

Knowledge, Attitudes, and Practices of Dental Undergraduates and Practitioners Regarding Oral Cancer in Jeddah, Saudi Arabia

Bashair Alsaud^{1*}, Khalid Aboalshamat², Shahad Baheydrh³, Khadeja Bukhari⁴, Najwa Al Mutairy⁴ and Bashair Aljubairy⁵

¹Master Student, Orthodontics Department, Faculty of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia

²Dental Public Health Division, Preventative Dentistry Department, College of Dentistry, Umm Al-Qura University, Makkah, Saudi Arabia

³General Dentist, King Abdulaziz University Dental Hospital, Jeddah, Saudi Arabia

⁴General Dentist, Private Clinic, Saudi Arabia

⁵Teaching Assistant Dentist, Ibn Sina National College, Jeddah, Saudi Arabia

***Corresponding Author:** Bashair Alsaud, Master Student, Orthodontics Department, Faculty of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia.

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Abstract

Background: Oral cancer is the sixth most common type of cancer. A significant reason for dentists' late diagnosis of oral cancer is lack of information.

Objectives: This study aimed to assess oral cancer knowledge, attitudes, and practices among dental undergraduates and practitioners in Jeddah, Saudi Arabia.

Methodology: A total of 400 dental practitioners and students participated in this cross-sectional study. Data were collected using a validated self-administered questionnaire modified from a previous study. Data were analyzed using SPSS software for T-tests, ANOVA, and linear regression tests.

Results: The mean score of correct answers about oral cancer risk factors was 6.07 (SD = 2.74) out of 12 questions. The most frequently identified factor was smoking (89.75%), whereas the least was poor diet/nutrition (19.25%). The mean score of correct answers about oral cancer signs and symptoms was 4.75 (SD = 2.23) out of nine questions. Non-healing ulcers (77%) was most commonly identified, and voice changes the least (31.75%). Total scores on risk factors and signs/symptoms were significantly higher ($p < 0.05$) among graduates from governmental institutes and Saudis as compared with private schools and non-Saudis. Also, graduates scored better ($p = 0.012$) than interns on signs and symptoms. Most respondents wanted to improve their oral cancer knowledge (87.5%). A total of 42% felt adequacy trained to help stop smoking. Most participants reported that they had adequate practice in detecting oral cancer during examinations, but only 54% routinely take biopsies for suspicious lesions.

Conclusion: Both dental students and dentists have sub-optimal levels of knowledge about oral cancer despite highly rating their own abilities. It is important to enforce academic curricula and continuing education with a focus on boosting oral cancer knowledge for early detection of this important disease.

Keywords: Oral Cancer; Knowledge; Attitudes; Saudi Arabia

Abbreviations

BMC: Batterjee Medical College; SCC: Squamous Cell Carcinoma; WHO: World Health Organization

Introduction

According to the World Health Organization (WHO), cancer is the second most common cause of death in the world [1] and there has been a continuing increase in the incidence of various cancers despite the wide range of available technologies for diagnosis [2]. Oral cancer, which can affect the lips as well as the mouth, is the sixth most common cancer [3]. Cancerous oral lesions appear much more often in higher socioeconomic status nations than in poorer ones, which leads to higher rates of death from this cancer in developed countries [1,2].

Squamous cell carcinoma (SCC) makes up 95% of all malignant lesions affecting the mouth [1]. Many factors contribute to the development of these lesions, including smoking or chewing nicotine products, drinking alcohol, betel quid chewing, and with regard to lip cancer, sun exposure [1]. The main signs and symptoms of oral cancer are likely to be seen during examinations by dental practitioners, and therefore, a standard oral examination is the ideal screening tool for predicting cancerous lesions [4]. Early diagnosis of malignant oral lesions provides numerous benefits for patients, including longer survival times, lower costs of treatment, and better quality of life [5]. In addition, earlier treatment reduces the risk of facial distortion caused by cancerous lesions [6].

