Referrals by general dental practitioners and medical practitioners to oral medicine specialists in New Zealand: a study to develop protocol guidelines

Guangzhao Guan, BDS, MBChB, DClinDent,[a] Jessica Lau, BDS,[a] Vanessa Yew, BDS,[a] Jiayun U, BDS,[a] Wenwen Qu, MBChB, PhD,[b] Jacky Lam, BDS, MBA,[c] Ajith Polonowita, BDS, MDS,[a] and Li Mei, BDS, MDS, DDS, PhD[d]

Objective. The aim of this study was to examine the awareness level among general dental practitioners and medical practitioners with regard to common oral mucosal diseases and orofacial pain, investigate their orofacial screening and oral medicine referral practices, assess the information to be included in the referral, and evaluate the perceived need for supplementary resources and guidelines for referral.

Study Design. In total, 51 general dental practitioners and medical practitioners were recruited to investigate their orofacial screening and oral medicine referral practices. Three oral medicine specialists were interviewed to understand the referrals received from dentists and physicians.

Results. Of the participants, 87.5% dentists and 52.6% physicians considered orofacial screening as treatment priority. However, 71.9% dentists performed orofacial screening routinely, whereas none of the physicians did. Of the dentists, 50% referred relevant patients to oral medicine specialists every time they encountered such cases, and 31.6% of the physicians did so. Referrals should include the patient's background and medical history, full descriptions of the lesions, and results and photos from special tests. Of the participants, 65.6% of the dentists and 78.9% of the physicians believed that continuing professional development courses in oral medicine would be beneficial, and 93.8% of the dentists and 89.5% of the physicians agreed that standardized national referral guidelines would be useful.

Conclusions. Standardized national referral guidelines, as well as continuing professional development courses in oral medicine, would be helpful to dental practitioners in the management of patients. (Oral Surg Oral Med Oral Pathol Oral Radiol 2020;130:43−51)

Oral medicine is a specialty in dentistry dealing with the diagnosis and non-surgical management of chronic, recurrent, and medically related disorders of the oral and maxillofacial region.[1] Oral medicine can be considered an interface between medicine and dentistry.[2] The soft and hard tissues of the orofacial region are continuously exposed to physical and chemical challenges throughout a person's lifetime and to aging-related processes, such as cellular aging and immunosenescence.[3] Lesions or conditions from the orofacial region may range from the most innocuous tissue aberrations to malignant tumors.[4] Patients are generally not aware of oral medicine services and usually are seen previously by at least one other health care practitioner before being referred to an oral medicine clinic.[5,6] Patients may be referred for an oral medicine consultation for several reasons, such as oral manifestations of systemic diseases, extraoral or intraoral lesions of concern that are outside the scope of the referring practitioner, orofacial pain that is difficult to manage, oral ulceration of a suspicious nature, and salivary gland−related diseases.[5]

Oral mucosal diseases and orofacial pain can have a great impact on oral health−related quality of life and result in various problems, such as pain, functional limitation, physical and social inability, incapacity, psychological disability, and psychological distress.[7] A comprehensive orofacial screening is important for early detection and diagnosis of orofacial diseases, especially malignancy, before it is too late for successful treatment. This helps prevent further complications and invasive treatment, reduce the duration of treatment and hospital costs, and, most importantly, improve survival.[8] The first contact for most of the patients is commonly with a general medical practitioner.[9] Examination of the orofacial region should be

Statement of Clinical Relevance

Oral mucosal diseases and orofacial pain screening awareness should be raised among general dental practitioners and medical practitioners. Standardized oral medicine referral guidelines should be developed to enhance the efficiency and effectiveness of patient management and the referral process.

[a]Department of Oral Diagnostic and Surgical Sciences, Faculty of Dentistry, University of Otago, Dunedin, New Zealand.
[b]Department of Gynaecology, West China Second University Hospital, Sichuan University, Chengdu, China.
[c]Smile Dental Ltd., Auckland, New Zealand.
[d]Department of Oral Sciences, Faculty of Dentistry, University of Otago, Dunedin, New Zealand.
Received for publication Nov 16, 2019; returned for revision Mar 22, 2020; accepted for publication Mar 31, 2020.
© 2020 Elsevier Inc. All rights reserved.
2212-4403/$-see front matter
https://doi.org/10.1016/j.oooo.2020.03.050

done on a routine basis. However, a study by Jovanović et al. showed that 56% of the physicians did not feel confident about examining the oral cavity and that 77% of them did not think they had enough training to perform an oral examination.[10] Physicians refer patients with oral mucosal diseases and orofacial pain more frequently to other medical specialists rather than to dentists or oral medicine specialists, who are better equipped to handle these conditions effectively. It is, however, important that general dental practitioners, who are the first line of defense in the early detection of oral mucosal diseases and orofacial pain, be well trained to perform a thorough head and neck examination to identify any abnormalities of both soft and hard tissues of the oral region. Basic examination of those who routinely visit a dentist provides an ideal opportunity to discover oral mucosal diseases and orofacial pain in the early stages.[11]

Currently, there are only a few studies on the confidence level of general dental practitioners and medical practitioners in assessing and diagnosing oral mucosal diseases and orofacial pain and on their pattern of referring patients to oral medicine specialists. In addition, there are no available reports from New Zealand on the awareness of general dental practitioners and medical practitioners regarding oral mucosal diseases and orofacial pain. Besides, there are no reports of studies on the oral medicine referral protocol in New Zealand.

Therefore, this study was conducted with 4 aims, as stated below: (1) to examine the level of awareness among general dental practitioners and medical practitioners regarding common oral mucosal diseases and orofacial pain; (2) to investigate their orofacial screening and oral medicine referral practices; (3) to assess the information to be included in an oral medicine referral; and (4) to evaluate the perceived need for supplementary resources and guidelines in referral.

MATERIALS AND METHODS

Ethics approval for the study was granted by the Institutional Ethics Committee (D19/181). This was a cross-sectional study that used quantitative and qualitative methods to observe and analyze the data obtained from general dental practitioners and medical practitioners and oral medicine specialists.

