



# Knowledge, Attitude and Practice of Dental Practitioners towards Screening for Oral Pre-Cancer and Cancer

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

One of the global health issues is Oral cancer, which has an increased death rate. Awareness of oral cancer screening is important for oral health care professionals for early detection and improving the patients' survival rate. Attitude towards oral cancer awareness and knowledge of oral cancer screening are the key factors that impact oral cancer awareness success.

**Materials and Methods:** To assess the knowledge, attitude, and practice of dental practitioners and dental students towards screening for oral pre-cancer and cancer. This study included dental practitioners working in various academic institutions and private practitioners in Chennai. Participants were asked to fill in age, gender, designation, and experience. A structured questionnaire consisting of 10 questions, each having four options, was administered to the participants. The data collected was 100 responses analyzed by statistical package for the social science (spss inc., version 16 for, Chicago, IL, USA). Simple descriptive statistics were used to describe the distribution of data collected. T-test and ANOVA were employed to assess the statistically significant difference in the KAP scores between different groups.

**Results:** The response rate for the present study was 100%. 37% of general dental practitioners reported that they routinely do a thorough oral examination for all the patients, 52% agree that they

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are adequately trained to examine patients for oral pre-cancer and cancer screening, 8% of them reported that they never do toluidine blue staining for patients with oral lesion. Majority (57) of them agree that they would recommend biopsy for suspected cases of oral cancer. Only 9% of the participants were aware of the time required for intraoral screening examination. 31% of them were aware of the risk of malignant transformation in a white lesion. 73% of the participants were aware of the occurrence of oral cancer in non-tobacco users was rare. 53% of them agree that thorough intraoral examination for oral cancer will reduce oral cancer mortality and morbidity.

*Keywords: Oral cancer; pre-cancer; oral screening; attitude; knowledge.*

## 1. INTRODUCTION

The global well-recognized health problem is the cancer of the oral cavity and the pharynx, leading to a higher rate of mortality, especially in developing countries [1,2,3,4].

Most studies have stated that heavy smoking and alcohol intake are important risk factors for oral cavity cancer [5]. Most oral cancer in the early stages goes unnoticed due to asymptomatic nature of the disorder, and most of them are detected at the later stages. Even though recent advancements in managing oral cancer, it has a poor survival rate with an average of 5-year of 50% [6,7].

Early diagnosis of oral cancer is required to reduce the rate of morbidity and mortality, lower treatment costs, and better quality of life. To achieve this, health professionals, especially dentists, should perform oral cancer examinations as part of their clinical practice and be aware of the disease's pathogenesis and first clinical signs [6,7]. Studies have reported a lack of sufficient knowledge and experience among professionals in diagnosing oral cancer in early stages [8] since there is no information regarding this issue among the dentist, the present study was conducted. Thus, the present study aimed to assess general dental practitioners' knowledge, attitude, and practices about oral pre-cancer and cancer screening in Chennai.

## 2. MATERIALS AND METHODS

The study included one hundred dentists which includes general dental practitioners and specialists in dentistry from various academic institutions and private practitioners in Chennai city. The participants were selected by random sampling using random number table. The study was explained to the participants and their consent were obtained. They were asked to fill in age, gender, occupation, and experience. A structured questionnaire consisting of 10

questions (Table 1), each with four options, was administered. The test-retest was conducted to validate the questionnaire. The questionnaire was pilot tested before conducting the study.

### 2.1 Statistical Analysis

The data collected was analyzed by statistical package for the social science (spss inc., version 16 for Chicago, IL, USA). Simple descriptive statistics were used to describe the data distribution. T test and ANOVA were employed to assess the statistically significant difference in the KAP scores between different groups.

## 3. RESULTS

The response rate of the study was 100%. 37% of general dental practitioners reported that they routinely do a thorough oral examination for all the patients. 52% agree that they are adequately trained to examine patients for oral pre-cancer and cancer screening. 8% of them reported that they never do toluidine blue staining for patients with oral lesion. Majority (57) of them agree that they would recommend biopsy for suspected cases of oral cancer. Only 9% of the participants were aware of time required for intraoral screening examination. 31% of them were aware of the risk of malignant transformation in a white lesion. 73% of the participants were aware of the occurrence of oral cancer in non-tobacco users was rare. 53% of them agree that thorough for intraoral examination for oral cancer will reduce oral cancer morbidity and mortality.

