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Oral mucosal screening and referral attitudes of Australian oral health therapists and dental hygienists in Queensland

Abstract: *Objectives:* The aim of this study was to describe oral mucosal screening and referral attitudes of Australian oral health therapists (OHTs) and dental hygienists (DHs). *Methods:* Questionnaires were distributed to participants who attended dental hygiene courses run in both regional and metropolitan Queensland. *Results:* One hundred and two participants comprised 58 OHTs and 44 DHs, with a mean of 8.9 years since graduation. Thirty-four participants worked in regional locations, while 68 were from metropolitan areas. 97% of participants agreed that mucosal screening should be performed for all new and recall patients, while a minority (5%) agreed that patients will detect an oral mucosal change themselves. The majority (77%) agreed that oral cancer would be encountered in their practising career. Most participants (81%) felt comfortable discussing the presence of a suspicious lesion with patients and 88% agreed that it was their role to screen. In terms of barriers to oral cancer screening, lack of training was seen as the most prevalent barrier (56%) followed by lack of confidence (51%). Lack of time was seen as the third most prevalent barrier (40%), and lack of financial incentives was the least prevalent barrier (16%). *Conclusions:* Oral health therapists and DHs understand the importance of oral mucosal screening and are likely to be alert to oral mucosal changes. While lack of time and financial incentives was perceived to be impediments to mucosal screening, lack of confidence and training was the most prevalent barriers. This issue should be addressed through implementation of effective continuing education courses targeting oral cancer screening and referral practices.

Key words: dental hygienist; diagnosis; mouth neoplasms; oral health therapist; referral and consultation

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Introduction

Every year, there are about 263 000 new cases of oral cancer and about 127 000 deaths globally (1). In Australia, oral cancer accounts for about 3% of all cancers and approximately 1% of deaths from cancer (2). Recently, an improvement in the 5-year survival rates has been observed for patients with oral cancer from 54.7% to 65.9% (3). Clearly more still can be done to promote greater improvement of survival rates; recognition and treatment of potentially malignant and early malignant lesions are key (2). Despite the oral cavity being accessible to visual inspection,

most cancers are diagnosed at a late stage of disease (4–7). Late detection not only compromises survival, but there is greater possibility for disfigurement and functional disturbances which adversely affect the patient's quality of life post-treatment (8, 9).

Delay in detection is considered to have occurred when a tumour is over 4 cm in diameter or has spread to adjacent tissues or structures (10). Delay in detection may arise due to irregular healthcare attendance by the patient or inadequate screening and referral processes by the practitioner. Oral mucosal screening serves to detect cancer and potentially malignant lesions through visual examination and can be undertaken in as little as 90 s (11). Dentists, OHTs and DHs can perform opportunistic oral mucosal screening during dental examinations (11). Often, asymptomatic lesions are discovered incidentally during dental examination, when the oral soft tissues are checked (12–14). However, even following a routine dental examination, malignant lesions are sometimes missed (14). Both the American and Australian Dental Associations recommend individuals seek a comprehensive oral soft tissue examination regularly, however most patients diagnosed with oral squamous cell carcinoma are not regular dental attendees (15). The inherent rarity of detection of cancerous lesions may mean practitioners are not looking for them, as they do not expect to detect anything suspicious (16). Practitioners are more likely to report performing screening if they have detected a suspicious lesion which was subsequently diagnosed as cancer (11). Performing oral mucosal screening at routine dental appointments is believed to be important in early detection of lesions, yet not all practitioners are doing so (9, 17–19). Barriers to performing screening have been described by doctors and dentists as lack of training, time, confidence and financial incentives (19, 20). In one study, Texan DHs did not perform oral mucosal screening because it was felt to be the responsibility of the supervising dentist (12). Lack of time was cited by hygienists as another factor impeding screening (11). In addition, another study found that when dentists did not screen, DHs also did not screen as they felt it was not encouraged as practice culture (21). Lack of dentist support was proposed as a barrier to oral mucosal screening by DHs from North Carolina (22). This suggests that many DHs do not routinely perform oral mucosal screening.

