *et al*., 2023). The term "oral cancer" encompasses a diverse array of the malignancies that occur within the oral cavity, including the lips, tongue, floor of the mouth, palate, gums and salivary glands. The potential fatality and the impact on essential functions, such as articulation, swallowing and mastication, are indicative of the severity of this illness, which are all critical to an individual's quality of life (Rupel *et al*., 2023; Shimpi *et al*., 2018). Buccal cancer, which includes malignancies of the buccal cavity and associated structures, has become a substantial global public health issue. Its frequency has considerably increased in both industrialised and developing countries over the past few decades (Shimpi *et al*., 2018). According to the World Health Organisation (WHO), oral cancer is estimated to be responsible for approximately 3% of all malignancies worldwide, with over 354,000 new cases documented annually. Over 177,000 fatalities

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are annually attributable to oral cancer, which is associated with a substantial morbidity and mortality rate. Furthermore, oral cancer imposes a substantial burden on healthcare systems as a result of its intricate treatment regimens and the potential necessity for extended rehabilitation and palliative care (Macpherson, 2018). Specific risk factors have been consistently linked to the development of oral cancer, despite the fact that it can affect anyone. The consumption of all forms of tobacco in all forms such as smoking, chewing and snuffing, is the primary risk factor (Vigneswaran and Williams, 2014). The precursors to the development of malignant tumours are the genetic mutations and abnormal cell growth that can be the consequence of the harmful substances in tobacco products. Another substantial risk factor is excessive alcohol consumption, which not only directly damages oral tissues but also compounds the carcinogenic effects of tobacco (Macpherson, 2018; Vigneswaran and Williams, 2014). The diagnostic process is frequently complicated by the symptoms of the early-stage oral cancer. The diagnosis may be postponed until the disease has progressed, as the initial symptoms may be easily disregarded or misinterpreted as benign conditions. Chronic oral ulceration, erythematous or leukoplakic lesions on mucosal surfaces, unexplained haemorrhage, paraesthesia or discomfort in the oral cavity, challenges in mastication or deglutition and changes in vocal quality are the initial indicators that are typically observed (Khan, 2012). These symptoms may also be indicative of a variety of benign conditions, which can result in a diminished awareness of the necessity of prompt medical consultation, despite the potential for concern (Vigneswaran and Williams, 2014; Khan, 2012). Oral cancer is frequently diagnosed only after it has advanced to later stages, during which the lesions may infiltrate deeper tissues and metastasise to other regions of the body. This emphasises the critical significance of increased awareness among healthcare professionals and the general public, as it will enable the prompt screening and professional evaluation of symptoms that are alarming (Kiran and Abidullah, 2017). Early detection remains a critical component in the battle against the disease, despite the significant progress made in cancer research and remedies in recent decades. The potential reduction in healthcare expenses, the expansion of treatment alternatives and the likelihood of less invasive procedures are all facilitated by timely diagnosis. This emphasis on early detection is in accordance with the current trend in healthcare towards preventative and personalised treatment, which is designed to identify diseases in their earliest stages when they are most susceptible to intervention (Jaber, 2011). By meticulously analysing the disease's prevalence, risk factors and clinical manifestations, as well as by understanding the underlying contributors to its development and acknowledging the various techniques and technologies used for early detection, healthcare professionals, policymakers and the public can work together to develop a more effective strategy to address this global health concern. The purpose of this study was to evaluate the knowledge, attitudes and practices of dental practitioners in the early detection of oral premalignant lesions and oral cancer.

MATERIALS AND METHODS

A cross-sectional study was conducted to evaluate the knowledge, attitudes and practices of dental practitioners concerning the early diagnosis of oral premalignant lesions and oral cancer in Hyderabad, Telangana.

Formulation of the Questionnaire

In order to assess dental practitioners' practices, attitudes and knowledge regarding the early detection of oral premalignant lesions and oral cancer, the investigator created the questionnaire. The questionnaire consisted of four components: demographic data, knowledge evaluation, attitude assessment and behavioural analysis. On the basis of existing literature, the questionnaire was developed. The questionnaire's initial draft was composed of closed-ended queries and was written in English.