One of the primary reasons for dentists making a late diagnosis of oral cancer is lack of information [7-9]. Several studies suggest that most premalignant lesions go undetected due to physician lack of implementation of oral cancer screening as part of their practice regimen, which contributes significantly to poorer prognosis, shortened survival times, and lowered survival rates [10-12]. Studies also show that the dentist's role in educating the public about oral cancer needs to be augmented [13].

Several studies have investigated knowledge and practices about oral malignancies among dental students and dentists, including research conducted in Ireland [14], Italy [15], Brazil [16,17], Colombia [18], India [19-21], Iran [22-24], Jordan [25], Kuwait [26] and Yemen [27,28]. Most of these studies revealed that dentists and students have acceptable levels of knowledge but need improvement with regard to some risk factors and diagnostic criteria. This can be accomplished by fostering improved school curricula and clinical practice standards for examinations in regard to oral cancer.

There have been two studies that investigated oral cancer knowledge among Saudi dentists and dental students. The first one found that only 29% of dentists and dental students were able to identify more than 11 out of 16 oral cancer risk factors [29]. However, it may be inadvisable to generalize the results to all Saudi dentists and dental students because the study used a convenience sample with high heterogeneity in educational levels and taken from only a few locations. In addition, 29.6% were dental health care workers, including dentists, and only 4.5% of the sample were students. In other words, the study did not focus solely on dentists and dental students.

The second study investigated only dental students in a private dental college in Riyadh and found that 81% of the students correctly answered all general questions about oral cancer [30]. Also, correct answers to 12 questions about oral cancer risk factors ranged from 66.4% (consumption of spicy foods) to 89.6% (tobacco product use). In the same study, around three-fourths of the students felt confident that they could detect oral cancer through a systematic examination and diagnosis.

However, there have been no studies assessing the knowledge, attitudes, and practices regarding oral cancer among dental undergraduates and dentists in Jeddah, Saudi Arabia, despite Jeddah being the second largest city with dentists in Saudi Arabia [31] and which has four dental colleges that offer bachelor's and postgraduate degrees in dentistry. Therefore, this study aimed to assess the baseline knowledge, attitudes, and practices around oral cancer among undergraduate dental students and dentists in Jeddah, Saudi Arabia.

Materials and Methods

This cross-sectional study investigated the knowledge, attitudes, and practices pertaining to oral cancer among undergraduate dental students and dentists in Jeddah who have direct contact with patients. Thus, in addition to practicing dentists, interns and students in their fourth, fifth, or sixth academic year were included in the study, and students in their first (orientation), second, or third academic year were excluded. A convenience sample was taken, and using a 5% level of accuracy, an approximately 50% expected prevalence, and a 95% confidence level, the minimum sample size was determined to be around 385 participants.

Dentists and dental students were recruited from King Abdulaziz University, Ibn Sina National University, Batterjee Medical College (BMC) and Al-Farabi Colleges, along with their affiliated hospitals and clinics in Jeddah. Data were collected using a self-reported questionnaire that participants answered in their free time and which took approximately 5 minutes to complete. Participants were recruited via face-to-face invitation at their work or study site in addition to via an electronic questionnaire that was sent to student group leaders for each academic year and to dental practitioners’ private social media groups. Each participant signed the study’s informed consent form before answering the questionnaire. This study was approved by the Ibn Sina National College ethical committee.

The questionnaire used for data collection was adapted from previous validated studies, with some modifications [32-34]. In addition, further modifications were made to match the local community [28].

The questionnaire comprised 24 closed-ended items in four parts. The first part contained eight demographic questions, including age, gender, type of institute, academic year, specialty, nationality, working environment, and years of practice. The second part assessed participant knowledge of oral cancer and included checklist questions to recognize the ability of a participant to identify 12 risk factors and nine clinical signs and symptoms of oral cancer. The third part measured participant attitudes and opinions about oral cancer with responses of agree, neutral, or disagree. The fourth part included eight questions to gauge participants’ routine assessments and practices with regard to the oral mucosa and identifying oral cancer, with possible answers of yes or no.