Oral health therapists in Australia are tertiary qualified oral healthcare practitioners who are involved in dental examination, dental treatment for children and hygiene treatment of patients. They are educated in health promotion and oral disease prevention. These competencies include the ability to perform oral mucosal screening (23, 24). There has been no research to date investigating their experiences with detection and referral of suspicious oral mucosal lesions. In a country such as Australia, the population is spread over great distances and many areas are classified as regional or remote. In these areas, patients tend to be irregular dental attendees (25). Regional practitioners have unique challenges and experiences with mucosal screening and referral, due to limited specialist support mechanisms in these locations. Given the paucity of data available in the literature examining the barriers and triggers to oral mucosal screening by OHTs and DHs in Australia, and given the unique set of circumstances they may experience, we included both regional- and metropolitan-based practitioners in our study. The aim of this study was to describe oral mucosal screening and referral attitudes of Australian OHTs and DHs.

Study population and methodology

Self-administered questionnaires were completed by regional and metropolitan OHTs and DHs on separate occasions. To meet inclusion criteria, participants had to identify themselves as an OHT or a DH and have answered at least 80% of the questionnaire.

Literature review

A literature review identified common barriers and triggers for oral mucosal screening and referral for suspicious lesions. Literature was identified through Medline database search terms 'delay'*or*'*neglect*' or 'wait'*or*'*interval*' or 'barrier'*or*'*trigger*' or 'seek'*or*'*opinion*' or 'attitude'*or*'*experience*' combined with 'refer'*or*'*doctor*' or 'medical'*or*'*patient*' or 'practitioner'*or*'*dent*' or 'screen'*or*'*detect*' or 'manage'*or*'*prevent*' combined with 'oral' or 'mouth' or 'head' combined with MESH search terms 'precancerous conditions' or 'mouth neoplasms' or 'oral leukoplakia' or 'squamous cell carcinoma' or 'erythroplasia'. The search was limited to English language articles published between 1989 and 2013. The bibliographies of articles identified as relevant were also reviewed for additional relevant sources. Studies were included if they met the following inclusion criteria: (i) they related to oral or lip cancer, (ii) they investigated reasons for either patient or practitioner delay and (iii) they were in the form of either review articles or presented original data from observational studies. The goals of this literature review were to analyse currently available data on the barriers and triggers to patient help-seeking behaviour and to investigate practitioner-related factors resulting in treatment delays.

Development of questionnaire

A questionnaire that could assess oral mucosal screening habits and beliefs of dental practitioners was required. Available data on practitioner screening habits and beliefs were used to develop a 38-item questionnaire for the purposes of this study. The first section of the questionnaire sought background information including practitioner type (OHT, DH, dental therapist dentist, dental prosthetist or other), year of graduation, year of birth, gender and postcode. The second section was headed 'how strongly do you agree with the following' and gathered information on practitioner beliefs regarding oral mucosal screening, oral cancer detection, smoking cessation and patient referral. Data for the second section were collected through Likert scale (strongly agree, agree, neutral, disagree, strongly disagree). The third section sought information regarding practitioner experience with detection and referral of oral mucosal

pathology through yes/no answers and open text where appropriate. The fourth section of the questionnaire sought information regarding perceived effectiveness of the continuing education course, and data were collected through Likert scale. Survey content was validated through the literature review and expert opinion of an oral medicine specialist (author CSF). Ethical clearance was granted by the University of Queensland Dental Science Research Ethics Committee, clearance number 1201.

