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Knowledge and Practice Regarding Oral Cancer: A Study Among Dentists in Jakarta, Indonesia

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ABSTRACT

Objective: To assess Indonesian dentists' knowledge of risk factors and diagnostic procedures related to oral cancer (OC) and to determine the factors that influenced their level of knowledge.
Methods: A modified version of a questionnaire that had been used to assess dentists' knowledge regarding OC in Canada was used. A total of 816 dentists were invited to participate in the study.
Results: The total response rate was 49.2%; however, the number of dentists from 5 regions in Jakarta were equally represented. Use of tobacco or alcohol and history of previous OC were the top 3 risk factors that were answered correctly by dentists, but there was a high proportion of dentists who considered some without any evidence as risk factors. Almost half of the dentists did not know the early signs of OC and that erythroplakia and leukoplakia were associated with increased risks of developing OC. Only about 27% of dentists had a high level of knowledge of risk factors and fewer dentists demonstrated a good knowledge of diagnostic procedures. Dentists' age group, year of graduation, and experience of continuing education significantly influenced the level of knowledge of diagnostic procedures (P < .05).
Conclusion: Dentists in Jakarta had a considerable level of knowledge of major risk factors of OC, although some gaps in their knowledge, especially in diagnostic procedures, were present. Increasing these competencies may aid in the prevention and early detection of OC.
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Introduction

Oral cancer (OC) is the most frequently encountered neoplasm among head and neck cancers and originates from the squamous epithelial lining of the oral cavity. More than 90% are squamous cell carcinomas.[1] The incidence of OC is increasing in many countries and is expected to rise by 62% by 2035.[2,3] The epidemiological data on OC in Asian countries have shown different trends, with some showing a rise and others with declining trends.[4] The pattern of OC incidence in South and Southeast Asian countries is interestingly distinct from those in other parts of the world. There are several with high incidence rates. Practices of betel-quid chewing and consumption of tobacco and alcohol are the major risk factors; hence, the disease is mainly preventable.[5]

The early detection of OC is important because diagnostic delays may affect the success of treatment and result in regional metastasis of the disease.[6-8] Several studies have examined the public awareness of OC.[9,10] Promoting public awareness and conducting preventive educational campaigns may increase the number of people who present to primary care with early disease and result in reducing the presentation of disease at an advanced stage.[8,11]

Furthermore, it is important to reduce delays in diagnosis.[8] Dentists play an important role in detecting OC at an early stage; the frequency of dental visits has been associated with increased OC awareness.[9,12] Our research has shown that only a small number of patients have gained information about OC from their dentists.[9] Dentists have a significant role in providing information about this disease. To do so, dentists need to have a good knowledge regarding the risk factors and clinical diagnostic procedures related to OC.[13,14]

To date, studies assessing the knowledge about OC among dentists in Indonesia are lacking. The aim of this study was to assess the knowledge of Indonesian dentists about the risk factors and clinical diagnostic procedures related to OC and to determine the factors that influence their level of knowledge.

Methods

This study used a modified version of a questionnaire that had been used to assess dentists' knowledge regarding OC in a study in Canada.[14] The questionnaire consisted of items on the sociodemographic characteristics of the participants and 30 questions on knowledge about the risk factors and diagnostic procedures for OC. The intended study sample included all licensed dentists practicing in government primary health care centres and in a random sample of dentists in private clinics across the Jakarta province.

A total of 465 government dentists and 351 private practice dentists were invited to participate in the study. The 351 private dentists were selected using the multistage random sampling technique; therefore, they represented the 5 regions in the Jakarta province. Informed consent to voluntarily participate in the study was obtained from all the participants. Those who did not return the questionnaire or submitted incomplete answers to the questions were excluded from the study.

The questionnaire consisted of items on sociodemographics along with 30 questions related to knowledge of OC risk factors (16) and the diagnostic procedures for OC (14). The dentists were asked to provide a *yes* or *no* response to each question. Each right answer was scored as 1. The score for each category was summed and divided into 3 groups as in Clovis's publication[14]: the scores for knowledge on risk factors were categorized as low (0-8), medium (9 or 10), and high (11-16). The scores for knowledge about diagnostic procedures were categorized as low (0-9), medium (10 or 11), and high (12-14).[14] This study was approved by the Ethics Committee of the Faculty of Dentistry, Universitas Indonesia.

