

Oral cancer screening experiences, practices and beliefs of prosthodontists in Saudi Arabia: A survey study

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Abstract

Background: Age is known to be a risk factor for oral cancer; older patients visit prosthodontists very regularly, so the prosthodontists may help in the prevention and early detection of any suspicious mucosal alteration in this high-risk group. The aim of this study was to assess the beliefs, experiences and practices of prosthodontists regarding oral cancer screening.

Method: A cross-sectional, questionnaire-based survey was conducted on prosthodontists practicing in Saudi Arabia. A 26-item questionnaire was sent to all eligible prosthodontists (n=250). The collected data was analyzed using SPSS 21.0.

Results: The response rate was 57.2% (n=143). The majority of participants (79.70%) reported that they routinely examine all new patients for mucosal pathologies. However, only 58% reported that they examine their patients at recall visits, and only 61.5% stated that they provide tobacco cessation advice. With regard to the respondents experiences with suspicious mucosal lesions, the majority said that they had detected a suspicious lesion (79.9%) and had referred affected patients (83.2 %) during their career. Unfortunately, just 65% of prosthodontists believed that they could detect oral cancer on their own, and only 40% believed that they could influence their patients to quit smoking. A lack of training, confidence, time and financial incentives were reported as barriers to oral cancer screening.

Conclusion: Most of the prosthodontists surveyed in this study seem motivated to perform routine oral mucosal screening. However, more efforts are needed to help improve the attitudes, confidence and skills of prosthodontists when it comes to identifying and referring suspicious oral mucosal lesions.

Background

Oral cancer (OC) refers to all malignant tumors that affect the tissues of the oral cavity [1]. It is a prevalent health problem, being the 18th most common cancer worldwide and accounting for 2% of all cancers [2]. Notably, the incidence and mortality rates of OC are far higher in developing countries when compared to developed countries [2]. Over 90% of OC cases are squamous cell carcinomas [1]. The etiopathogenesis of OC is quite complex and multifactorial, but the most critical risk factors associated with the disease include tobacco use, excess alcohol consumption, sun exposure (for lip cancer), advanced age, papilloma virus (especially for oropharyngeal cancers) and genetic predisposition [1–6].

Unfortunately, despite the significant advancement in medical health care, the mortality rate of OC remains high [7]. This is attributed to the fact that most OC cases are presented in the later stages, mostly stages III and IV [7].

Survival rates largely depend on the stage of the disease; stage III and IV cancers have the poorest prognosis, with 5-year survival rates of 41% and 9% respectively, while stages I and II cancers have higher survival rates of 85% and 66% respectively [8]. Early detection of OC, therefore, can significantly improve the prognosis outcomes and thus reduce the negative implications of the disease. Oral squamous cell

carcinomas are usually preceded by visible mucosal alterations, which are known as premalignant lesions or oral potentially malignant lesions [9]. These can be easily detected by the dental practitioner during a routine dental examination, or even by the patients themselves.

Dental practitioners can play a pivotal role in the early identification of oral cancer/potentially malignant oral lesions, which in turn leads to earlier intervention and better overall management outcomes. Many studies worldwide have assessed the knowledge and practices of dentists regarding oral cancer and showed unsatisfactory results [10–14]. Among dental practitioners, dental prosthodontists - dental practitioners who specialize in providing dentures for edentulous patients – are able to play a crucial role in the prevention and early detection of OC through opportunistic screening of oral mucosa in edentulous older adults [15]. Age is known to be a risk factor for OC, and data suggests that over 90% of OC cases occur in patients who are aged 55 or older. With this said, dental prosthodontists can help significantly in the prevention and early detection of any suspicious mucosal alteration in this high-risk group. Unfortunately, data concerning the knowledge and practices of dental prosthodontists regarding OC are limited, with only one study available in the literature (Allen K, Farah, 2014). The purpose of this study, therefore, was to assess the knowledge and screening practices of oral cancer and potentially malignant oral lesions among prosthodontists in Saudi Arabia.