Data collection 1

The initial questionnaire was distributed to a sample of OHTs and DHs in regional Queensland. Participants of the study were recruited through their attendance at a road show workshop targeted at regional members of the Dental Hygienists' Association of Australia (DHAAQ). The road show workshop comprised a series of lectures undertaken by an oral medicine specialist (CSF) on a range of topics related to oral cancer and potentially malignant lesions including changes in aetiology, detection methods, adjunctive aids and referral pathways and was run in Townsville, Rockhampton and Cairns. These regional locations are 643, 1357 and 1712 km away from Queensland's capital city of Brisbane. Practitioners from these locations and their surrounds have limited access to local continuing education courses and had not had oral cancer covered in the recent past. Data on beliefs and experiences surrounding oral mucosal screening and referral were collected after an oral mucosal pathology and screening lecture. The questionnaire was completed by all participants of the oral mucosal screening workshop which included responses from dentists, OHTs, DHs, dental therapists, students and other participants. For the purpose of this study, only responses from DHs and OHTs were included. The questionnaire was completed anonymously by participants who did not receive an incentive for completion of the survey. Questions asked included practitioner beliefs regarding patient self-detection, when oral mucosal screening should be performed, patient follow-up, perception of barriers to mucosal screening, whose role it is to perform mucosal screening, past experiences in detection and an evaluation of the workshop effectiveness. Following data collection, it became apparent through the open-text responses that some participants did not feel supported by other oral health professionals.

Revised questionnaire

The questionnaire was revised following feedback from participants from the first questionnaire. A small number of OHTs and DHs had left comments in the open-text section of the questionnaire denoting lack of cohesiveness within the dental team. For this reason, three questions were added to the third section to gather data on whether participants felt that their clinical judgement was supported by dentists, whether they received feedback regarding oral mucosal pathology and whether they wished to receive feedback regarding oral mucosal pathology by dentists. Also, as the second cohort did not attend an oral mucosal pathology lecture and workshop, the fourth section of the initial questionnaire relating to course evaluation was not included in the revised questionnaire.

Data collection 2

The revised questionnaire was distributed to attendees of a different DHAAQ course held in Mooloolaba, metropolitan Brisbane. Survey distribution and completion for metropolitan participants was similar to the regional cohort, except that the course content did not focus on oral mucosal lesions.

Statistical analysis

Practitioner type, year of graduation and practising location were compared using chi-square tests (GraphPad Prism version 6, GraphPad Software, San Diego, CA, USA), with $P < 0.05$ considered statistically significant. Results are shown as per cent agreement for any particular item unless otherwise specified. Questionnaire data was analysed descriptively as frequencies. Categories were reduced to "agree" and "disagree" from "agree"/"strongly agree" and "disagree"/"strongly disagree".

Results

A total of 102 participants completed the survey, representing 17% of all 587 OHTs and DHs based in Queensland (Australian Health Practitioners Regulation Agency, March 2013). Responses were received from all attendees of regional courses ($n = 34$), resulting in a response rate of 100% from this cohort. Responses were received from 68 of 107 attendees of the metropolitan course, resulting in a response rate of 64% from this cohort. Table 1 displays the respondent characteristics, while Table 2 shows a summary of results.

Table 1. **Oral health therapists (OHT) and DH respondent characteristics**

Characteristic	All respondents	Regional respondents	Metropolitan respondents
Total	102 (100)	34 (33)	68 (67)
Gender			
Female	100 (98)	34 (100)	66 (97)
Male	2 (2)		2 (3)
Title			
OHT	58 (57)	22 (65)	36 (53)
DH	44 (43)	12 (35)	32 (47)
Graduation year			
<2000	29 (28)	11 (32)	18 (26)
>2000	70 (67)	23 (68)	47 (69)
Missing	3 (3)		3 (4)

Data are reported as *n* (%).
No statistically significant differences between groups using chi-square contingency tables.

Table 2. **Attitudes of oral health therapists (OHTs) and DHs towards oral mucosal screening and referral**

