

## RESEARCH ARTICLE

# Oral Cancer Awareness and Perception of Tobacco Use Cessation Counseling among Dental Students in Four Asian Countries

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## Abstract

**Background:** The scientific evidence relating to the burden of oral diseases attributable to tobacco use has been reviewed and the need for a well-structured dental teaching program concentrating on oral cancer education and tobacco cessation interventions has been emphasized. The aim of our study was to evaluate the awareness of oral cancer and perception of tobacco use cessation counseling among dental students at all study levels in India, Saudi Arabia, the United Arab Emirates, and Yemen. **Materials and Methods:** A structured, pre-tested, self-administered 15-item questionnaire was used to conduct a cross-sectional survey. Data analyses including percentages, frequency distributions and tests of chi-square were generated. **Results:** A total of 621 (97.6%) Indian, 493 (96.5%) Saudi, 194 (96.5%) Yemeni and 187 (98.4%) United Arab Emirates respondents recognized the association between oral cancer and cigarette smoking. Although more than 96% of the students surveyed recognized the association between oral cancer and cigarette smoking and about 55% reported cigarette smoking as one of the etiological factors of oral cancer, more than 66% of students who reported cigarette smoking as an etiological factor of oral cancer disagreed/strongly disagreed with all the statements concerning tobacco use cessation. **Conclusions:** A higher level of oral cancer awareness did not have a positive impact on the perception of tobacco use cessation counseling among the sample surveyed.

**Keywords:** Dental students - awareness - oral cancer- tobacco cessation

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## Introduction

Tobacco use, considered to be the most preventable cause of death and disability, causes 4 million deaths annually and is related to 30% of all cancers (Wald and Hackshaw, 1996; Banoczy and Squier, 2004). The most commonly cited risk factors in the etiology of oral cancer are tobacco and alcohol (Andre et al., 1995). Evidence from literature suggests an increase in the risk of diseases with a concomitant increase in use of tobacco and that quitting its use results in decreasing this risk (Johnson and Slach, 2001). The scientific evidence relating to the burden of oral diseases attributable to tobacco use has been reviewed (Legarth and Reibel, 2008) and the need for a well-structured dental teaching program concentrating on oral cancer education (Uti and Fashina, 2006) and tobacco cessation interventions (Gordon and Severson, 2001) has been emphasized.

Squamous cell carcinoma, accounting for 95% of oral cancer (Johnson and Warnakulasuriya, 1993) with known high-risk factors, identifiable clinical features and effective treatment for early lesions (Mashberg and Barsa,

1984; Blot et al., 1988) may remain undetected in the early stages because of the dental practitioners' attitudes and knowledge (Sadowsky et al., 1988; Schnetler, 1992). Several studies have reported the oral cancer awareness of dental students (Jaber et al., 1997; Carter and Ogden, 2007; Ogden and Mahboobi, 2011). On the other hand, the effectiveness of tobacco use cessation (TUC) counseling in dental office and the fact that the performance of these programs can be as effective in dental practice as in other primary health care settings are well documented (Warnakulasuriya, 2002; Carr and Ebbert, 2007). A cross-sectional study conducted by Chowdhury et al. (2010) had explored the oral cancer knowledge and tobacco control attitudes of Bangladeshi dental undergraduates. However, no attempts have been made to assess the attitudes and awareness of dental students at all study levels from India, Saudi Arabia, UAE and Yemen regarding oral cancer and TUC counseling. Consequently, the aim of our study was to evaluate the awareness of oral cancer and perception of TUC counseling among dental students at all study levels in India, Saudi Arabia, UAE, and Yemen. We also hypothesized that, since cigarette smoking is a major risk

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factor in the etiology of oral cancer, students reporting better awareness of oral cancer would be more likely to have a better perception of TUC counseling. To test this hypothesis, our additional objective was to analyze the perception of TUC counseling among the respondents reporting an association between cigarette smoking and oral cancer.