The questionnaire responses were evaluated using a binary scale that included "yes" and "no." The questionnaire was to be completed anonymously by the participants.

Specifications of the pilot study

A pilot study was conducted with 30 participants. The pilot study was conducted to assess the feasibility of this research and to identify challenges encountered during the procedure. A 27-item self-administered questionnaire was prepared on knowledge related to chair side diagnostic devices and autofluorescence based devices to diagnose potentially malignant disorders and oral cancer, dentists attitude on the need to perform oral cancer screening and the need to educate people about routine self oral examination for any suspicious lesions, practice on usage of autofluorescence based devices for oral cavity examination and mass education programmes on oral cancer. The face validity was determined by administering the questionnaire to five dental practitioners, who assessed the clarity and interpretation of the questions. The content validity was checked by distributing the questionnaire to five experts, comprising academics from pertinent departments and seasoned practicing dentists, who evaluated whether the questions sufficiently addressed the study's objectives. The participants filled out a questionnaire and their recommendations were documented. All ambiguities and deficiencies identified have been rectified. A final questionnaire comprising 22 items was prepared, with internal consistency at Cronbach's alpha=0.75.

The sample size for this research was estimated at 384 participants, as determined by the results of a pilot study using the formula $N=z^2pq/d^2$. In order to guarantee a representative sample from the five zones of Hyderabad-South, East, West, North and Central-an area sampling method was implemented. Until the necessary sample size was attained, approximately 90 to 100

dental professionals were recruited from each zone. Participants who were reticent to participate or who submitted incomplete responses were excluded from the analysis, while those who provided full consent and completed the questionnaire were included. The ethical approval was received from the Institutional Review Board of Saveetha Dental College, Chennai, Tamil Nadu. Approval Number: IHEC/SDC/OMED-1608/22/331. The survey was methodically executed over a two-month duration, from November 2022 to December 2022.

Data collecting occurred in dental clinics, where dentists were solicited. The clinic receptionist supplied each practitioner with pertinent study information, institutional recognition and the researchers identify, which was communicated through the outpatient monitoring personnel. Upon engaging with the participants, the study's objectives and methodology were elucidated in person and verbal agreement was secured prior to the distribution of the questionnaire. Participants were allotted adequate time to complete the questionnaire, which was gathered on the same day.

Statistical Evaluation

All data collected were assessed for completeness prior to being coded and input into Microsoft Excel 2020 for initial organisation. Statistical analysis was conducted utilising the Statistical Package for Social Sciences (SPSS), version 24.0. Descriptive statistics and frequency distributions were utilised to compute mean values. Chi-square tests were performed to ascertain the relationships among factors pertaining to knowledge, attitude and practice. A significance level of $p<0.05$ was utilised. The findings were illustrated through tables and graphs created in Microsoft Word.

RESULTS

The study included 384 participants, with 30.5% being male dentists and 69.5% female dentists. The mean age of the participants was 31.8±3.24 years. The results are presented as follows:

Knowledge Scores

The frequency distribution of knowledge scores categorised as "good" and its correlation with age and gender is presented in Table 1. Figure 1 illustrates the proportional distribution of knowledge scores. The study revealed that 67% of participants demonstrated a commendable level of knowledge, while 33% showed a reduced level of knowledge. The mean knowledge score was 6.12±1.94, indicating a generally moderate to high level of knowledge among participants. A standard deviation of 1.94 indicates variability in knowledge levels within the sample. The data indicated a positive trend, as older participants demonstrated higher knowledge scores. Age was recognised as a significant factor affecting knowledge ($p<0.05$), whereas gender did not have a significant impact on knowledge scores ($p>0.05$).