Statement	Agree	Neutral	Disagree
Screening should be performed for all new patients			
Total	102 (100)		
Screening should be performed for all recall patients			
Total	99 (97)	1 (1)	2 (2)
Screening should be targeted to those at risk	85 (84)	6 (6)	10 (10)
Oral cancer will be detected during practising career			
Total	79 (77)	23 (23)	
Regional*	31 (91)*	3 (9)*	
Metropolitan*	48 (71)*	20 (29)*	
Patients will detect a mucosal change on their own			
Total	5 (5)	18 (18)	79 (77)
It is the OHT and DHs' role to screen			
Total	90 (88)	9 (9)	3 (3)
Lack of training is a barrier to mucosal screening			
Total	57 (56)	20 (20)	25 (24)
Regional*	23 (68)	8 (23)	3 (9)
Metropolitan*	34 (50)	12 (18)	22 (32)
Lack of confidence is a barrier to mucosal screening			
Total	52 (51)	24 (24)	26 (25)
OHT*	35 (61)	11 (19)	11 (19)
DH*	16 (36)	13 (30)	15 (34)
Lack of time is a barrier to mucosal screening			
Total	41 (40)	15 (15)	46 (45)
Lack of financial incentives is a barrier to mucosal screening			
Total	16 (16)	19 (18)	67 (66)
Patients will promptly enact referrals			
Total	40 (39)	34 (33)	28 (27)
Regional*	8 (24)	12 (35)	14 (41)
Metropolitan*	32 (47)	22 (32)	14 (21)
Patients should be followed up once referred			
Total	93 (91)	7 (7)	2 (2)
You are comfortable in discussing the presence of a suspicious mucosal lesion			
Total	83 (81)	13 (13)	6 (6)
OHT*	41 (72)	11 (19)	5 (9)
DH*	41 (93)	2 (5)	1 (2)
You can influence a patient to quit smoking or drinking alcohol			
Total	80 (78)	18 (18)	4 (4)
You should try to influence a patient to quit smoking or drinking alcohol			
Total	89 (87)	12 (12)	1 (1)
Your clinical judgement is supported by dentists			
Total (metropolitan only)	64 (94)		4 (6)
You receive feedback regarding oral mucosal pathology			
Total (metropolitan only)	53 (82)		12 (18)
You wish to receive feedback regarding oral mucosal pathology			
Total (metropolitan only)	63 (95)		3 (5)

Data are reported as *n* (% agreement).
Statistically significant ($P < 0.05$) differences are denoted with an*.

Screening

All (100%) participants agreed oral mucosal screening should be performed for all new patients, 99 (97%) agreed it should be performed for all recall patients and 85 of 102 respondents (84%) agreed it should be targeted to individuals at risk. Most participants ($n = 80$, 78%) agreed that they could influence a patient to quit smoking or drinking alcohol and 89 (87%) agreed that they should try to influence a patient to quit smoking or drinking alcohol.

In regard to encountering oral cancer, 79 (77%) of participants agreed that they would detect it in their practising career and the other 23 (23%) participants remained neutral. Regional practitioners were significantly more likely to agree with the statement that oral cancer would be detected in their practising career ($P < 0.05$). Only 5 (5%) of OHTs and DHs agreed patients would detect a mucosal change on their own. Most participants ($n = 90$, 88%) agreed it was their role to perform mucosal screening and only 3 (3%) of the remaining participants disagreed.

Barriers

Lack of training was perceived as a barrier to mucosal screening by 57 (56%) participants. Beliefs about whether lack of training was a barrier to oral mucosal screening were highly correlated with geography ($P < 0.05$). Regional practitioners were significantly more likely to view lack of training as a barrier compared with their metropolitan colleagues. Lack of confidence was seen as a barrier by 52 (51%) participants. Beliefs about whether lack of confidence was a barrier to oral mucosal screening were highly correlated with practitioner type ($P < 0.05$). Oral health therapists were significantly more likely to view lack of confidence as a barrier compared with DHs. Lack of clinical time was seen as a barrier to screening by 41 (40%) participants, and lack of financial incentives was seen as a barrier to screening by 16 (16%) participants.