The gathered information was analyzed with the statistical software SPSS v.21 (IBM, Armonk, NY, USA). Descriptive statistics were generated along with frequency tables. T-test, ANOVA, and linear regression were used for data analysis, and a p value of < 0.05 was considered significant.

Results

Data were collected from 400 dental practitioners and dental undergraduates. Their mean (*m*) age was 26.25 years with a standard deviation (SD) of 4.9. The median years of experience was zero among all participants but ranged from 0 to 32 years. Participants’ demographic data are shown in table 1.

Variable		Frequency (%)	Total risk factors score <i>m</i> (SD)	Total signs and symptoms score <i>m</i> (SD)
Gender	Female	315 (78.80%)	6.05 (2.79)	4.73 (2.25)
	Male	85 (21.30%)	6.15 (2.57)	4.81 (2.15)
Academic year	Undergraduates in clinical years	84 (21.00%)	5.90 (3.21)	4.69 (2.61)
	Intern	149 (37.30%)	5.89 (2.58)	4.37 (1.96)
	Graduated	167 (41.80%)	6.31 (2.62)	5.11 (2.20)**
Academic institution	Governmental school	241 (60.30%)	6.59 (2.64)	5.15 (2.25)
	Private school	159 (39.80%)	5.29 (2.71)*	4.14 (2.06)*

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Nationality	Saudi	346 (86.50%)	6.23 (2.75)	4.86 (2.23)
	Non-Saudi	54 (13.50%)	5.04 (2.49)*	4.04 (2.07)*
Current work	Student or intern	220 (55.00%)	6.00 (2.87)	4.60 (2.29)
	Governmental sector	100 (25.00%)	6.34 (2.63)	5.16 (2.28)
	Private sector	80 (20.00%)	5.94 (2.52)	4.63 (1.94)
Total			6.07 (2.74)	4.75 (2.23)

Table 1: Demographic variables of participants with total score of correct answers on risk factors in addition to signs and symptoms questions.

* $P < 0.05$.

** Only graduate dentists had significantly higher total signs and symptoms scores than did dental interns.

The mean score of correct answers about oral cancer risk factors was 6.07 (SD = 2.74) out of 12 listed risk factors, and correct answers to nine questions about oral cancer signs and symptoms were $m = 4.75$ (SD = 2.23).

For total risk factor scores, a t-test analysis showed that scores were higher among participants who were studying at or had graduated from governmental institutes ($t(398) = 4.74, p < 0.001$), as opposed to participants who studied at or graduated from private institutes. Also, scores were higher among Saudis ($t(0.398) = 3, p = 0.003$) than non-Saudis. However, there was no significant difference between male and female participants, as shown in table 1. Using ANOVA, it was shown that there were no significant differences due to academic year or current workplace variables.

For total signs and symptoms scores, t-test results showed that scores were higher among participants who were studying at or had graduated from governmental institutes ($t(398) = 4.54, p < 0.001$) in comparison to participants who were studying at or had graduated from private institutes. Again, scores were higher among Saudis ($t(398) = 2.53, p = 0.009$) than non-Saudis. Also, there were once again no significant differences between male and female participants, as shown in table 1. Using ANOVA, the scores were shown to be significantly different with regard to the variable of academic year ($F(397, 2) = 4.5, p = 0.012$), and Tukey’s post hoc test showed that practicing dentists had significantly higher scores than dental interns ($p = 0.008$). However, no significant differences were found due to current workplace variables (See table 1). Using linear regression, no significant relationship was found between age or years of experience with total scores on either risk factors for or signs and symptoms of oral cancer.

The proportion of participants who correctly answered each question on risk factors and signs and symptoms are shown in table 2.