Participants

General dental practitioners and medical practitioners and oral medicine specialists who were registered in New Zealand were included in the study. General dental practitioners and medical practitioners and oral medicine specialists who were not practicing in New Zealand were excluded. The study participants were recruited from 2 regions (Auckland and Dunedin) to represent the 2 main islands of New Zealand. Auckland has the largest population and the largest number of practicing general dental practitioners and medical practitioners and oral medicine specialists, and New Zealand's Faculty of Dentistry is located in Dunedin. According to the 2018-2019 annual report of the Dental Council of New Zealand, 2326 general dental practitioners were practicing in New Zealand.[12] According to the 2018 annual report of the Medical Council of New Zealand, 16,343 general medical practitioners were practicing in New Zealand[13]; however, there were only 5 practicing registered oral medicine specialists in the same period.[14] Three oral medicine specialists were willing to participate in this study. The sample size was based on previous studies and a power analysis.[15,16]

After obtaining informed consent, questionnaires (see Appendix 1 and Appendix 2) were sent to 35 general dental practitioners and 35 general medical practitioners in Auckland and Dunedin. Selected questions were asked to determine the frequency of orofacial screening performed; the practitioners' confidence in identifying oral mucosal diseases and orofacial pain and in providing differential diagnoses before referral; when, how, and to whom they would refer patients with oral mucosal diseases and orofacial pain; and their opinions on the need for standardized national referral guidelines and for further training in the field of oral medicine. The questionnaire required approximately 15 minutes to be completed, and the participants had to provide their answers in English only.

Semi-structured interviews were conducted after obtaining informed consent to collect information about the oral medicine specialists' attitudes toward the current orofacial screening and referral practices of general dental practitioners and medical practitioners. Each interview took approximately 60 minutes and was conducted separately, with the participants wanswering a list of interview questions (see Appendix 3). Interviews were carried out at the workplaces of 2 participants, and 1 interview with a participant in a remote location was carried out over the telephone. The interviews were audio-recorded and analyzed by using the NVivo 12 computer program. The transcripts were reviewed by the participants for accuracy. All data were kept confidential by the research team, and any comments or quotes used were anonymized.

Data analysis

Data obtained from general dental practitioners and medical practitioners were analyzed by using Statistical Package for the Social Sciences (SPSS) version 23 (SPSS Inc., Chicago, IL) and Microsoft Excel (Microsoft Corp, Redmond, WA). Continuous variables were expressed as mean ± standard deviation (SD), if normally distributed, or as median and quartiles, if they had a skewed distribution. Categorical variables were

described as counts and percentages. All the data were deidentified. A bivariate analysis of categorical variables was conducted by using the χ^2 test, and P values were calculated. A P value of less than 0.05 was considered to indicate statistical significance.

The interviews were transcribed verbatim and edited for accuracy in Microsoft Word (Microsoft Corp, Redmond, WA). The transcripts were carefully reviewed and the data evaluated by using thematic analysis. Initially, thematic coding, which involved separating textual data units for manual coding, was performed. The codes were then compared, and patterns from frequent and recurring ideas were used to develop overarching themes and subthemes. The similarities, differences, and relationships among the themes were examined to identify any new themes.

RESULTS

In total, 70 general dental practitioners and medical practitioners were invited to participate in this study. Fifty-one completed questionnaires were received, giving an overall response rate of 72.9%. A comparison of the sociodemographic and educational data of the general dental practitioners (mean age 32.6 ± 12 years) and the medical practitioners (mean age 38.6 ± 11.5 years) is presented in Table I. There were no gender differences between the general dental practitioners and the medical practitioners. Most of the participants worked in the private sector and had greater than 10 years' experience in their fields.

There were only 5 registered oral medicine specialists practicing in New Zealand; 3 oral medicine specialists participated in this study. The demographic data of the oral medicine specialists are presented in Table II.

Table I. Demographic characteristics of the general dental practitioners (GDPs) and general medical practitioners (GPs) included in the study

Demographic characteristics	*GDPs, n (%)*	*GPs, n (%)*
Gender		
Male	14 (43.8%)	10 (52.6%)
Female	18 (56.3%)	9 (47.4%)
Qualification country		
New Zealand	29 (90.6%)	9 (47.4%)
Overseas	3 (9.4%)	10 (52.6%)
Qualifications		
Primary qualification (BDS/MBCHB)	25 (78.1%)	10 (52.6%)
Primary with secondary qualification(s)	7 (21.9%)	9 (47.4%)
Years of experience		
< 2	4 (12.5%)	2 (10.5%)
2–5	7 (21.9%)	4 (21.1%)
6–10	9 (28.1%)	2 (10.5%)
> 10	12 (37.5%)	11 (57.9%)
Practicing sector		
Public	9 (28.1%)	4 (21.1%)
Private	15 (46.9%)	12 (63.2%)
Both	8 (25%)	3 (15.8%)
Total	**32 (100%)**	**19 (100%)**

Theme 1: Opinion on the screening and referral practices for oral mucosal diseases and orofacial pain

Of the study participants, 56.3% of the general dental practitioners and 63.2% of the general medical practitioners, especially respondents from Auckland (60%), believed that oral mucosal diseases and orofacial pain screening and referral processes should be a joint task performed by both the general dental practitioners and the medical practitioners, whereas 28.1% of the general dental practitioners and 26.3% of the general medical practitioners agreed that oral mucosal diseases and orofacial pain screening and referral should be done primarily by the dentist. None of the general medical practitioners thought that patients with oral mucosal diseases and orofacial pain should visit an oral medicine specialist directly without seeing a general medical practitioner first.

Theme 2: Oral mucosal diseases and orofacial pain screening

Subtheme 2a: Awareness level. Of the study participants, 87.5% of the general dental practitioners and 52.6% of the general medical practitioners considered that oral mucosal diseases and orofacial pain screening are a treatment priority. With regard to opinions on the importance of oral mucosal diseases and orofacial pain screening, a statistically significant difference was found between the general dental practitioners and the medical practitioners ($\chi^2 = 8.2$; $P < .05$). In Auckland and Dunedin, nearly three-quarters of the general dental practitioners (71.9%) performed oral mucosal diseases and orofacial pain screening on a routine basis. However, none of the general medical practitioners routinely checked for the oral mucosal diseases and orofacial pain (Figure 1).