Since Attitude-based questions could not be used for scoring, we calculated the total score for each participant's knowledge-based questions.

We analyzed whether there is a statistically significant difference in the total score between different groups of participants.

There was no statistically significant difference in the mean score between groups divided based on occupation / based on experience.

**Table 1. Questions**

S.no	Questions
1	Do you perform a thorough intra oral examination of patients reporting to you for dental treatment? 1.Yes,routinely in all patients. 2.Yes, only in patients with the habit of tobacco use. 3.Yes, if the patient is symptomatic. 4.No.
2	Do you feel that you are adequately trained to examine patients for oral pre-cancer and cancer? 1. Yes 2.No 3.Not sure 4.Not necessary
3	What is your experience with toluidine blue staining for oral pre-cancer? 1.Never used. 2.Rarely 3.Not sure 4.Only if available
4	In your opinion, what is the age group at high risk of developing oral pre-cancer and cancer? 1.20years 2.25years 3.30 years 4.Over 40 years
5	In clinically suspected cases of oral cancer, what would you do? 1.Perform biopsy 2.Toluidine blue staining 3.Refer to a specialist. 4.Educate the patient to quit the habit.
6	What do you think is the time required to perform a thorough intraoral examination? 1.1 minute 2.3 minutes 3. 5 minutes 4. 10 minutes
7	Which of the following characteristic in a white lesion increases its risk of malignant transformation? 1. Age 2.Red component 3.Smoking and alcohol 4.All of the above.
8	What are the high risks sites for malignant transformation in the oral cavity? 1.Buccal mucosa 2.Ventral surface of tongue. 3.Palate 4.All of the above.
9	Is it possible for a person with no history of tobacco use to develop oral cancer? 1.Often 2.Never 3.Rarely 4. Not sure
10	In your opinion, what is the effect of a thorough intra oral screening examinations for oral cancers? 1.Significant reduction in cancer related morbidity and mortality. 2. Educate the patients about the risk of using tobacco. 3.Motivate the patients to quit the habit. 4.Early detection of precancer lesion.

Qualification, i.e., UG/PG was the only parameter that appeared to produce a statistically significant difference in the mean score ( $P=0.0001$ ), implies that the 3 years of PG training and experience significantly enhances the clinical knowledge necessary for oral cancer screening.

#### 4. DISCUSSION

It is the duty of the dentist to diagnose oral cancer at the early stages to prevent local and distant metastasis. Hence, it is essential to ensure the formation of solid technical, scientific, and ethical knowledge to promote health for the prevention of prevalent oral lesions. Although post-graduation are essential for the activity in this field, graduation is essential and must ensure that dental students have the relevant basic knowledge on prevention and early diagnosis of oral cancer [9].

In this study, about 89.7% reported that they used to examine the oral mucosa routinely, which is higher when compared with 81.9%, as reported by Soares TR, Carvalho ME, Pinto LS., [10]. The study by Applebaum E. et al. reports that 54% of physicians and 93% of dentists performed an oral examination of patients older than 56 years, while for checking risk factors, although 96% of physicians asked their patients whether they smoked or drank alcohol, only 9% of physicians and 39% of dentists could correctly identify the two most common locations for the onset of oral cancer [11]. According to Liu et al. the factors that influence the knowledge and practical components depend on the understanding of early detection of oral cancer in clinical practice [12]. This showed the need for health professional training in southern Colombia [11,13].

The answers for adequate training of intraoral examination among the participants revealed that above 95% of them said that annual oral cancer examinations should be provided for 40 years of age and above; patients who were suspected of oral cancer should be referred to the concerned specialist. About 99.1% felt a need for additional training regarding oral cancer examination. Only 7.5% of the subjects responded that their knowledge regarding the prevention and detection of oral cancer is current and adequate.