## Materials and Methods

This study was approved by the College of Dentistry Research Center (CDRC) and permission to conduct the survey was solicited and obtained from the respective Heads of institutions. A cross-sectional survey that included a convenience sample of dental students of all years of study was done. The sample was drawn from Kerala University of Health Sciences; India, King Saud University, Al Kharj University and University of Dammam; Saudi Arabia, Ajman University of Science and Technology, and University of Sharjah; United Arab Emirates (UAE) and University of Aden; Yemen. A structured, pre-tested, self-administered 15-item paper-and-pencil questionnaire in English language adopted from Carter and Ogden (2007) concerning oral cancer awareness and Pizzo et al. (2010) concerning TUC counseling was used. The questionnaire was pre-tested with a group of 10 randomly selected male and female students who were each in their first- or fifth-year to identify any obstacles to its comprehension, and necessary modifications were made accordingly. These students were not included in the final analysis.

During the 2011-2012 academic year, first-year through fifth-year students at the cooperating institutions were invited to participate in our survey. A brief written introduction to the study emphasizing the voluntary and anonymous nature of the study participation was included on the first page of the questionnaire. The questionnaire included demographic variables of the responding students such as age, gender and year of study. Oral cancer awareness variables included the knowledge of students regarding the causative factors and early signs and symptoms of oral cancer which were asked as open questions rather than providing answers and tick boxes. The most common site of oral cancer was asked with tongue, floor of mouth, cheeks, gums, palate and 'I don't know' as options. The current smoking status of students and the adverse health effects of smoking were asked. Six statements on TUC counseling were included with each statement having a five-point Likert scale response ranging from strongly agree to strongly disagree. The questionnaire also explored the students' perceived need for further education in oral cancer and TUC counseling. At the end of a regularly scheduled classroom lecture, the questionnaires were distributed to a total of 800 students each in India and Saudi Arabia, and 400 students each in Yemen and UAE present on the day of the survey by their respective class representatives to be completed and returned immediately.

First year and second year students were grouped as preclinical students and the remaining levels of study were grouped as clinical students. Statistical analysis was

done using SPSS version 16.0 (SPSS Inc., Chicago, IL, USA). Data analyses including percentages, frequency distributions and tests of chi-square were generated. The chi-square test was used as appropriate to examine differences in study level (pre-clinical and clinical) and smoking status. The statistical significance level was set at  $p < 0.05$ .

## Results

Of the 1553 completed surveys, 637 (41%) were from India, 520 (33.5%) from Saudi Arabia, 203 (13.1%) from Yemen and 193 (12.4%) from UAE. The overall response rate from India, Saudi Arabia, Yemen and UAE were 79.6%, 65%, 50.7% and 48.2%, respectively. Majority of the respondents were females (955 females; 598 males), non-smokers (1432 non-smokers; 106 smokers) and clinical students (898 clinical students; 655 preclinical students).

The knowledge of the relationship between all the stated adverse health conditions and smoking was significantly higher in clinical students compared to preclinical students ( $p < 0.05$ ). Taking the total sample into consideration, the percentage of positive response to the presence of relationship between smoking and oral cancer (96.3%) and lung cancer (97.3%) was higher whereas, the percentage of positive response to the association between smoking and peripheral vascular disease was only 59.1% and that of implant failure and oral candidiasis was 62.8% and 65.4% respectively. Among the 1553 respondents, 621 (97.6%) Indian, 493 (96.5%) Saudi, 194 (96.5%) Yemeni and 187 (98.4%) UAE respondents recognized the association between oral cancer and cigarette smoking. However, only 287 (45.1%) Indian and 108 (56.8%) UAE respondents recognized the association between implant failure and cigarette smoking, and only 317 (62%) Saudi and 111 (55.2%) Yemeni respondents recognized the association between peripheral vascular disease and cigarette smoking. Ninety nine (95.2%) smokers and 1386 (97.4%) non-smokers recognized the association between lung cancer and smoking whereas, only 64 (61.5%) smokers recognized the association between implant failure and smoking and only 765 (53.8%) non-smokers