Subtheme 2b: Confidence level. Of the study participants, 78.1% of the general dental practitioners and 89.5% of the general medical practitioners in Auckland and Dunedin reported that they had limited exposure to oral mucosal diseases and orofacial pain; 75% of the general dental practitioners and 68.4% of the general medical practitioners reported having fair confidence in assessing and diagnosing oral mucosal diseases and orofacial pain. There was a statistically significant difference between the general dental practitioners (96.9%) and the general medical practitioners (73.7%) in holding off referrals and self-monitoring their patients, if appropriate ($\chi^2 = 7.5$; $P < .05$). With complex cases, 56.3% of the general dental practitioners

Table II. Demographic characteristics of the oral medicine specialists included in the study

	Qualifications	*Training location*	*Practicing sector*	*Years of experience*
1.	Bachelor of Dental Surgery (BDS) Doctor of Clinical Dentistry (DClinDent) in Oral Medicine Bachelor of Medicine and Bachelor of Surgery (MBChB)	University of Otago	Public and private	2 years
2.	Bachelor of Dental Surgery (BDS) Royal College of Surgeons of Edinburgh Fellowship (RCSEd)	University of Otago Royal College of Surgeons of Edinburgh	Public and private	9 years
3.	Bachelor of Dental Surgery (BDS) Masters in Dental Science (MDSc) in Oral Pathology and Oral Medicine	University of Otago University of Melbourne	Public and private	18 years

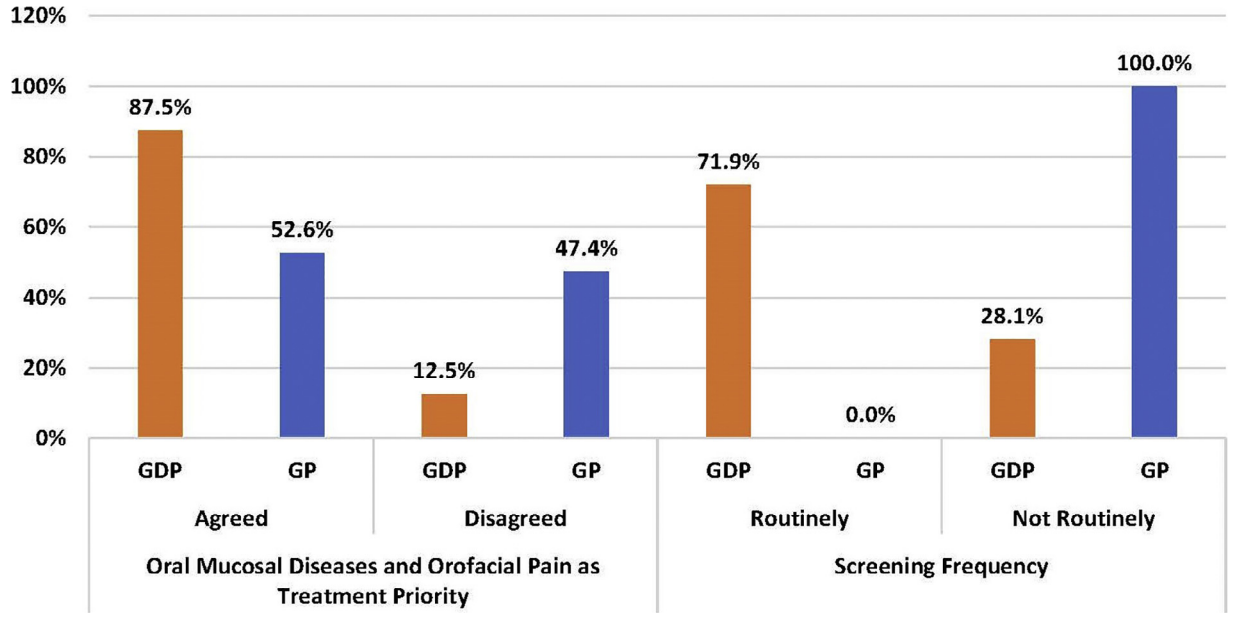

Fig. 1. Awareness level of oral mucosal diseases and orofacial pain screening among general dental practitioners (GDPs) and general medical practitioners (GPs).

reported seeking a second opinion from oral medicine specialists, whereas 31.6% of the general medical practitioners reported discussing their cases with other general medical practitioners. The difference between the general dental practitioners and the medical practitioners with regard to seeking a second opinion was statistically significant ($\chi^2 = 23.7$; $P < .01$). Before referring patients to other practitioners, 71.9% of the general dental practitioners and 79% of the general medical practitioners agreed on the importance of providing differential diagnoses of oral mucosal diseases and orofacial pain (Figure 2).

Subtheme 2c: Opinions of oral medicine specialists on screening for oral mucosal diseases and orofacial pain. Oral medicine specialists felt that the current screening for oral mucosal diseases and orofacial pain conditions by general dental practitioners and medical practitioners were not comprehensive enough.

#3: "Dentists tend to focus more on the dentition and periodontium whereas the physicians probably do have a look into the mouth but it will be a big look. There are no specific guidelines for oral screening in New Zealand but the practitioners can look for some guidance from the Health Pathways, an online manual, which may have something relevant to read up to. There are guidelines for practitioners and patients on the website named Oralmed.net. *In most countries, the oral medicine specialty is still in its infancy stage so there are more things that will come."*

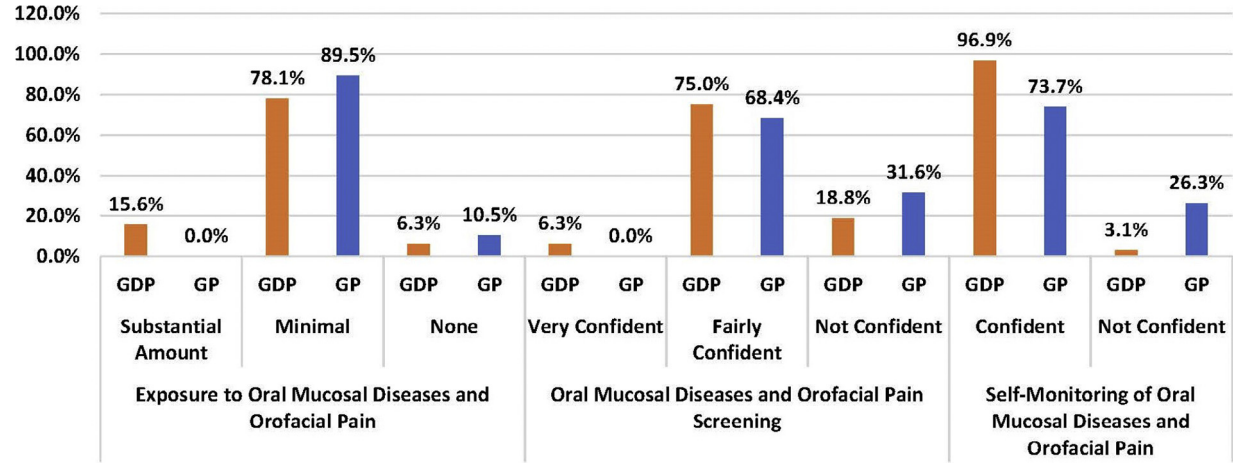

Fig. 2. Confidence in oral mucosal diseases and orofacial pain screening among general dental practitioners (GDPs) and general medical practitioners (GPs).