Attitude Scores

Table 2 presents the frequency distribution of favourable attitude scores alongside their correlation with age and gender. Figure 2 illustrates the proportional distribution of attitude scores. The findings revealed that 81% of participants exhibited a positive attitude, whereas 19% displayed a less favourable attitude. The mean attitude score was 4.58±1.12, indicating a predominantly positive attitude towards the early detection and diagnosis of oral premalignant lesions and cancer. Chi-square analysis indicated a significant relationship between age and attitude ($p=0.001$), showing that older participants exhibited more favourable attitudes. No significant relationship was identified between gender and attitude ($p>0.05$).

Figure 1: Percentage distribution of knowledge.

Table 1: Frequency of good knowledge and its association with age and gender.

Questions	Mean±S.D.	Frequency	Percentage	Age χ^2 *p* value	Gender χ^2 *p* value
1	1.72±0.47	271	70.6%	0.001*	0.001*
2	1.99±0.13	378	98.4%	0.99	0.55
3	1.78±1.95	295	76.8%	0.001*	0.27
4	1.71±1.79	270	70.3%	0.001*	0.17
5	1.78±1.72	293	76.3%	0.001*	0.006*
6	1.43±1.78	163	42.4%	0.001*	0.06
7	1.91±1.45	347	90.4%	0.001*	0.19
8	1.99±1.92	380	99.0%	0.001*	0.09

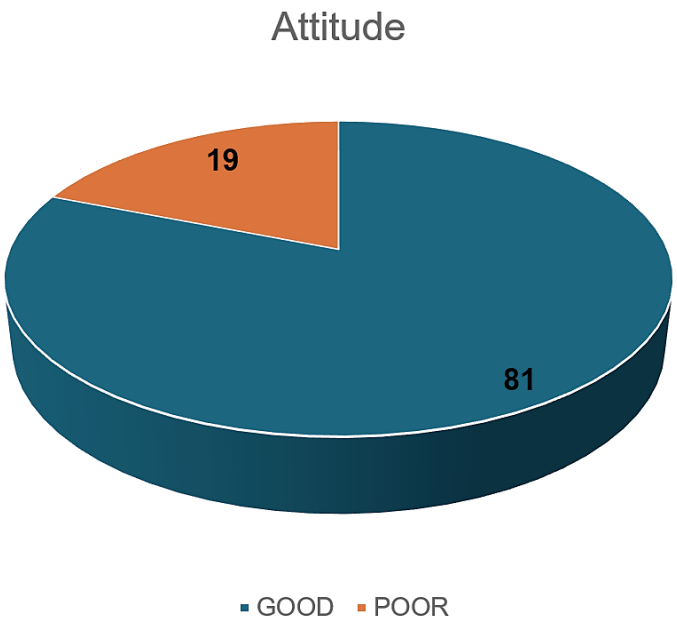

Figure 2: Percentage distribution of Attitude.

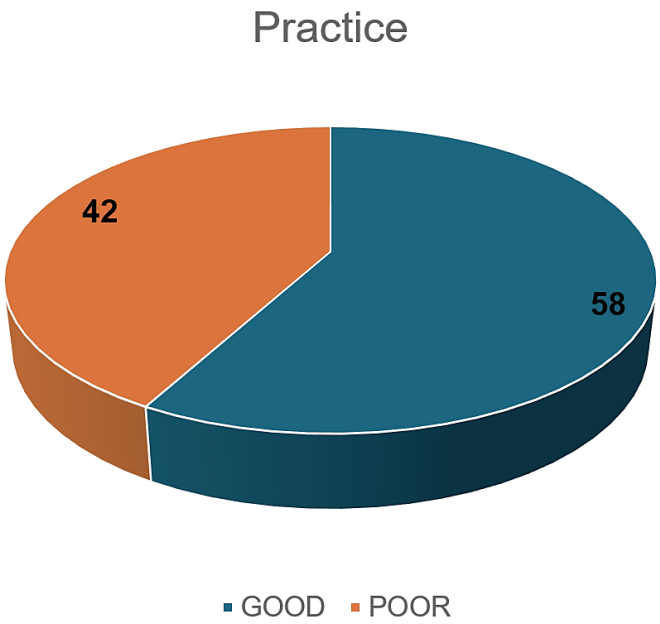

Figure 3: Percentage distribution of Practice.