**Table 1. Etiology of Oral Cancer According to Study Level and Smoking Status**

Etiology of oral cancer	Study level		Smoking status	
	Pre-clinical n=655 (%)	Clinical n=898 (%)	Smokers n=106 (%)	Non-smokers n=1432 (%)
Smoking	329 (49.4)	532 (59.5)	48 (45.3)	803 (56.3)
Chewing tobacco	228 (34.9)	428 (47.9)	26 (24.5)	625 (43.8)
Alcohol	44 (6.7)	192 (21.5)	17 (16.0)	219 (15.3)
Betel nut/pan chewing	99 (15.1)	181 (20.2)	4 (3.8)	275 (19.3)
Chronic irritation/trauma	10 (1.5)	103 (11.5)	3 (2.8)	109 (7.6)
Poor oral hygiene	25 (3.8)	95 (10.6)	5 (4.7)	114 (8.0)
Solar radiation	24 (3.7)	61 (6.8)	4 (3.8)	81 (5.7)
Genetics	19 (2.9)	56 (6.3)	4 (3.8)	69 (4.8)
Viral infection/immunodeficiency	19 (2.9)	51 (5.7)	3 (2.8)	67 (4.7)
Dietary factors	6 (0.9)	14 (1.6)	1 (0.9)	19 (1.3)
I don't know	198 (30.3)	130 (14.5)	33 (31.1)	286 (20.0)

**Table 2. Responses (strongly disagree+disagree) According to Study Level and Smoking Status**

	Study level		Smoking status	
	Pre-clinical n=655 (%)	Clinical n=898 (%)	Smokers n=106 (%)	Non-smokers n=1432 (%)
Dentistry is the ideal profession in influencing patients to quit smoking	525 (80.3)	768 (85.8)	80 (75.5)	1203 (84.2)
Dental clinic is a suitable place to give information about the ill effects of smoking	536 (82.2)	805 (89.9)	91 (85.8)	1239 (86.8)
Dentists should request patients to quit smoking	596 (91.1)	829 (93.0)	87 (82.1)	1326 (93.1)
Dentists must explain the hazardous effects of smoking to smokers	617 (94.3)	865 (97.0)	95 (90.5)	1374 (96.3)
Dentists should help smokers regarding cessation interventions	524 (81.1)	780 (88.1)	86 (81.9)	1207 (85.5)
Patients regard dentists highly if they recommend quitting	405 (62.5)	595 (68.2)	73 (69.5)	920 (65.6)

**Table 3. TUC Perceptions of Respondents Reporting Cigarette Smoking as an Etiological Factor of Oral Cancer**

	Strongly agree n (%)	Agree n (%)	I don't know n (%)	Disagree n (%)	Strongly disagree n (%)	Missing n (%)
Dentistry is the ideal profession in influencing patients to quit smoking	10 (1.2)	104 (12.2)	17 (2.0)	490 (57.3)	232 (27.1)	2 (0.2)
Dental clinic is a suitable place to give information about the ill effects of smoking	6 (0.7)	74 (8.7)	17 (2.0)	464 (54.3)	291 (34.0)	3 (0.4)
Dentists should request patients to quit smoking	7 (0.8)	33 (3.9)	10 (1.2)	316 (37.0)	485 (56.7)	4 (0.5)
Dentists must explain the hazardous effects of smoking to smokers	2 (0.2)	13 (1.5)	7 (0.8)	265 (31.0)	566 (66.2)	2 (0.2)
Dentists should help smokers regarding cessation interventions	4 (0.5)	54 (6.3)	51 (6.0)	371 (43.4)	363 (42.5)	12 (1.4)
Patients regard dentists highly if they recommend quitting	21 (2.5)	139 (16.3)	113 (13.2)	369 (43.2)	195 (22.8)	18 (2.1)

recognized the association between peripheral vascular disease and smoking. A significantly higher percentage of clinical students (43.4%) compared to pre-clinical students (15.2%) reported tongue as the most common site of oral cancer ( $p < 0.05$ ). Majority of preclinical students (32.6%) did not know the most common site of oral cancer.