#1: "There is no guideline in New Zealand. There are guidelines in Australia and especially in the United Kingdom. Basically, you just follow the normal history and examination. They are useful."

All oral medicine specialists stressed the importance of early orofacial screening for the benefit of patients.

#1: "If they can correctly identify the oral lesions, especially those of oral cancer, it can benefit the patients as they can get the treatment earlier, proceed to biopsy earlier to confirm oral cancer or some other severe oral diseases as some patients don't always get referred to us (oral medicine specialists) to do the diagnosis."

Theme 3: Oral medicine referral practices

The general dental practitioners and the medical practitioners in Auckland and Dunedin differed with regard to investigations done before referral. The most common investigation that they performed was a combination of visual examination, biopsy, radiography, and blood tests, depending on the differential diagnosis.

Subtheme 3a: Guidelines for referral. Of the study participants, 68.8% of the general dental practitioners and 63.2% of the general medical practitioners reported that they did not have access to referral guidelines, but they believed it would be beneficial to have them; 21.9% of the general dental practitioners and 10.5% of the general medical practitioners preferred to contact an oral medicine specialist for advice for guidance before referral.

Subtheme 3b: Referral frequency and referee. Half of the general dental practitioners (50%) referred patients with oral mucosal diseases and orofacial pain to oral medicine specialists every time they encountered such cases, whereas 43.8% of the general dental practitioners would make a referral on the basis of clinical factors, such as asymmetry, border irregularity, color variation, diameter and evolution of lesions, the differential diagnosis, and the patient's risk factors (smoking and drinking habits). Of the general medical practitioners, 31.6% reported that they referred patients with oral mucosal diseases and orofacial pain to oral medicine specialists whenever they encountered the cases.

Subtheme 3c: Details on referral forms/letters. All of the general dental practitioners and medical practitioners included patient history (including medical history, relevant dental history, social history, and family history), examination (extraoral and intraoral) findings and results on the referral form or letter, but in different combinations; 3.1% of the general dental practitioners would perform all relevant special tests before referral, but 10.5% of the general medical practitioners did not do any special tests before referral.

Subtheme 3d: Opinions of oral medicine specialists on the importance of early referral. According to the oral medicine specialists included in the study, the importance of early referral was undeniable.

#3: "If you are unsure of something then it should be referred earlier than later. Sometimes what I find is that the dentists or physicians do part of the investigations, but they are not often complete enough, so the oral medicine specialist often has to repeat some of those things or complete the test. So probably if you are not going to manage the patient long term or not feeling confident about what the diagnosis might be, it is better to just refer the patient because otherwise, all that you are doing is wasting the patient's time . . . It is probably better to refer oral medicine type patients to oral medicine specialists as most of the cases are chronic . . . It is not ok for the dentists and physicians to treat the patients before definitive diagnosis . . . If you are in an area where there is no

oral medicine specialist, oral maxillofacial surgeon is the next handyman."

In addition, they identified problems with the current referral, such as being inaccurate and unreliable.

#1: "The practitioners only describe the lesion in very simple terms . . . very hard to know the urgency of the lesion . . . For the dentists, the medical history is lacking. For the physicians, they are normally trained on the whole medical conditions and medications but they are lacking the description of the lesion."

#3: "I think the dentists' points of view regarding the patients' facial pain and mucosal pain are a little more accurate. . . The most common thing I find is the physicians tend to treat most of the patients' (mucosal lesions) as candida infections and facial pain as trigeminal neuralgia. . .The referrals from the ENT (ear, nose, and throat) surgeons and oral maxillofacial surgeons are reasonably accurate."

Theme 4: Supplementary resources for referral

Subtheme 4a: Continuing professional development courses. The proportion of the general dental practitioners (59.4%) who had undertaken further studies or continuing professional development courses in the area of oral medicine was greater than that of the general medical practitioners (5.3%), and it was found to be statistically significant ($\chi^2 = 15.3$; $P < .01$). The majority of the general medical practitioners (94.7%) did not attend any oral medicine continuing professional development courses, mainly because of limited availability of the relevant courses. However, 68.4% of them reported being interested in it; 65.6% of the general dental practitioners and 78.9% of the general medical practitioners believed that continuing professional development courses in oral medicine would be beneficial but should be made optional instead of being mandatory. Most of the practitioners (45.1%) had no preference in terms of the formats of the continuing professional development courses; 53.1% of the general dental practitioners reported that they would like to learn about differential diagnoses and the management of common oral mucosal diseases and temporomandibular joint diseases, and 52.6% of the general medical practitioners showed interest in topics related to the management of common oral mucosal diseases and malignancy.

Subtheme 4b: Standardized referral guidelines. The majority of the general dental practitioners (93.8%) and general medical practitioners (89.5%) agreed that it was important to have standardized national referral guidelines. Similarly, 84.4% of the general dental practitioners and 68.4% of the general medical practitioners preferred a standardized referral form or template. The general dental practitioners showed more interest compared to the general medical practitioners in including in the referral guidelines a wide range of details, such as a step-by-step description of the screening process for oral mucosal diseases and orofacial pain and a list of indications of urgency for referral, as well as a detailed history of the patient's complaint, details of investigations and treatments initiated, provisional diagnoses, and radiographs and clear pictures in the referral letters. A statistically significant difference was found between the general dental practitioners and the medical practitioners ($\chi^2 = 18.3$; $P < .05$).

Subtheme 4c: Opinions of oral medicine specialists on the development of referral guidelines and continuing professional development courses. All oral medicine specialists recommended having referral guidelines established for the use of both the general medical practitioners and the dental practitioners.

#3: "The issue with oral medicine type of patients is that there aren't a lot around. Therefore, the dentists or physicians don't get much exposure so (it is) difficult to become proficient at it... Then a guideline is good in that regard. Without the guideline, I find that the physicians will probably follow the (usual) medical process in managing those patients. I think the dentists seem to be perhaps a little bit better because they were taught on this in the university."

To improve the referral practice, practitioners should provide oral medicine specialists with more information, such as the patient's demographic details; the basic history and examination findings, including information about the cervical lymph nodes; comprehensive medical history; full details of the lesion, as well as treatments already undertaken; and all investigation results, including photographs.

#3: "It is ok to put a differential diagnosis in but the definitive diagnosis would be made by the oral medicine specialist anyway.