Practice Scores

Table 3 analyses the frequency of good practices related to early detection and diagnosis, considering age and gender. The results showed that 58% of participants had a good practice score, while 42% scored lower in terms of practice. The mean practice score was 5.03±1.62, indicating room for improvement in screening and diagnostic practices among the participants. Figure 3 illustrates the percentage distribution of practice scores. The data indicated that age significantly influenced practice scores, with participants above 35 years more likely to engage in good practice behaviors ($p<0.05$). In contrast, gender did not have a significant effect on practice scores ($p>0.05$).

DISCUSSION

Oral cancer constitutes a significant global public health concern, marked by high morbidity and fatality rates (Vigneswaran and Williams, 2014). Timely recognition and prompt action are crucial for improving patient outcomes. Dental professionals, including dentists and dental students, play a crucial role in the prevention, identification and education concerning oral cancer (Khan, 2012). This study examined the existing knowledge, attitudes and behaviours of dental professionals and students on oral cancer, emphasising the implications for its management and prevention (Kiran and Abidullah, 2017). Among the 384 participants in the study, 30.3% were male dentists and 69.7% were female dentists. The gender imbalance in the dentistry profession reflects a broader trend in healthcare, wherein women are progressively surpassing men in numbers. This alteration is attributed to improved gender equality in education and career prospects, coupled with evolving cultural perceptions of historically male-dominated sectors. The dentistry sector is becoming diverse and inclusive, offering opportunity for creative viewpoints and methodologies in patient care. The average age of the participants was 31.3±3.12 years, suggesting that most were aged between 28.18 and 34.42 years. This conclusion indicates that the study sample primarily comprised young individuals in their early thirties. The constrained standard deviation of 3.12 years suggests a reasonably uniform age distribution among individuals, possibly reducing the confounding effects of age on

Table 2: Frequency of good Attitude and its association with age and gender.

Questions	Mean±S.D.	Frequency (updated for *n*=384)	Percentage	Age χ^2 *p* value	Gender χ^2 *p* value
9	1.76±0.45	289	75.3%	0.001*	0.21
10	1.97±0.12	380	99.0%	0.07	1.00
11	2.01±0.02	384	100.0%	0.001*	0.002*
12	2.02±0.03	384	100.0%	0.001*	0.004*
13	2.01±0.02	384	100.0%	0.001*	0.002*
14	1.89±0.30	347	90.4%	0.06*	0.009*
15	1.42±0.50	157	40.9%	0.08*	0.161

Table 3: Frequency of good Practice and its association with age and gender.

Questions	Mean±S.D.	Frequency	Percentage	Age χ^2 *p* value	Gender χ^2 *p* value
16	1.93±0.23	365	94.9%	0.001*	0.49
17	1.97±0.18	378	98.5%		1.00
18	1.30±0.46	114	29.8%		0.02*
19	1.20±0.41	76	19.7%		0.08
20	1.35±0.49	140	36.4%		0.87*
21	1.78±0.42	306	79.8%		0.055
22	1.40±0.51	184	48.0%		0.08

the study outcomes. Nearly all (99%) dental experts involved in this study concurred that routine screening for all patients at earliest stages would facilitate the diagnosis of cancer and precancerous lesions, hence aiding in their appropriate treatment with favourable prognoses and enhanced survival rates.

The results corresponded with the studies performed by Jaber M. A, 2011; Kiran *et al.*, 2017. A significant proportion of dental experts (70.7%) indicated that the prevalence of oral malignancies is primarily attributable to various harmful practices. This finding aligns with research by Nazar *et al.*, 2022; Khatri *et al.*, 2015, which revealed that 95.8% and 80.8% of dentists, respectively, enquired about habits such as smoking, tobacco use and alcohol consumption, demonstrating their awareness of the risk factors associated with oral cancer development. The acknowledgement of oral cancer risk factors by dental professionals aligns with other prior research documented in the literature. The majority of dentists recognised tobacco use in any form and alcohol use as the primary risk factors for the development of oral cancer (Hashim *et al.*, 2018; Mariño *et al.*, 2017). Less than half (42.4%) of dental professionals are adept at employing screening technologies for the identification of malignant tumours. A significant majority of patients assert that the signs, symptoms and clinical presentation of the lesions suffice for diagnosis; nonetheless, in instances of ambiguity, a biopsy is advised for a definitive diagnosis. The findings aligned with the research performed by Macpherson *et al.*, 2003; Saleem *et al.*, 2021. In the current study, 65% of dental practitioners demonstrated a comprehensive understanding of the risk factors, signs and symptoms, diagnosis and treatment methods.