Methods

A questionnaire-based cross-sectional study was conducted between March and May of 2019. All prosthodontists who registered at the Saudi Commission for Health Specialties were eligible for participation. The study was approved by the Institutional Review Board (IRB), College of Dentistry, Taibah University (TUCDREC/20190202), and was conducted in accordance with the guidelines of the Declaration of Helsinki. An informed consent was taken from each participant. We used a closed-ended questionnaire containing 26 questions that was used by a previous study [15]. The questionnaire was first pilot tested on a group of prosthodontists to ensure its clarity and understandability. The questionnaire comprised both close-ended and partially closed-ended questions, which were divided into three main categories (supplementary file):

Demographics and professional data

Prosthodontist experience with oral mucosal screening and referral (8 main questions)

Prosthodontist beliefs on oral mucosal screening and perceived barriers (18 main questions)

The questionnaire was created as an online version using Google Drive and the link was emailed to all potential participants (n = 250). The email explained the aims and methods of the study, as well as assuring participants that their identities would remain anonymous and that all information given would stay confidential and be used for research purposes only. Reminder emails were sent to all candidates after 2, 4 and 6 weeks. Responses were collected using the Google Drive Excel document and data was entered into SPSS 21 software (SPSS Inc., Chicago, IL, USA). The data was presented as frequencies and

percentages, and the Chi-square test was used to make comparisons between groups. A P-value < 0.05 was set to be statistically significant.

Results

Of the 250 prosthodontists who were invited to participate, 143 completed the survey, giving a response rate of 57.2%. Of these participants, 74.8% were male, 55% had less than ten years of clinical experience, and 83.9% worked in a public setting (Table 1).

Table 1
Demographic and professional data

	N	%
Gender		
Male	107	74.8
Female	36	25.2
Qualification		
Master	49	34.3
Board	42	29.4
PhD	52	36.4
Experience		
≤ 10 years	79	55.2
≥ 10 years	64	44.8
Setting		
Public	120	83.9
Private clinic	23	16.1

Table 2 illustrates the practices and experiences of oral cancer screening. While the majority of respondents (79%) reported that they examine all new patients for mucosal lesions, only 58% examine their patients at recall visits, and just 62% reported targeting their screening towards patients at high risk of oral cancer. With regard to respondents' experiences with mucosal suspicious lesions, the majority (79.7%) reported that they had detected a suspicious lesion, and 83.2% had referred patients with a suspicious lesion. Unfortunately, only 61.5% of prosthodontists always advise their patients to quit smoking. Additionally, only 23.8% use OC screening diagnostic aids for mucosal screening, despite 67.8% of participants having knowledge about such aids (Table 2).

Table 2
Prosthodontist experience with oral mucosal screening and referral

Question	Yes N(%)	No N(%)
Have you ever detected a suspicious lesion?	114 (79.7)	29 (20.3)
Have you ever referred a patient with a suspicious lesion?	119 (83.2)	24 (16.8)
Do you check all new patients for mucosal pathology?	113 (79.0)	30 (21.0)
Do you check all recall patients for mucosal pathology?	83 (58.0)	60 (42.0)
Do you target mucosal screening to those at risk of oral cancer?	89 (62.2)	54 (37.8)
Do you give smoking cessation advice?	88 (61.5)	55 (38.5)
Do you know of any diagnostic aids that may assist in screening?	97 (67.8)	46 (32.2)
Do you use diagnostic aids to assist mucosal screening?	34 (23.8)	109 (76.2)

Table 3 demonstrates the effect that clinical experience has on the prosthodontists' experience with oral mucosal screening and referral. The results show that prosthodontists with a greater amount of clinical experience (at least 10 years) are more able to detect and refer patients with a suspicious lesion when compared to those who have recently graduated, and this was a statistically significant result (Table 3).