A wide range of responses were generated for the two open questions concerning causative factors and early signs and symptoms of oral cancer. Cigarette smoking was reported as a causative factor for oral cancer by 855 (30.1%) respondents, chewing tobacco by 656 (23.1%), betel nut/pan chewing by 280 (9.9%) and alcohol by 236 (8.3%) respondents. The least reported causative factor was 'dietary factors', by 20 (0.7%) respondents. Other reported responses include chronic irritation/trauma, poor oral hygiene, genetics, viral infection/immunodeficiency and 'I don't know'. Table 1 shows the causative factors of oral cancer according to the study level and smoking status of the respondents. It is evident that more number of Indian respondents reported chewing tobacco, compared to cigarette smoking and other responses, as a causative factor for oral cancer. However, more number of Saudi, Yemeni and UAE respondents reported cigarette smoking as a causative factor for oral cancer compared to other responses.

Taking the responses to signs and symptoms of oral cancer into consideration, ulcerations was reported by 291 (10.2%), color change was reported by 467 (21.4%) respondents but only 13 (0.6%) respondents reported lymphadenopathy. Five ninety eight (27.5%) respondents, out of which 234 are clinical students, did not know the signs and symptoms of oral cancer. Other reported responses include abnormal overgrowth, swelling, fixation to underlying tissues, asymptomatic/painless, bleeding, teeth degradation/halitosis, loss of taste sensation, burning sensation/irritation, difficulty in daily activities, pain/fever/fatigue, weight loss and infection of the lesion.

Majority of respondents either disagreed or strongly disagreed with all the statements concerning TUC perceptions. Taking the respondents who had agreed

with the statements into consideration, more number of respondents has agreed with the statement 'patients regard dentists highly if they recommend quitting' compared to other statements. Table 2 shows the number and percentage of respondents disagreeing/strongly disagreeing with the six statements regarding TUC counseling according to study level and smoking status. A higher percentage of clinical students and non-smokers either disagreed or strongly disagreed with TUC statements compared to pre-clinical students and smokers respectively. Considering the need for further education in oral cancer and TUC, 73.1% and 65.6% respectively reported 'no need' or only 'slight need'.

Among 1553 respondents, 855 (55.1%) reported cigarette smoking as one of the etiological factors of oral cancer. The TUC perceptions of these respondents are given in Table 3. It is evident that majority of these respondents either disagreed or strongly disagreed with TUC statements.

## Discussion

The results of our study have revealed vital information concerning the awareness of oral cancer and perception of TUC counseling of Indian, Saudi Arabian, UAE and Yemeni dental students. Although more than 96% of the students surveyed recognized the association between oral cancer and cigarette smoking and about 55% reported cigarette smoking as one of the etiological factors of oral cancer, more than 66% of students who reported cigarette smoking as an etiological factor of oral cancer disagreed/strongly disagreed with all the statements concerning TUC. The number of current smokers among our respondents was less, which is consistent with literature of smoking rates among health professionals (Secker-Walker et al., 1994). Due to a minimal number of current smokers in our study, any significant relationship based on smoking status should be viewed with caution.

The knowledge of the association between cigarette smoking and all the stated adverse health conditions was

significantly higher among clinical students compared to preclinical students of our sample and is in concurrence with the results of an Italian study conducted among dental and dental hygiene students (Pizzo et al., 2010). The results of this study revealed that the percentage of positive responses to the presence of a relationship between smoking and diseases was higher in final year students of both dental and dental hygiene students compared to entry-level students. Majority of our clinical students believed that tongue is the most common site of oral cancer which is in agreement with the results of a Nigerian study (Uti and Fashina, 2006) but, it is not in accordance with the results of a Spanish study (Jaber et al., 1997) which reported that majority of their respondents believed lower lip as the most common site of oral cancer. However, the methodology of both the Nigerian and Spanish study did not state whether the most common site of oral cancer was asked as a close- or open-ended question. The question concerning the most common site of oral cancer in our study was asked as a close-ended question with tongue, floor of mouth, cheeks, gums, palate and 'I don't know' as possible options.