"The referral practice needs to be improved at the university level as it is probably going to be a generational change rather than changing the current practitioners out there. However, you can do some further education programs as every practitioner needs continuing professional development. The issue with NZ is that there are not many oral medicine specialists so it cannot cover the whole population. Writing and publishing relevant articles may help."

There were benefits to undertaking continuing professional development courses to improve knowledge of oral mucosal diseases and orofacial pain.

#3: "Continuing professional development courses are very important, that is how the practitioners get the message. It is a reassurance if they attend courses."

#1: "If we (oral medicine specialists) can provide some courses to the dentists and the physicians, they can know more about those lesions as oral medicine is such an important subject to learn. . .most diseases can

present in the oral cavity first before they present at other places. If you can recognise those diseases earlier, then you can manage them earlier."

#2 "The relation between oral health to general health is fundamental."

DISCUSSION

This study utilized quantitative and qualitative methods to analyze oral medicine referrals from general dental practitioners, medical practitioners, and oral medicine specialists in New Zealand. First, the quantitative study explored the roles of a general medical practitioner and a general dental practitioner in the field of oral medicine and their perspectives on this specialty. The present study showed that general dental practitioners and medical practitioners agreed that both parties played very important parts in oral medicine referrals. Although there was an agreement of opinion, differences were seen between the general dental practitioners and medical practitioners in their opinion of screening and referral practices for oral mucosal diseases and orofacial pain. For instance, the general dental practitioners reported that they would consult an oral medicine specialist before they made a referral, whereas the general medical practitioners stated that they would seek a second opinion from other general medical practitioners before making a referral. Statistically significant differences were found in the views of general dental practitioners and medical practitioners with regard to orofacial screening as a treatment priority and their confidence level in assessing and diagnosing oral mucosal diseases and orofacial pain. The development of standardized guidelines was supported by the majority of both general dental practitioners and medical practitioners. As of 2019, 5 registered oral medicine specialists were practicing in New Zealand, and 3 were interviewed. All the participants shared the same opinion on the inadequacy of the current oral mucosal diseases and orofacial pain screening and referral practices among the general dental practitioners and medical practitioners; they also felt that screening for oral mucosal diseases and orofacial pain by general dental practitioners and medical practitioners is not comprehensive and that their referral documents often lack important information.

This study had a few limitations. First, because the participants were recruited from Auckland and Dunedin, it may not be possible to generalize the results. Second, selection bias might be present because there was overrepresentation of the younger age group for the general dental practitioners, and of the middle age group for the general medical practitioners. However, this study revealed not only the challenges faced by both general dental practitioners and medical practitioners in managing patients with oral mucosal diseases and orofacial pain but also the potential development of solutions. The semi-structured approach of this qualitative study helped capture a wide range of the perspectives of oral medicine specialists on oral medicine referrals and guidelines in depth. Moreover, the findings of this study may add to the limited and insufficient information on oral medicine referral and guidelines.

This study found that both general dental practitioners and medical practitioners were confident in performing orofacial examinations and providing key information for referrals. It also showed that 71.9% of the general dental practitioners routinely screened the head and neck region, but all of the general medical practitioners did not. Because of the differences in the course structures for general dental practitioners and medical practitioners, there are variances in the pattern of seeking second opinions. For instance, general dental practitioners tend to seek a second opinion from oral medicine specialists, whereas general medical practitioners would discuss their cases only with other general medical practitioners. In addition, many general medical practitioners are not aware of the oral medicine specialty and refer their patients to relative specialists.[17] A research study done in India found that 69% of the general medical practitioners were not aware of the oral medicine specialty. General medical practitioners often refer patients with oral mucosal diseases to both general dental practitioners and medical practitioners, those with temporomandibular joint problems and orofacial pain to ENT (ear, nose, and throat) specialists, and those with salivary gland problems to general surgeons.[18] The age group, higher degree in medicine, country of graduation, and the specialty type could have an impact on the level of awareness of the specialty of oral medicine among general medical practitioners.[19] Furthermore, the referral pattern may be influenced by the practice location, which might be dental schools, hospitals, academic medical centers, cancer treatment centers, or private practices.[6]

As indicated by the interview results, all of the oral medicine specialists agreed that there were no official oral medicine referral guidelines in New Zealand. The most frequently used oral medicine referral guideline, as of 2019, is from the National Health Service of the United Kingdom. It states that core information upon finding abnormal oral mucosal diseases, such as potentially malignant and malignant oral lesions, both acute and chronic widespread oral mucosal ulceration, acute salivary gland pathology, facial numbness, acute oral mucosal infections, acute oral manifestations of systemic disease, and orofacial pain (e.g., trigeminal neuralgia), should all be noted by the primary health care practitioners during routine examination.[20] While referring the patient to an oral medicine specialist, indication of urgency, detailed history of the patient's complaint, details of investigations and treatments initiated, provisional diagnosis, radiographs, and clear pictures

should all be included.[20,21] These guidelines aim to help practitioners meet the practice standard in collaboration with professional judgment at all times.[22]

Findings from this study suggest that typically, general dental practitioners and medical practitioners do not have sufficient oral medicine training and exposure to oral mucosal diseases and orofacial pain, although 15.6% of the general dental practitioners in the study claimed to have a substantial amount of exposure, whereas none was reported by the general medical practitioners. Therefore, oral medicine should be incorporated into the curriculum for both dental and medical students, and further continuing professional development training should be undertaken by all general dental practitioners and medical practitioners in New Zealand. Oral health knowledge among future dentists is generally sufficient, but basic knowledge of oral health among future physicians is deficient.[23,24] Innovative curriculums that involve oral health sessions and adequate dental clinical exposures for medical students could be implemented. Seminars could be organized and information packs could be distributed to students to provide more information related to oral medicine. Besides, interprofessional observation allowing medical interns to work alongside dental interns in the same community could promote their knowledge level and awareness of oral changes and risk factors for oral cancer.[25] In this study, all the general medical practitioners and the majority of the general dental practitioners (93.8%) were interested in undertaking continuing professional development courses. The limiting factors were the high cost and the restricted availability of oral medicine−related continuing professional development courses. This study may facilitate making continuing professional development courses more available by using online formats aimed at practitioners with access barriers so that they could develop a better understanding of oral medicine and become more confident in treating such cases.

This was the first study in New Zealand that investigated the methods and formats of oral medicine referrals. The study findings suggested that awareness of oral mucosal diseases and orofacial pain screening should be raised among general dental practitioners and medical practitioners. Standardized national oral medicine referral guidelines should be developed to enhance the efficiency and effectiveness of patient management and the referral process for oral mucosal diseases and orofacial pain.