Table 3

the effect of experience years on the Prosthodontist experience with oral mucosal screening and referral

Question	Less than 10 years		More than 10 years		P-value
	Yes %	No %	Yes %	No %	
Have you ever detected a suspicious lesion?	70.90	29.10	90.60	9.40	.004*
Have you ever referred a patient with a suspicious lesion?	77.20	22.80	90.60	9.40	.033*
Do you check all new patients for mucosal pathology?	79.70	20.30	78.10	21.90	0.813
Do you check all recall patients for mucosal pathology?	57.00	43.00	59.40	40.60	0.771
Do you target mucosal screening to those at risk of oral cancer?	57.00	43.00	68.80	31.30	0.148
Do you give smoking cessation advice?	67.10	32.90	54.70	45.30	0.13
Do you know of any diagnostic aids that may assist in screening?	64.60	35.40	71.90	28.10	0.352
Do you use diagnostic aids to assist mucosal screening?	21.50	78.50	26.60	73.40	0.481

Table 4 summarizes the opinions and beliefs of prosthodontists on oral mucosal screening and referral. The vast majority believe that an oral mucosal examination should occur for both new and recall visit patients (96.5% and 84.6% respectively). Additionally, most respondents think that oral screening should be targeted at those who are at risk of cancer (84.6%) and that patients referred for oral mucosal pathology should be followed up (89.5%). Only 58% believe that they are capable of detecting oral cancer on their own.

Table 4
Prosthodontist beliefs on oral mucosal screening and referral

Question	Agree N(%)	Disagree N(%)	Neutral N(%)
Checking of oral mucosal soft tissues should occur at new patient appointments	138 (96.5)	0 (0)	5 (3.5)
Checking of oral mucosal soft tissues should occur at recall patient appointments	121 (84.6)	2 (1.4)	20 (14)
Checking of oral mucosal soft tissues should be targeted to those at risk	122 (85.3)	6 (4.2)	15 (10.5)
Patients will detect mucosal pathology on their own	29 (20.3)	69 (48.3)	45 (31.5)
You will be able to detect oral cancer in your practicing career	83 (58)	3 (2.1)	57 (39.9)
Patient referrals for oral mucosal pathology should be followed up	128 (89.5)	0 (0)	15 10.5)
Patients will promptly attend specialist appointments when referred	92 (64.3)	3 (2.1)	48 (33.6)
You can influence a patient to quit smoking	62 (43.4)	8 (5.6)	73 (51)
You should provide smoking cessation counseling/advice	85 (59.4)	14 (9.8)	44 (30.8)
You are comfortable discussing the presence of a suspicious lesion with a patient	83 (58)	14 (9.8)	46 (32.2)
It is the role of the dentist to screen for oral mucosal pathology	127 (88.8)	0 (0)	16 (11.2)
It is the role of dental hygienists to screen for oral mucosal pathology	104 (72.7)	12 (8.4)	27 (18.9)
It is the role of dental prosthodontist to screen for oral mucosal pathology	103 (72)	8 (5.6)	32 (22.4)
It is the role of medical doctors to screen for oral mucosal pathology	95 (66.4)	12 (8.4)	36 (25.2)

The majority (88.8%) agree that it is the role of dentists or prosthodontists to screen for oral pathologies, but only 58% feel comfortable discussing the presence of a suspicious lesion with the patient. What's more, only 60% of respondents believe that it is the responsibility of prosthodontists to provide smoking cessation advice, and 43.4% think that they can influence their patients to quit smoking (Table 4).

Generally, recently graduated prosthodontists (less than ten years of experience) showed significantly better attitude, positive beliefs and greater confidence regarding oral cancer screening and providing smoking cessation advice in comparison to those with longer clinical experience (Table 5).

Table 5

The effect of experience years on prosthodontist beliefs on oral mucosal screening and referral.