Referral

Overall, 40 (39%) participants agreed patients would promptly enact referrals. Metropolitan practitioners were significantly more likely to agree that patients would promptly use referrals compared with their regional counterparts ($P < 0.05$). Most participants ($n = 93$, 91%) agreed that referrals for oral pathology should be followed up. Of note, 83 (81%) participants felt comfortable discussing the presence of suspicious mucosal lesions with their patients. Oral health therapists were significantly more likely to agree that they felt comfortable discussing the presence of suspicious lesions than DHs ($P < 0.05$). Regarding past experiences, 85 (83%) participants report detecting a suspicious lesion, yet only 75 of 101 (74%) respondents had referred. In Australia, OHTs and DHs will first refer suspected pathology to a supervising dentist who then decides whether to issue a referral to a specialist.

It is expected that all participants who had detected a suspicious lesion would have referred, but this was not the case. While the reasons are unknown, one of the regional participants who detected lesions but did not refer left the following message in an open-text box:

> I feel as though even though I detect suspicious lesions in a patient, most dentists will disregard what I

> detected. I'm not sure whether it's because what I'm detecting is not significant oral pathology or whether there's ignorance within my dental team.

Metropolitan participants (n = 64, 94%) who completed the questionnaire with the additional questions regarding support from dentists agreed that their clinical judgement was supported by dentists. Of those who answered, 53 (82%) had received feedback from dentists regarding oral mucosal pathology and 63 (95%) participants wished to receive feedback from dentists regarding oral mucosal pathology.

Understanding of oral pathology and screening

All regional OHTs and DHs agreed their understanding of oral pathology and screening had improved after attending the oral pathology workshop, and most agreed they would screen differently and more often (88% and 77%, respectively). Ninety-four per cent of OHTs and DHs also indicated they wanted more education regarding oral mucosal pathology and 77% wanted more education on oral mucosal screening.

Discussion

A dental examination should include oral mucosal screening to aid in the detection of precancerous and cancerous lesions (12–14). Screening asymptomatic patients at routine dental appointments may not alter disease-specific mortality, although oral mucosal screening can detect lesions at an early stage (26). Intention to perform behaviours is determined by the person's attitudes, beliefs about other people's expectations and their perceived ability to perform the behaviour (27). In this study, OHTs' and DHs' attitudes towards screening were positive, with most agreeing that oral mucosal screening should be performed at dental examinations. There is a paucity of existing research regarding oral mucosal screening habits of DHs; about two-thirds of DHs in another study claimed to perform oral mucosal screening during oral examination despite nearly all participants believing that it should be performed (28). Believing that oral mucosal screening should be performed is clearly not enough to persuade practitioners to carry it out for their patients. Practitioners in this study felt responsible for oral mucosal screening, and only a small proportion expected that patients would detect pathology on their own accord. Together, this confirms the motivation of OHTs and DHs as health professionals interested in examining the oral soft tissues for their patients. Regarding smoking and alcohol cessation, most OHTs and DHs believed they could influence a patient to quit smoking or drinking and believed that they should try. Practitioner belief that their cessation advice will be heeded is important, as they are unlikely to attempt smoking cessation if they foresaw that patients would not listen to their advice.

Most OHTs and DHs expected to detect cancer in their practising career, with a higher proportion of regional practitioners expecting detection. Regional practitioners may have been more expectant as they had just attended an oral pathology and screening workshop, heightening their awareness of oral cancer. Although detection rates for oral cancer are rare, practitioners are unlikely to undertake a soft tissue examination if they do not anticipate to find a suspicious lesion. Continuing education courses have been shown to have a significant influence on oral cancer prevention behaviours by DHs, thus ensuring that oral pathology and screening workshops are frequently made available to dental professionals can help to keep practitioners at an increased vigil (29). Studies investigating practitioner knowledge have shown that recent attendees of oral cancer continuing education courses have greater understanding of oral cancer and are more likely to report performing screening when compared with practitioners who have not (9, 11, 30). Courses have also been shown to be effective in promoting screening methods, with practitioners reporting better screening habits following attendance (31, 32). As not all practitioners will elect to participate in oral cancer-related continuing education courses, making these courses compulsory or even embedding them in other general dentistry courses may help spread the message to more practitioners. Making courses available online may partly overcome the need for regional practitioners to travel to access training.