CONCLUSIONS

Most of the practitioners included in the study appreciated the importance of screening and referral for oral mucosal diseases and orofacial pain and understood their responsibility in performing these measures. There were some variations in the screening and referral practices between the general dental practitioners and the medical practitioners as a result of the differences in their undergraduate training, personal knowledge of oral medicine, and work practice procedures. From oral medicine specialists' point of view, the current referral pattern could be improved by providing more complete clinical information. All 3 parties agreed that standardized national referral guidelines and oral medicine continuing professional development courses would both be beneficial for general dental practitioners and medical practitioners in effectively managing patients with oral mucosal diseases and orofacial pain.

ACKNOWLEDGMENT

We would like to thank the participants (oral medicine specialists, general dental practitioners, and medical practitioners) who contributed their time and shared their valuable knowledge.

REFERENCES

1. New Zealand Dental Council. Scopes of practice. New Zealand Dental Council [Internet]. 2019. Available at: https://www.dcnz.org.nz/i-practise-in-new-zealand/dentists-and-dental-specialists/scopes-of-practice. Accessed September 25, 2019.
2. Spielman A. The future of oral medicine. *Oral Dis*. 2018;24:285-288.
3. Yap T, McCullough M. Oral medicine and the ageing population. *Aust Dent J*. 2015;60:44-53.
4. Ministry of Health NZ. Our Oral Health: Key findings of the 2009 New Zealand Oral Health Survey. Ministry of Health NZ [Internet]. 2019. Available at: https://www.health.govt.nz/publication/our-oral-health-key-findings-2009-new-zealand-oral-health-survey. Accessed September 25, 2019.
5. Ni RR, O'Sullivan K, McCreary C. Retrospective evaluation of the referral pattern to an oral medicine unit in Ireland. *Community Dent Health*. 2011;28:107-110.
6. Villa A, Stock S, Aboalela A, et al. Oral Medicine referrals at a hospital-based practice in the United States. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2015;119:423-429.
7. Villanueva-Vilchis M, Lopez-Rios P, Garcia I, Gaitan-Cepeda L. Impact of oral mucosa lesions on the quality of life related to oral health. An etiopathogenic study. *Med Oral Pathol Oral Cir Bucal*. 2016;21:e178-e184.
8. Zohoori F, Shah K, Mason J, Shucksmith J. Identifying factors to improve oral cancer screening uptake: a qualitative study. *PLoS One*. 2012;7:E47410.
9. Morgan R, Tsang J, Harrington N, Fook L. Survey of hospital doctors' attitudes and knowledge of oral conditions in older patients. *Postgrad Med J*. 2001;77:392-394.
10. Jovanović A, Schulten EA, van der Waal I. Referral pattern of patients with oral mucosal lesions in The Netherlands. *Community Dent Oral Epidemiol*. 1990;97:523-525.
11. The Oral Cancer Foundation. The role of dental and medical professionals. The Oral Cancer Foundation [Internet]. 2019. Available at: https://oralcancerfoundation.org/dental/role-dental-medical-professionals. Accessed September 25, 2019.
12. New Zealand Dental Council. Safe oral health care for New Zealand- Annual report 1 April 2018- 31 March 2019. 12. New Zealand Dental Council [Internet]. 2019. Available at: https://www.

dcnz.org.nz/assets/Uploads/Publications/Annual-reports/2019-Annual-Report-DIGITAL.pdf. Accessed September 25, 2019.
13. Medical Council of New Zealand. Annual report 2018. Medical Council of New Zealand [Internet]. 2018. Available at: https://www.mcnz.org.nz/assets/Publications/Annual-Reports/7080513fe1/MCNZ-Annual-Report-2018.pdf. Accessed January 23, 2020.
14. New Zealand Dental Council. Find a registered oral health practitioner. Dental Council. New Zealand Dental Council. [Internet]. 2020. Available from: https://www.dcnz.org.nz/practitioners/PractitionerSearchForm?Practice=Oral+medicine+specialist&Surname=&Name=&Address=&PersonID=&action_doPractitionerSearch=Search. Accessed January 23, 2020.
15. Lim N, Bennani F, Mei L, Thomson W, Farella M, Antoun J. Orthodontic screening and referral practices of dental therapists in New Zealand. *Aust Orthod J*. 2017;33:158-169.
16. Williams C. Research methods. *J Business Econ Res*. 2007;5:65-70.
17. Subramanian VP. Awareness of oral medicine specialty among medical practitioners in and around the locality of Chennai: a survey. *Res J Pharm Technol*. 2016;9(8):1073.
18. Gundlapalle P, Bokkasam V, Raviraj J, Kolugundla V, Vardhan H, Thombarapu L. Awareness of oral medicine specialty among medical practitioners in and around Tirupati: a survey. *J Indian Acad Oral Med Radiol*. 2015;27:59.
19. Alrashdan M, Darwazeh A, Hassona Y, Bader D, Khader Y. Awareness of oral medicine among medical practitioners, evidence of the unbridged interdisciplinary gap. *J Eval Clin Pract*. 2018;25:142-147.
20. National Health Service England. Oral Medicine referral guidelines for GDPs. Oral Medicine referral guidelines for GDPs. National Health Service England [Internet]. 2019. Available at: https://www.england.nhs.uk/south/wp-content/uploads/sites/6/2019/02/mcn-oral-surgery-referral-guidelines-for-gdps-jan-2019-v1.pdf. Accessed September 25, 2019.
21. The National Institute for Health and Care. Excellence. Guidance on Referral of Suspected Oral Cancer. The National Institute for Health and Care Excellence [Internet]. 2019. Available at: https://clinox.info/clinical-support/local-pathways-and-guidelines/Clinical%20Guidelines/Guidance%20on%20Referral%20of%20Suspected%20Oral%20Cancer.pdf. Accessed September 25, 2019.
22. Gibson J. Oral cancer—CPD and the GDC. *Br Dent J*. 2018;225:884-888.
23. Koşan Z. Is oral-dental health training in faculties of medicine and dentistry sufficient? A comparison of students' knowledge levels. *Turk J Public Health*. 2017;15:201-211.
24. Awan K, Khang T, Yee T, Zain R. Assessing oral cancer knowledge and awareness among Malaysian dental and medical students. *J Cancer Res Ther*. 2014;10:903.
25. Shrestha A, Marla V, Shrestha S, Agrawal D. Awareness of undergraduate dental and medical students towards oral cancer. *J Cancer Educ*. 2016;32:778-783.