Tobacco and alcohol was reported as etiological factors for oral cancer by majority of our clinical students and this corroborates with the results of British (Carter and Ogden, 2007), Spanish (Jaber et al., 1997) and Nigerian (Uti and Fashina, 2006) studies. The least reported causative factor in these Nigerian and Spanish studies were poor oral hygiene and betel nut chewing respectively. However, the least reported causative factor for oral cancer in our study was dietary factors. More number of Indian students reported chewing tobacco, compared to cigarette smoking and other responses, as a causative factor for oral cancer and this may be due to the fact that chewing tobacco is common in India. A case-control study conducted by Balaram et al. (2002) confirmed that paan-tobacco chewing was the most important determinant of oral cancer in Southern India. Our sample of Indian dental students was drawn from a South Indian university.

Color change and ulcerations was reported as signs and symptoms of oral cancer by majority of our respondents with lymphadenopathy being the least reported signs of oral cancer. Majority of Spanish students reported oral cancer being speckled and painless and parasthesia as an additional feature (Jaber et al., 1997) whereas, majority of Nigerian students reported oral cancer being red, white and speckled with occasional pain, and weight loss and lymphadenopathy as additional features (Uti and Fashina, 2006). Speech defect was the least reported feature among these Nigerian students whereas dysphonia, which is impairment in the ability to produce voice, was the least reported feature among these Spanish students. However, speech defects/dysphonia was not considered as a feature of oral cancer by our respondents.

A dedicated TUC program may not be included in the dental curricula of the universities surveyed in India, Saudi Arabia, Yemen and UAE, which may have influenced the students' perception of TUC counseling. This is reflected in the results of our study which showed a higher percentage of respondents disagreeing or strongly disagreeing with the TUC statements. While majority of

respondents in our study believed that cigarette smoking is one of the etiological factors for oral cancer, their attitudes towards TUC counseling were poor. This is in agreement with the results of a study conducted among Nigerian dentists and dental students (Uti and Sofola, 2011). Moreover, majority of respondents have also reported only a 'slight need' or 'no need' for further education in oral cancer and TUC counseling. Even though only a few students reported a positive current smoking status, the perception of both smokers and non-smokers towards TUC counseling were poor. This is not in concurrence with the results of studies conducted among Greek and Iranian dental students (Polychonopoulou et al., 2004; Ahmady et al., 2011). The non-smokers in these studies were more likely to endorse TUC services than smokers.

Some limitations of this study should be considered when interpreting the results. The study sample was relatively small compared to the total number of dental students in India, Saudi Arabia, UAE and Yemen. Furthermore, the results were derived from self-reported data. Hence, it may have limited generalizability. Several cross-sectional questionnaire-based studies conducted among dental students evaluating the awareness of oral cancer had included questions related to TUC counseling (Jaber et al., 1997; Uti and Fashina, 2006; Carter and Ogden, 2007; Ogden and Mahboobi, 2011) but the study conducted by Chowdhury et al. (2010) had given equal importance in evaluating the awareness of oral cancer and attitudes towards tobacco control among dental students. This Bangladeshi study used the Global Health Professionals Student Survey (GHPSS) instrument for evaluating TUC counseling and the modified 32-item Humphris Oral Cancer Knowledge Scale (HOCKS) for evaluating oral cancer awareness. Our study only intended to gather baseline assessment data from the students' perspective concerning their awareness of oral cancer and perception of TUC counseling and thus, did not use a standardized questionnaire. The response to oral cancer awareness questions and TUC counseling statements may vary according to the gender of the students. However, this topic was not analyzed in this study.

To conclude, our findings confirm previously reported data with respect to the prevalence of smoking among dental students and oral cancer awareness. Oral cancer awareness was better among clinical students compared to pre-clinical students. Based on all the parameters used in our study, the TUC counseling perception of students was poor. Furthermore, a higher level of oral cancer awareness did not have a positive impact on the perception of TUC counseling. Hence, the respective dental councils of the countries surveyed should give due importance to the results of this study and take necessary steps in preparing dental students for an integrated approach towards oral cancer prevention and TUC counseling.

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