For the experience of toluidine blue staining, our results are in accordance with the report of Epstein et al which shows that the toluidine blue retention test is a promising screening tool for

high-risk oral precancerous lesions since it can reduce a large number of unnecessary biopsies [14]. Furthermore, concurring with other studies [12,15] our results encourage consideration of TBLU as a viable and feasible screening method in high-prevalence and low-resource scenarios like India.

Though the oral cavity is accessible for clinical examination and oral cancer and premalignant lesions have well-defined clinical diagnostic features, oral cancers are detected in their advanced stages. In fact, in India, 60%–80% of patients present with advanced disease compared to 40% in developed countries, which is consistent with patients presenting for medical care with more advanced disease in India compared with developed countries with alarmingly reduced overall survival [3].

For the detection of premalignant lesions, histopathological evaluation is of significant value. The current study suggests that histopathology may be helpful as a diagnostic tool in demonstrating a high degree of dysplasia. About 37% of general dental practitioners reported that they routinely do a thorough oral examination for all the patients. 52% agree that they are adequately trained to examine patients for oral pre-cancer and cancer screening. 8% of them reported that they never do toluidine blue staining for patients with the oral lesion, the majority (57%) of them agree that they would recommend biopsy for suspected cases of oral cancer.

Around 92.5% of professionals create awareness on the adverse effects of habits to their patients and help them to quit the habit, which is found to be higher than the other study with 82.1% conducted by Soares TR, Carvalho ME, Pinto LS., [10].

According to the literature, the main risk factors are exposure to tobacco and excessive alcohol consumption [14]. At least three-quarters of cases of oral cancer can be prevented by eliminating risk factors such as tobacco and alcohol consumption. Hence, it is essential to educate people about quitting tobacco and alcohol.

About 43% of the subjects responded ventral surface of the tongue to be the highest site of malignant transformation. This is in accordance with the study done by Liu et al. [16] were the tongue was the most common site for the

malignant transformation. Consistent with the prevalence of chewing tobacco, studies have estimated that 58% of worldwide head and neck cancers occur alone in South and Southeast Asia [14]. The incidence rates of cancers of the head and neck in both males and females in nearly all urban cancer registries of South Asia are among the highest in the world [14]. On the other hand, it is much lower in western countries where tobacco chewing habits are not common [14,12].

The Qualification of the professionals determines the knowledge percentage, and practical

application of that knowledge was better among Postgraduates higher than reported by other studies [17].

Smoking and alcohol were reported as risk factors by 63.5%, which is >92.4%, 94%, and 79.2%, respectively, reported by other authors [10,4,16]. In our study, the knowledge of age as a risk factor of oral cancer was 46%, which indicates that educating the etiopathogenesis of oral cancer has to be emphasized for undergraduate dental students.

**Table 2. The difference in the mean total scores among BDS and MDS (T-test)**

Group Statistics					
	Qualification	N	Mean	Std. Deviation	P Value
Total_sum	BDS	44	2.5000	1.21042	<0.0001
	MDS	56	3.8036	1.16650	

**Table 3. The difference in the mean total scores based on occupation using one way ANOVA test and post hoc comparison using Tukey HSD**

Occupation	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		P-value
					Lower Bound	Upper Bound	
Private	8	2.0000	.00000	.00000	2.0000	2.0000	<0.0001
Academics	40	2.7000	1.32433	.20939	2.2765	3.1235	
Both	52	3.8269	1.16688	.16182	3.5021	4.1518	
Total	100	3.2300	1.34731	.13473	2.9627	3.4973	

**Post hoc-Tukey HSD**

(OCCUPATION)		Std. Error	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Private	Academics	0.46169	0.288	-1.7989	.3989
	Both	0.45272	0.000	-2.9045	-.7493
Academics	Private	0.46169	0.288	-.3989	1.7989
	Both	0.25071	0.000	-1.7237	-.5302
Both	Private	0.45272	0.000	.7493	2.9045
	Academics	0.25071	0.000	.5302	1.7237

**Table 4. The difference in the mean total scores based on experience using one way ANOVA test and post hoc comparison using Tukey HSD**