Reprint requests:
Guangzhao Guan
Department of Oral Diagnostic and Surgical Sciences
Faculty of Dentistry
University of Otago
310 Great King Street
Dunedin
9016
New Zealand.
Simon.guan@otago.ac.nz

APPENDIX

Appendix 1. Survey questionnaire for general dental practitioner (GDP)

Questions	*Answers*
1. I have read and understood the information and aims of the research study, and agree to take part in it. I understand that any information I provide may be used in academic or professional journals/ conferences. However, no personal identifiers will be used in the preparation of this material.	Yes, I agree to take part No, I would prefer not to participate
2. Are you:	Male Female
3. What is your age?	(Open response)
4. Where did you complete your primary dental degree qualification?	New Zealand Australia Others (please specify)
5. What qualifications do you hold?	Bachelor of Dental Surgery (Otago) Others (please specify qualification and institution)
6. In which year did you obtain your primary dental surgery qualification?	(Please specify qualification year)
7. Have you obtained any further qualifications following your primary dental surgery qualifications?	No Yes (please specify qualification, institution and year obtained)
8. How long have you been practising as a general dental practitioner?	Less than 2 years 2 to 5 years 5 to 10 years Over 10 years
9. Which region are you currently practising in?	North Island (Please specify region) South Island (Please specify region)
10. Where do you currently practice?	Major city (Eg. Dunedin, Christchurch, Auckland) Provincial town (Eg. Russell, Kaikoura) Others (Please specify)
11. Which sector are you working in?	Private Public Both (Please give an approximate percentage of time you spend working in the private sector)
12. Oral mucosal diseases and orofacial pain screening is a treatment priority.	Strongly agree Agree Neutral Disagree Strongly Disagree
13. How many patients have you encountered that have oral mucosal diseases and orofacial pain (per year)?	(Open response)
14. Which statement best describes the patients you screen for oral mucosal diseases and orofacial pain?	I routinely screen all of my patients I routinely screen all of my patients that are between a certain age I take notice only if there is an obvious lesion I do not screen any patients
15. How confident are you in assessing and diagnosing oral mucosal diseases and orofacial pain?	Very confident Fairly confident, but could benefit from further education/second opinion Not confident
16. How much experience have you had to oral pathology diagnosis in your career?	A substantial amount (ie. regularly see patients requiring oral medicine screening) Minimal (ie. occasionally see patients requiring oral medicine screening) None
17. Do you think that it is important to be able to identify differential diagnoses of oral mucosal diseases and orofacial pain before referral?	Very important Important Neutral Not important Irrelevant
18. Which of the following do you carry out when deciding whether to refer a patient?	Visual monitoring of the lesion for some times Biopsy, Smear and stain/ swab and culture Radiograph Blood test Any combination of the above (Please specify)

(*continued*)

Appendix 1. Continued

Questions	*Answers*
	Others (Please specify)
	None of the above
19. How confident are you at holding off referrals and monitoring a patient (if appropriate)?	Very confident
	Fairly confident, but could benefit from further education
	Not confident
20. Do you have somebody to discuss complex cases with?	Yes -another general dentist
	Yes -a general doctor
	Yes -an oral medicine specialist
	No
21. How often do you refer patient with oral mucosal diseases and orofacial pain to oral medicine department?	Everytime
	None at all
	Others (please specify when do you refer when do you not)
22. What do you think the oral mucosal diseases and orofacial pain screening/referral process should be handled?	A joint task between GDP and GP
	Primarily be done by GP
	Primarily be done by GDP
	Patients should go directly to an oral medicine specialist
	Others (Please specify)
23. Do you follow a fixed set of guidelines or protocols for referring patients for oral medicine treatment?	I have access to, and use, a guideline
	I have access to, but do not use, a guideline
	I do not have access to a guideline but believe it would be beneficial
	I do not wish to use a guideline
	I prefer to rely on an oral medicine specialist input/advice
24. Which document do you use for referring patients for oral medicine treatment?	A specific referral form
	A template referral letter
	A specific referral formal and a template referral letter
	No specific document
25. What do you include in the referral form?	Reason for visit
	Medical history
	Dental history
	Social history
	Family history
	Extraoral findings
	Intraoral findings
	Investigation and results
	All of the above
	Others (Please specify)
26. To whom would you refer patients requiring an oral medicine consultation?	A specific oral medicine specialist
	A list of oral medicine specialists
	A general doctor
27. Have you undertaken any further studies/CPD courses in the area of oral medicine?	Yes – a comprehensive course in oral medicine for GDP
	Yes – a CPD course/seminar
	No – But I would like to
	No – I would prefer not to
27 (a). If answer "No", what reasons for you not attending any recent CPD events in oral medicine? (select all that apply)	Cost of CPD events
	Limited availability of these courses
	Topics not interesting/ relevant
	Other (Please specify)
27 (b). If answer "Yes", who was the presenter/ lecturer?	An oral medicine specialist
	A general dentist
	Both a and b
	A general doctor
	You do not know
28. Do you believe CPD courses in oral medicine would be beneficial?	Yes -they should be made mandatory
	Yes -but they should be optional
	No
29. Which format would you prefer for CPD events?	Online
	Face-to-face
	No preference
30. Which oral medicine topics would you like to see covered in future CPD courses?	(Open response)

(*continued*)

Appendix 1. Continued

Questions	*Answers*
31. Do you think a standardised national guideline for oral medicine referrals for general dentists would be useful?	Yes No -I am happy with the one I use No -I think it is unnecessary
32. What aspects do you think should be included in the guidelines?	What to look for at certain ages Clinical situation requiring early referral A step by step screening guide and normal parameters A standardised assessment form A standardised referral form Other (please specify)
33. Do you think a standardised national oral medicine referral form for general dentists would be useful?	Yes No – I am happy with the one I use No – I think it is unnecessary
34. Please add any further comments you may have:	(Open response)
35. If given the choice as a GDP whom is interested in getting a specialization for oral medicine (DClinDent), where would you prefer to obtain your specialization degree?	New Zealand (includes 3 years of MBBS & 3 years of DClinDent) Australia (3 years of DClinDent) (Please elaborate)

Appendix 2. Survey questionnaire for general practitioner (GP)