Risk factor	No. of correct answers (%)
Smoking	359 (89.75)
Smokeless tobacco use	275 (68.75)
Alcohol	259 (64.75)
Sun exposure	198 (49.50)
Viral infection	157 (39.25)
Older age	115 (28.75)
Immunosuppression	166 (41.50)
Prior history of cancer	241 (60.25)
Family history of cancer	284 (71.00)

Low consumption of fruits and vegetables or poor diet/nutrition	77 (19.25)
Poor oral hygiene	109 (27.25)
Lichen planus	188 (47.00)
Signs and symptoms	
Non-healing ulcer	308(77.00)
Pain	132 (33.00)
Erythroplakia and leukoplakia (red patches/white patches)	286 (71.50)
Dysphagia (difficulty swallowing)	191 (47.75)
Intraoral lump/neck mass	278 (69.50)
Unexplained bleeding/loose teeth	206 (51.50)
Paraesthesia (numbness)	227 (56.75)
Persistent sore throat	144 (36.00)
Voice changes	127 (31.75)

Table 2: Percentages of participants who answered correctly on risk factors and signs and symptoms questions.

Opinions about and practices around oral cancer among dental undergraduates and practitioners are illustrated in table 3 and 4, respectively.

Statement	No. of responses in agreement (%)
I have sufficient knowledge about prevention and detection of oral cancer (up-to-date).	227 (56.75)
I feel adequately trained to provide tobacco cessation education.	168 (42.00)
I am well trained to perform intraoral cancer examinations.	251 (62.75)
I am adequately trained to perform extraoral cancer examinations (palpate head and neck lymph nodes).	274 (68.50)
I am adequately trained to identify suspicious lesions.	238 (59.50)
I would like to improve my knowledge about oral cancer.	350 (87.50)

Table 3: Oral cancer opinions among dental undergraduates and practitioners.

Statement	No. of yes answers (%)
I ask my patients about their medical history.	394 (98.50)
I ask my patients about their family history of cancer.	356 (89.00)
I ask my patients if they use tobacco.	381 (95.25)
I advise my patients about oral cancer risk factors.	324 (81.00)
I routinely examine patients' oral mucosa.	378 (94.40)
I screen the oral mucosa of high-risk patients.	352 (88.00)
I have had the opportunity to examine patients with oral lesions.	310 (77.50)
I take biopsies of suspicious lesions.	216 (54.00)

Table 4: Oral cancer practices among dental undergraduates and practitioners.

Discussion

This study aimed to assess the levels of knowledge, as well as attitudes and practices, about oral cancer among dentists and dental students in Jeddah, Saudi Arabia. The results showed a mean of correct answers regarding risk factors at about the midpoint. The percentage of correct answers for each of the risk factors questions ranged from 19.25% (for poor diet) to 89.75% (for smoking). However, the total correct scores among respondents for signs and symptoms was just above the midpoint, with the percentage of correct answers ranging from 31% (for voice change) to 77% (non-healing ulcer). Only 42% believed they had the proper training required to help patients with smoking cessation. A total of 54% of respondents make it a practice to take biopsies of suspicious lesions.

In general, participants' levels of knowledge about oral cancer risk factors and signs and symptoms varied depending on the specific item, which is similar to most prior studies, both local and non-local [14,15,17-19,22,25,27-29]. However, comparing our results to previous studies in more depth is challenging because other researchers generally investigated different elements of risk factors, signs, symptoms, attitudes, and practices, although there is a level of similarity to our study with some items, as discussed below.

With regard to risk factors, tobacco and alcohol consumption are considered the two most important, and they were the most frequently identified by our participants, with 89.75% identifying smoking, 68.75% identifying smokeless tobacco use, and 64.75% identifying alcohol as risk factors. These percentages are similar to other local studies [29,30] and to studies conducted in Jordan, Italy, and Colombia [15,18,25]. However, they are lower than in studies conducted in Yemen, India, and Brazil [16,17,19,21,28]. Furthermore, less than one-third of the participants were able to identify old age and low consumption of fruits and vegetables as risk factors. This result was similar to studies conducted in Yemen, Brazil, India, Colombia, Italy, and Jordan [15,16,18,19,25,28] as well as one of the Saudi studies [29]. However, these results are lower than in studies conducted in Ireland, Brazil, and Yemen [14,17,27] and the other Saudi study [30], which reported higher rates of correct answers for such risk factors. Few participants in our study identified poor oral hygiene as a risk factor; but this might be due to the debatable results of research around oral hygiene and the risk of oral cancer [35]. Despite these differences, old age, low fruit and vegetable consumption, and bad oral hygiene seem to be less frequently recognized among dental students and practitioners across countries and in different studies. Certainly, dental curricula and continuing education courses in Saudi Arabia should be augmented to reinforce and enhance dental professional knowledge about risk factors.