Dentists function as main healthcare providers in the identification of oral cancer. A thorough comprehension of oral cancer risk factors, clinical manifestations and diagnostic methods is crucial. Research has demonstrated differing degrees of proficiency among dental practitioners. Sandhu *et al.*, 2018, discovered that dental students possessed fundamental knowledge of oral cancer but were deficient in their ability to identify early indications and risk factors. Conversely, practicing dentists demonstrated elevated knowledge levels attributable to practical experience (Kujan *et al.*, 2014). In the current study, all participants (100%) expressed a favourable disposition towards the necessity of diverse awareness and educational initiatives regarding early oral cancer screening and diagnosis, thereby enhancing patient survival rates. Numerous prior research in the literature have confirmed analogous findings, demonstrating that dental professionals exhibit considerable enthusiasm in participating in educational programs focused on oral cancer prevention and screening (Saleh *et al.*, 2014; Leonel *et al.*, 2019; Tadbir *et al.*, 2013). 90% of dentists contend that instructing patients on oral self-examination is essential, as numerous precancerous and cancerous lesions are asymptomatic in their early stages, resulting in delays in obtaining medical assessment and negatively impacting prognosis (Saleem *et al.*, 2021). Informing patients about the initial indicators of oral cancer is essential, as many types may be asymptomatic and present as painless tiny swellings in the mouth cavity. Emphasising the importance of

primary prevention of oral cancer is crucial. Fewer than half (40%) of dentists claimed that a biopsy is necessary for all white and red lesions in the oral cavity, whereas the majority disagreed, citing that oral lesions may indicate a diverse range of underlying illnesses, from benign to malignant. The determination to do a biopsy for these lesions is intricate, frequently shaped by elements such as clinical presentation, patient history and the healthcare provider's expertise. A biopsy is generally recommended for non-healing ulcers persisting beyond three weeks. The findings corresponded with those documented by dental authorities in the research conducted by Saleem L *et al*., 2021; Nazar HS *et al.*, (Mehrotra *et al*., 2003), which indicated that dental students were supportive of incorporating oral cancer screenings into their routine clinical practice. The viewpoints of dental practitioners are shaped by their self-assessed proficiency in performing oral cancer assessments (Sujith *et al*., 2016). Integrating oral cancer education into dental curricula can cultivate more positive attitudes and a sense of accountability. In this study, almost all dentists (98.5%) consistently documented the habitual history during routine examinations and evaluated the oral mucosa for alterations and the presence of other lesions beyond the core issue. However, the response to participating in oral cancer diagnostic activities was considered unfavourable (29.8%). The findings align with the research of Bataineh AB *et al*., 2015, which indicated that merely 11% of practitioners acknowledged having undertaken a biopsy for oral cancer diagnosis.