**Total sum**

Experience	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		P-value
					Lower Bound	Upper Bound	
<5 years	70	3.1143	1.42994	.17091	2.7733	3.4552	0.019
5-10 yrs	22	3.8636	1.03719	.22113	3.4038	4.3235	
> 10 yrs	8	2.5000	.53452	.18898	2.0531	2.9469	
Total	100	3.2300	1.34731	.13473	2.9627	3.4973	

**Tukey HSD**

Experience (yrs)		Std. Error	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
<5	5-10	.31943	.054	-1.5097	.0110
	>10	.48775	.422	-.5467	1.7752
5-10	<5	.31943	.054	-.0110	1.5097
	>0	.53957	.035	.0793	2.6479
>10	<5	.48775	.422	-1.7752	.5467
	5-10	.53957	.035	-2.6479	-.0793

**Table 5. The difference in the mean total scores based on age using one way ANOVA test and post hoc comparison using Tukey HSD**

Age (years)	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		P Value
					Lower Bound	Upper Bound	
25-35	64	3.0938	1.49835	.18729	2.7195	3.4680	0.37
36-45	22	3.5455	1.01076	.21550	3.0973	3.9936	
>45	14	3.3571	1.00821	.26945	2.7750	3.9393	
Total	100	3.2300	1.34731	.13473	2.9627	3.4973	

**Table 6. Distribution of responses for the attitude questionnaire (Descriptives)**

Question	Responses			
Do you perform a thorough oral examination of patients reporting to you for dental treatment	Yes, routinely in all patients	Yes, only in patients with a history of tobacco use	Yes, if the patient is symptomatic	No
	87%	8%	5%	0
Do you feel that you are adequately trained to examine patients for oral pre-cancer and cancer	Yes	No	Not sure	Not necessary
	52%	25%	23%	0
What is your experience with toluidine blue staining for oral cancer	Never	Rarely	Not sure	Only if alcoholic
	8%	48%	8%	36%

In the present study, 97.1% of the subjects responded correctly to squamous cell carcinoma as the most common oral cancer, higher than 48.1% as reported in a study conducted by Soares TR, Carvalho ME, Pinto LS., [10].

The responses revealed that above 95% of them reported that annual oral cancer examinations should be provided for those people of 40 years of age and above. Patients suspected of having oral cancer lesions should be referred to a specialist as it improves the survival rate of patients. About 99.1% felt that there is a need for additional training regarding oral cancer. Only 7.5% of the subjects responded that their knowledge regarding the prevention and detection of oral cancer is current and adequate.

According to the practices, 89.7% reported that they used to routinely examine the oral mucosa, which is higher than 81.9%, as reported by Soares TR, Carvalho ME, Pinto LS., 2014 98.1% reported that patients with suspicious lesions were referred to an oral surgeon for further evaluation.

About 92.5% of the subjects educate their patients on the side effects of alcohol and tobacco and assist them in quitting the habit, which is higher than 82.1% as reported in studies conducted by Soares TR, Carvalho ME, Pinto LS., [10]. According to the literature, the main risk factors are exposure to tobacco and excessive alcohol consumption [14]. At least three-quarters of oral cancer could be prevented

by eliminating risk factors such as tobacco and alcohol. Thus, it is important to educate people regarding the adverse effects of the intake of alcohol and tobacco since not doing so may be deemed a negligent omission. The limitation of this study is that it is based on a self-administered questionnaire which may lead to over and under reporting, however, according to a study [18] this method is sufficiently valid for the most important research questions. In our study, Qualification, i.e., UG/PG, was the only parameter that appeared to produce a statistically significant difference in the mean score ( $P=0.0001$ ), implying that the three years of PG training and experience significantly enhance clinical knowledge necessary for oral cancer screening.

## 5. CONCLUSION

This study highlights the importance of oral examination in diagnosing oral pre-cancer and cancer and its awareness among dental practitioners and dental students. However, Qualification as undergraduates or postgraduates was the only parameter that significantly enhanced the knowledge component. Thus, more awareness for screening of oral cancer has to be brought among the undergraduate level by conducting CDE programs, camps, and knowledge about the latest oral screening methods.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

Ethical clearance was obtained from the Institutional Ethics Committee prior to the study and it was conducted for the period of one month.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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