For oral cancer signs and symptoms, participants had moderate levels of knowledge, with each of five items (out of nine) being recognized by 31.75% to 51.5% of respondents, including unexplained bleeding/loose teeth, dysphagia, persistent sore throat, pain, and voice changes. Also, the most frequently recognized sign was a non-healing ulcer, correctly answered by 77%, which is considered to be a low correct response rate among dental professionals. Indeed, our participants' correct answer scores regarding oral cancer signs and symptoms were lower than those of participants in the study conducted in Yemen [28]. This supports our recommendation that more focus should be put on oral cancer educational efforts aimed at Saudi dentists and dental students.

Our study reported higher scores for risk factors and signs and symptoms among students and graduates from governmental institutes than students and graduates from private institutes in Jeddah. Bearing in mind that the difference was not great despite its statistical significance, this might indicate that there are better levels of education in governmental institutes. Also, our results showed that graduates had higher scores on oral cancer signs and symptoms than did interns, which might be because they are more exposed to clinical cases.

Although the majority of our respondents were willing to improve their knowledge and take more courses about oral cancer, which is similar to a previous study conducted in Italy [8], two-thirds of the participants in our study believed they are well trained in conducting oral cancer examinations. However, reflecting on their levels of knowledge about signs and symptoms, participants might have overestimated their abilities to detect oral cancer, as their scores were ultimately not very promising. Additionally, 42% felt they are well trained to help patients stop smoking. Nevertheless, Saudi Arabia is fourth in the world in terms of tobacco consumption [36,37] and most respondents in our study likely face a number of smokers, so it would seem that they should be even more qualified to help with tobacco cessation programs.

Regarding oral cancer practices, our results revealed generally high rates of good practices encompassing most of the items, ranging from 98.5% to 88% adopting the listed practices. However, only 77.5% reported having the opportunity to examine patients for oral lesions, and only 54% reported that they routinely take biopsies of suspicious lesions. The latter may be because most dental students and dentists in Saudi Arabia are not trained to take biopsies and because there are no clear protocols to follow in such cases.

Comparing our results regarding oral cancer practices with previous studies is difficult, as each of the studies examined and assessed different sets of practices. However, the proportion of our respondents with good oral cancer practices seems to be higher in general than previous studies conducted in Yemen and Kuwait that asked about similar factors [26-28].

Based on our results, we recommend that improvements be made in curricula with regard to practices around oral cancer given that the level of knowledge among dentists and dental students seems to be moderate, particularly when contrasted with their relatively optimistic beliefs about their skills and abilities for dealing with oral cancer.

One of the strengths of our study in comparison to others is that our study used a relatively larger sample size. Nevertheless, the study has some limitations, including the use of a convenience sample and self-reported questionnaire, which suggest that participant answers could result in a reporting bias. Further, it is recommended that future studies add questions about the most common sites of oral cancer. This topic has been investigated in similar studies, so this addition could add value to participant assessment in future research.

Conclusion

The levels of knowledge about oral cancer among dental undergraduates and dentists in Saudi Arabia seem to be moderate but unsatisfactory and are lower than the levels of knowledge among similar populations in other studies. Therefore, it is important to place an emphasis on improving the focus on oral cancer in dental curricula and continuing education, which is even more crucial when taking into consideration that dentists are the most important screening gate for the early diagnosis of oral cancer.

Statement of Conflict of Interest

The authors declare there are no conflicts of interest.

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