Barriers that are perceived by health practitioners might impact on their ability to perform screening, overriding good intentions (27). Understanding which barriers are impacting on screening is important to promote behaviours to decrease their impact. Lack of training and lack of confidence were seen to be the most prevalent barriers to oral mucosal screening when compared with lack of time and financial incentives. Not surprisingly, a higher proportion of regional practitioners felt lack of training was a barrier to mucosal screening when compared with metropolitan practitioners. This may be due to the lack of local courses available to this cohort. A higher proportion of OHTs felt that lack of confidence was a barrier to mucosal screening when compared with DHs. As tertiary education to become an OHT was only developed in 1998, it would follow that lack of confidence might be associated with more recent graduation. There was not, however, an association with year of graduation and perception of lack of confidence as a barrier. Lack of training and confidence can be targeted through planning effective undergraduate courses and continuing education. For regional practitioners, courses could be made available through distance online education facilities. To overcome lack of confidence, practitioners could use telemedicine and digital facilities and liaise with an oral medicine specialist for an opinion on the potential nature of the lesion and the need to refer. This would increase confidence in detection and limit unwarranted specialist referrals and patient expense.

Practitioners should follow up with patients who are referred to ensure they are seen by a specialist in a timely manner, as patients can delay enacting referrals (31–34). This is especially critical in regional areas because patients often have a lack of continuity in dental appointments (25). Participants in this study showed an understanding of the need to follow up with patients, consequently they may wish to follow up with

patients to serve as a gentle reminder to enact their referral. Their comfort in discussing the presence of a suspicious lesion renders them more likely to communicate effectively with the patient. It was concerning that not all participants who had detected a suspicious lesion had also referred. In Australia, OHTs and DHs must first refer suspected pathology to a supervising dentist who then decides whether to issue a referral to a specialist. It may be that dentists did not agree with what constitutes suspicious pathology. This study suggests that although most dentists do give feedback to OHTs and DHs regarding oral mucosal pathology, more OHTs and DHs wish to receive feedback regarding this. Most OHTs and DHs feel supported by dentists in regard to oral mucosal pathology, but there are a minority who do not. Dental hygienists that do not feel supported by dentists may avoid performing mucosal screening (35). This is an issue that should be targeted, as cohesiveness and communication within the dental team will benefit patient treatment.

Limitations of this study include the different nature of courses the survey was distributed at in both regional and metropolitan areas and that the questionnaire was administered only following course completion. Those participants who attend an oral mucosal pathology lecture are likely to have a bias towards reporting good screening habits. As there are limited courses available in regional areas, and given that in Australia completing 20 h of continuing professional development a year is compulsory, this workshop may have captured most practitioners out of convenience rather than interest.

The findings of this study are applicable to Australian OHTs and DHs, although may not represent opinions of all OHTs or DHs. This is an area of study that needs clarification, as it may have implications for scope of practice, education and workforce planning. Further research should be undertaken to ascertain perceptions and experience of OHTs and DHs on a wider demographical scale, including OHTs and DHs Australia wide. Understanding the attitude and perceptions of other members of the dental team in addition to patient perspectives would also help to complete the picture of oral mucosal screening and referral.

Conclusion

This study found that Australian OHTs and DHs see oral mucosal screening as an important part of dental examination. They place the responsibility on themselves to detect lesions and appropriately manage referrals. Lack of training and confidence was the most prevalent barriers to oral mucosal screening. These may be targeted through undergraduate and continuing education courses.

Clinical relevance

This study was performed to understand the perceptions and experiences of OHTs and DHs regarding oral mucosal screening and referral. An appreciation of beliefs and perceived barriers and triggers to oral mucosal screening can be used to predict the intent and ability of participants to screen their patients for potentially malignant pathology. Previous research has identified barriers to oral mucosal screening from the perspective of the general dentist and doctor. This study focused on OHTs and DHs as they are members of the dental team involved in examination and care of patients and whose perceptions and experience surrounding oral mucosal screening and referral have not yet been explored. Telemedicine and institution of courses available through distance education may help to overcome geographical barriers to referral and access to continuing education courses.

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