Question	Less than 10 years			More than 10 years			
	Agree	Disagree	Neutral	Agree	Disagree	Neutral	
Checking of oral mucosal soft tissues should occur at new patient appointments	100.00	0.00	0.00	92.20	0.00	7.80	.011*
Checking of oral mucosal soft tissues should occur at recall patient appointments	82.30	0.00	17.70	87.50	3.10	9.40	.114
Checking of oral mucosal soft tissues should be targeted to those at risk	77.20	7.60	15.20	95.30	0.00	4.70	.007*
Patients will detect mucosal pathology on their own	21.50	32.90	45.60	18.80	67.20	14.10	.000*
You will be able to detect oral cancer in your practicing career	65.80	0.00	34.20	48.40	4.70	46.90	.031*,
Patient referrals for oral mucosal pathology should be followed up	92.40	0.00	7.60	85.90	0.00	14.10	0.209
Patients will promptly attend specialist appointments when referred	60.80	3.80	35.40	68.80	0.00	31.30	.227a
You can influence a patient to quit smoking	40.50	0.00	59.50	46.90	12.50	40.60	.002*, a
You should provide smoking cessation counseling/advice	67.10	0.00	32.90	50.00	21.90	28.10	.000*
You are comfortable discussing the presence of a suspicious lesion with a patient	64.60	3.80	31.60	50.00	17.20	32.80	.020*
It is the role of the dentist to screen for oral mucosal pathology	91.10	0.00	8.90	85.90	0.00	14.10	0.326
It is the role of dental hygienists to screen for oral mucosal pathology	75.90	3.80	20.30	68.80	14.10	17.20	0.088

Question	Less than 10 years			More than 10 years			
	Agree	Disagree	Neutral	Agree	Disagree	Neutral	
It is the role of dental prosthodontist to screen for oral mucosal pathology	86.10	0.00	13.90	54.70	12.50	32.80	.000*, a
It is the role of medical doctors to screen for oral mucosal pathology	68.40	3.80	27.80	64.10	14.10	21.90	0.081
Question	Agree N(%)	Disagree N(%)	Neutral N(%)				
Lack of clinical time is a barrier to oral mucosal screening	51 (35.7)	46 (32.2)	46 (32.2)				
Lack of financial incentives is a barrier to mucosal screening	49 (34.3)	58 (40.6)	36 (25.2)				
Lack of confidence is a barrier to mucosal screening	65 (45.5)	30 (21)	48 (33.6)				
Lack of training is a barrier to mucosal screening	84 (58.7)	6 (4.2)	53 (37.1)				

Table 6
Perceived
barriers
to oral
cancer
screening

In respect of the perceived barriers to oral cancer screening, more than half of the respondents (58%) agreed that a lack of training presents a barrier. Other perceived barriers included lack of confidence (45.5%), lack of time (35.7%) and lack of financial incentive (34.3%).

Discussion

Intra-oral examination that includes mucosal screening to detect oral malignant or premalignant lesions is of critical importance in the prevention and early detection of oral cancer [16]. The risk of oral cancer increases with age; the average age at diagnosis is 62, and two-thirds of oral cancer patients are over 55 years old, although the disease may occur in younger people as well. According to records of the United Nations, about 600 million (10%) of the world's population were aged 60 years and over in 2000.

This figure is projected to reach 1.2 billion by 2025 [17]. Age is a well-known risk for tooth loss and complete edentulism [18]; the prevalence rate of edentulousness (complete tooth loss) is 6% – 78% among individuals aged 60 years or over [19]. Consequently, prosthodontists (specialists in providing artificial teeth) are expected to be the most frequently visited by older adults out of all oral health care providers. Therefore, prosthodontists can play a crucial role in the early detection and referral of oral cancer cases, thus reducing morbidity and mortality rates.

The present study, the first of its kind in the region, aimed to assess the beliefs, experiences and practices surrounding oral cancer screening among prosthodontists practicing in Saudi Arabia. Overall, the findings of this study revealed that prosthodontists in Saudi Arabia are motivated to conduct screenings and make referrals of suspicious oral mucosa pathologies. However, they lack the adequate training and confidence. The results also showed that recent graduates had better confidence and more positive attitudes towards oral cancer screening.