Questions	*Answers*
1. I have read and understood the information and aims of the research study, and agree to take part in it. I understand that any information I provide may be used in academic or professional journals/ conferences. However, no personal identifiers will be used in the preparation of this material.	Yes, I agree to take part No, I would prefer not to participate
2. Are you:	Male Female
3. What is your age?	(Open response)
4. Where did you complete your primary medical degree qualification?	New Zealand Australia Other (please specify)
5. In which year did you obtain your primary medical degree?	(Please specify qualification year)
6. Have you obtained any further qualifications following your primary medical degree?	No Yes (please specify qualification, institution and year obtained)
7. How long have you been practising as a general practitioner?	Less than 2 years 2 to 5 years 5 to 10 years Over 10 years
8. Which sector are you working in?	Private Public Both (Please give an approximate percentage of time you spend working in the private sector)
9. Oral mucosal diseases and orofacial pain screening is a treatment priority.	Strongly agree Agree Neutral Disagree Strongly Disagree
10. Do you think it is important to pay attention to the oral mucosal diseases and orofacial pain?	Yes No
11. How many patients have you encountered that have oral mucosal diseases and orofacial pain?	(open response)
12. Which statement best describes the patients you screen for oral mucosal diseases and orofacial pain?	I routinely screen all of my patients I routinely screen all of my patients that are between a certain age I take notice only if there is an obvious lesion I do not screen any patients
13. How confident are you in assessing and diagnosing oral mucosal diseases and orofacial pain?	

(*continued*)

Appendix 2. Continued

Questions	*Answers*
	Very confident
	Fairly confident, but could benefit from further education/second opinion
	Not confident
14. How much exposure/experience have you had to oral pathology diagnosis in your career?	A substantial amount (i.e. regularly see patients requiring oral medicine screening)
	Minimal (i.e. occasionally see patients requiring oral medicine screening)
	None
15. Do you think that it is important to be able to identify differential diagnoses of oral mucosal diseases and orofacial pain before referral?	Very important
	Important
	Neutral
	Not important
	Irrelevant
16. Which of the following do you carry out when deciding whether to refer a patient?	Visual monitoring of the lesion for some times
	Biopsy, smear and stain/ swab and culture
	Radiograph
	Blood test
	Any combination of the above (Please specify.)
	Others (Please specify.)
	None of the above
17. How confident are you at holding off referrals and monitoring a patient (if appropriate)?	Very confident
	Fairly confident, but could benefit from further education
	Not confident
18. Do you have somebody to discuss complex cases with?	Yes -another general doctor
	Yes -a general dentist
	Yes – a medical specialist
	Yes -a oral medicine specialist
	No
19. How often do you refer patient with oral mucosal diseases and orofacial pain to oral medicine department?	Everytime
	None at all
	Other (please specify when do you refer when do you not)
20. What do you think the oral mucosal diseases and orofacial pain screening/referral process should be handled?	A joint task between GP and general dentist
	Primarily be done by GP
	Primarily be done by general dentist
	Patients should go directly to an oral medicine specialist
	Others (Please specify)
21. Do you follow a fixed set of guidelines or protocols for referring patients for oral medicine treatment?	I have access to, and use, a guideline
	I have access to, but do not use, a guideline
	I do not have access to a guideline but believe it would be beneficial
	I do not wish to use a guideline
	I prefer to rely on an oral medicine specialist input/advice
22. What do you include in the referral form?	Reason for visit
	Medical history
	Dental history
	Social history
	Family history
	Extraoral findings
	Intraoral findings
	Investigation and results
	All of the above
	Others (Please specify)
23. To whom would you refer patients requiring an oral medicine consultation?	A specific oral medicine specialist
	A list of oral medicine specialists
	A maxillofacial surgeon
	A general dentist
24. Have you undertaken any further studies/CPD courses in the area of oral medicine?	Yes – a comprehensive course in oral medicine for GP
	Yes – a CPD course/seminar
	No – But I would like to
	No – I would prefer not to
	Cost of CPD events
	Limited availability of these courses

(*continued*)

Appendix 2. Continued

Questions	*Answers*
24 (a). If answer "No", what reasons for you not attending any recent CPD events in oral medicine? (select all that apply)	Topics not interesting/ relevant Other (Please specify)
24 (b). If answer "Yes", who was the presenter/ lecturer?	An oral medicine specialist A general dentist Both a and b A general doctor A medical specialist An oral pathologist/ general pathologist You do not know
25. Do you believe CPD courses in oral medicine would be beneficial?	Yes -they should be made mandatory Yes -but they should be optional No
26. Which format would you prefer for CPD events?	Online Face-to-face No preference
27. Which oral medicine topics would you like to see covered in future CPD courses?	(Open response)
28. Do you think a standardised national guideline for oral medicine referrals for GP would be useful?	Yes No -I am happy with the one I use No -I think it is unnecessary
29. What aspects do you think should be included in the referral form for oral medicine?	What to look for at certain ages Clinical situation requiring early referral A step by step screening guide and normal parameters A standardised assessment form A standardised referral form Other (please specify)
30. Do you think a standardised national oral medicine referral form for GP would be useful?	Yes No – I am happy with the one I use No – I think it is unnecessary
31. Please add any further comments/feedback you may have:	(open response)

Appendix 3. Semi-structured interview questions for oral medicine specialists.

Interview questions for oral medicine specialists

1 What qualifications are you holding?
2 When did you graduate with your qualifications?
3 (a) Where did you train? (b) Which sector (public or private or both)?
4 How long have you been practising as an oral medicine specialist?
5 (a) Are there any current guidelines in place for screening oral pathology for the general dental and medical practitioners in New Zealand? (b) Are they useful? How reliable are they? (c) How about any guidelines from other countries that you are aware of?
6 How accurate/reliable is the current referral practice from the general dental and medical practitioners?
7 (a) Have you ever experienced confusion in interpreting the referral made by the general dental and medical practitioners? Could you please elaborate? (b) Any miscommunications or misunderstandings? (c) What information is lacking? (d) Do you think the oral mucosal diseases and orofacial pain screening done by the general dental and medical practitioners is comprehensive enough?
8 What you think can be done better at the current referral method?
9 Do you see any benefits in correctly identifying the oral lesion early by the general dental and medical practitioners?
10 Do you see any benefits of developing a standardised guideline for the general dental and medical practitioners in oral screening and referral?
11 What should be included in the referral letter to oral medicine unit?
12 Do you see any benefits of organising more events/ continuing professional development courses for the general dental and medical practitioners to improve their ability in the oral screening?
13 Are there any resources available that you recommend for the general dental and medical practitioners to read up to improve their oral mucosal diseases and orofacial pain diagnostic skills?
14 How important do you consider the oral mucosal diseases and orofacial pain in relation to other oral health and general health problems?