This can be attributed to insufficient theoretical and practical skills among dentists in conducting biopsies during routine examinations, as only 19.8% acknowledged their familiarity with the biopsy procedure and merely 5.4% reported performing it routinely when required in the same study. Approximately 19% of dentists utilise autofluorescence equipment for oral cavity scanning. Despite their multiple advantages-non-invasiveness, reduced time requirements, chair-side application, increased sensitivity and early lesion detection-many dentists maintain that biopsy remains the gold standard for diagnosing malignant lesions. Consequently, these gadgets are considered adjunctive rather than definitive diagnostic tools. Approximately 55% of dentists consistently screen for and identify oral malignancies. Dentists' protocols for oral cancer include clinical assessments, patient education and referrals. Routine dental examinations enable early detection opportunities. Nonetheless, research reveals variability in the regularity and thoroughness of these assessments. Documented challenges include time constraints, inadequate training and reluctance to discuss cancer risk factors with patients (Sandhu *et al*., 2018; Sujith *et al*., 2016). Dental practitioners must improve their procedures by including thorough oral cancer screenings, risk factor evaluations and efficient communication tactics into standard patient care. Effective management of oral cancer necessitates coordination between dental experts and the wider healthcare system. Dental professionals and students play a crucial role in the prevention, detection and treatment of oral cancer. To augment their function, ongoing educational interventions, including workshops and seminars, must be instituted to develop their knowledge and abilities. Advocating for positive attitudes and patient-centred practices is essential for delivering comprehensive oral cancer care and enhancing patient outcomes.

STRENGTHS OF THE STUDY

This study's exhaustive evaluation of dental professionals' knowledge, attitudes and practices regarding oral cancer is one of its primary strengths. The study encompasses a wide range of perspectives by incorporating both practicing dentists, providing a comprehensive understanding of the impact of varying levels of experience on the management of oral cancer. Furthermore, the study's extensive and diverse sample size establishes a strong foundation for extrapolating the results to a more extensive dental professional population. Ensures consistent and comparable data by facilitating a standardised evaluation of respondents' knowledge and practices through the use of structured questionnaires. Lastly, the study also aligns its findings with prior research, thereby enabling a thorough comparison with the existing literature and bolstering the credibility of the conclusions derived.

LIMITATIONS OF THE STUDY

This study has certain limitations that must be acknowledged, despite its virtues. The cross-sectional design is restricted in its capacity to observe changes in attitudes and practices over time or infer causation, as it captures responses at a single point in time. Self-reported data on practices may also introduce social desirability bias, in which participants may overstate positive behaviours, particularly in areas relevant to patient care and preventive practices. Additionally, the study fails to consider the potential impact of geographic regions on the prevalence of oral cancer, which could potentially affect the practices and awareness of dental professionals. Finally, the study sample size is substantial; however, the inequitable gender distribution may restrict the ability to comprehensively evaluate gender-specific trends, as female dentists comprised the majority.

FUTURE RECOMMENDATIONS

A longitudinal approach should be taken into account in future research to evaluate the evolution of knowledge, attitudes and practices as a result of ongoing clinical experience and education. Additionally, the integration of direct observational methods with self-reported data could yield a more precise evaluation of practical behaviours and identify specific skill deficiencies in diagnostic and preventive measures. A more exhaustive comprehension of regional variations in oral cancer awareness and screening practices would be achieved by broadening the scope of the study to include dental professionals from a variety

of regions. Furthermore, additional research should examine the efficacy of particular educational interventions, such as simulated training sessions or seminars, in enhancing the diagnostic confidence and skills of dental professionals.

CONCLUSION

The importance of dental professionals in the prevention, early detection and management of oral cancer is emphasised in this study. Although the knowledge of risk factors, clinical presentations and diagnostic methods is relatively high, there are still gaps in practical application. Less than half of the surveyed professionals routinely conduct biopsies or use screening devices. This underscores the necessity of improved training and clinical experience to cultivate a higher level of confidence and proficiency in the execution of comprehensive oral cancer assessments. Furthermore, the overwhelming support for educational initiatives indicates that dental professionals acknowledge the significance of ongoing learning in enhancing patient care. The results underscore the importance of routine patient screening, habit history documentation and patient education as fundamental practices that have the potential to significantly enhance outcome outcomes for early detection and intervention. It is imperative that dental professionals are adequately equipped to conduct comprehensive cancer examinations by overcoming obstacles such as time constraints and inadequate practical training. In general, the dental profession will benefit from a proactive approach that is promoted through regular educational programs and practical skill-building in order to reduce oral cancer morbidity and mortality, thereby improving public health outcomes.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

KAP: Knowledge Attitude Practice; **WHO:** World Health Organisation.

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