The main finding in the current study was that most of the surveyed prosthodontists claimed to screen their new patients for oral pathologies and refer them for treatment when necessary. These results are comparable with the findings reported among Australian prosthodontics [15]. Unfortunately, a large proportion of the participants admitted that they do not examine their patients at recall visits. This finding differs from the aforementioned study, in which most prosthodontists reported screening both new and recall patients [15]. Lack of training and confidence were among the identified barriers for routine oral cancer screening - findings which are consistent with previous studies [15, 20]. Therefore, more work is needed to motivate prosthodontists to routinize oral cancer screening and referral.

Concerningly, a considerable proportion of the prosthodontists surveyed were not aware of mucosal screening and diagnostic aids. The majority felt unconfident in their ability to detect suspicious mucosal lesions, suggesting a deficit in professional training. These results highlight the urgent need for continued educational courses on mucosal screening, such as hands-on workshops and regular scientific meetings.

Tobacco is renowned for being a major risk factor for oral cancer and precancerous lesions. Dentists including prosthodontists and other dental health providers are in an ideal position to provide tobacco cessation advice, and thus help reduce the incidence of oral mucosal pathologies. It is disheartening to know that only 61% of the participants in the present study always give tobacco cessation advice, and less than half (43%) believe that they can influence their patients to quit this deleterious habit. These findings are in line with other previous studies elsewhere [15, 20–23]. Such unsatisfactory results can be attributed to the lack of confidence and inadequate training on tobacco cessation counseling, and emphasize the urgent need to launch a training program on tobacco cessation counseling, targeting all prosthodontists and other oral health care providers.

Interestingly, recent graduates revealed better attitudes and more confidence in performing mucosal screening and providing tobacco cessation advice. These findings which corroborate those of previous studies [15, 20, 24]. This can be explained by the fact that recent graduates are still fresh out of their studies, and so tend to be more knowledgeable and motivated compared to those who graduated years

before them. This again underscore the importance of continuous professional courses for all prosthodontists and other dental health care personnel.

This is the first survey that assessed oral mucosal screening practices and beliefs among prosthodontics in Saudi Arabia. However, the results of the present study should be interpreted with caution considering due to some potential methodological limitations. The main limitation of the survey was the relatively low response rate (57.5%). Although this rate is reasonable and comparable to other questionnaire-based surveys among prosthodontists and dentists, this could have introduced a non-response bias into the results that subsequently limits the generalizability of our findings. Thus, it is difficult to generalize the findings to all prosthodontists practising in Saudi Arabia. Additionally, the responses were subjective as a result of the survey being questionnaire-based (self-reported data). As a result, the responses may not accurately reflect actual levels of knowledge and methods of practice. Despite these shortcomings, this study sheds some light on the beliefs and practices of prosthodontists around mucosal screening. It has also highlighted the importance of continuous educational courses for all prosthodontists.

In conclusion, this study has demonstrated that prosthodontists in Saudi Arabia appear to have good motivation and practices regarding oral cancer screening. However, they lack the adequate training and confidence. Periodic, continuous educational courses should be organized to address this deficit in training and to help improve prosthodontists' motivation, confidence and skills in identifying and referring suspicious mucosal lesions.

Abbreviations

OC

Oral cancer; IRB:Institutional Review Board

Declarations

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Authors' contribution

AYA, participated in the study conception and design, interpretation of the data, data collection, and drafting the manuscript. SB, AA and SA participated in interpretation of the data and drafting the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets supporting the findings of this article are available from the corresponding author.

Competing of interests

The authors declare that they have no competing of interests.

Consent for publication

Not applicable.

Ethics approval

The study was approved by the Institutional Review Board (IRB), College of Dentistry, Taibah University (TUCDREC/20190202)

Consent to participate

An informed consent was obtained from every participant.

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