Statistical analysis

The statistical analyses were conducted using SPSS software version 23.0. The relationships between the levels of knowledge about the risk factors and the diagnostic procedures with the sociodemographic factors were analysed using the χ^2 test. A significance level of .05 was used for all analyses.

Results

In total, 194 (41.7%) out of 465 dentists in government primary health centres and 208 (59.2%) out of 351 private practice dentists participated in the study. Although the total response rate of the study was only 49.2%, the number of dentists from 5 areas in Jakarta were equally represented. Table 1 lists the sociodemographic data of the dentists who participated in the study. The survey participation was dominated by female dentists in all age groups. Almost 45% of the dentists had graduated during the last 10 years and about 55% of them had never attended a continuing education session related to OC.

Table 2 shows the distribution of dentists who correctly answered the questions regarding the risk factors for OC. Use of tobacco or alcohol and history of previous OC were the top 3 risk factors that were answered correctly by the majority of the dentists; 4.5% to 9% of dentists did not consider these as risk factors for OC. About 40% of the dentists were of the opinion that obesity, spicy food, and hot beverages were risk factors of OC, and a vast majority of the dentists (70%-80%) thought that poorly fitting dentures, familial clustering, poor oral hygiene, and family history were documented risk factors for the disease (Table 2).

Table 3 presents the distribution of the dentists based on the correct responses to the questions related to the clinical diagnostic procedures used for OC. About 30% of them did not know that oral squamous cell carcinoma is the most common type of OC. In addition, nearly 10% of the dentists did not know of the importance of early detection of OC for improving 5-year survival. Several dentists did not know the early signs of OC and that erythroplakia and leukoplakia were associated with increased risks of developing the disease. Furthermore, 40% of dentists were unaware that the majority of

Table 1 – Characteristics of dentists who responded to the questionnaire.

Characteristics	Public		Private		Total	
	n	%	n	%	N	%
Sex						
Male	21	10.8	61	29.3	82	20.4
Female	173	89.2	147	70.7	320	79.6
Age (year)						
20-29	21	10.8	90	43.3	111	27.7
30-49	77	39.7	75	36.0	152	37.8
>50	96	49.5	43	20.7	139	34.5
Regions of Jakarta						
Central	31	16.0	27	12.9	58	14.5
Eastern	47	24.2	45	21.7	92	22.9
Northern	22	11.3	34	16.4	56	13.9
Thousand Islands	1	0.5	0	0	1	0.2
Southern	38	19.6	62	29.8	100	24.9
Western	55	28.4	40	19.2	95	23.6
Year of graduation						
Before 2000	67	34.6	40	19.2	107	26.6
2001-2010	54	27.8	64	30.8	118	25.3
After 2010	73	37.6	104	50.0	177	44.1
Continuing education on oral cancer						
Within 1 year	15	7.7	17	8.2	32	7.9
Within 2-5 year	38	19.6	41	19.7	79	19.7
Within >5 year	31	16.0	38	18.2	69	17.1
Never						
Never attended a CPD course on OC	76	39.2	90	43.2	166	41.2
New graduates, have yet to attend	24	12.4	18	8.6	42	10.4
No answer	10	5.2	4	1.9	14	3.4

Table 2 – Distribution of dentists who provided correct answers for the questions on the risk factors for oral cancer.

Risk or nonrisk factors	Public		Private		Total	
	n (194)	%	n (208)	%	N (402)	%
Risk factors						
Use of tobacco	177	91.2	207	99.5	384	95.5
Alcohol use	176	90.7	194	93.2	370	92.0
Prior OC	169	87.1	197	93.2	366	91.0
HPV	141	72.7	179	86.0	320	79.6
Low consumption of fruit and vegetables	135	69.6	147	70.7	282	70.1
Older age	107	55.2	115	55.2	222	55.2
Use of smokeless tobacco	59	30.5	159	76.4	218	54.2
Lip cancer related to sun exposure	53	27.3	87	41.8	140	34.8
Majority of OC diagnosed at 60 years or older	19	9.8	28	13.4	47	11.7
Nonrisk factors						
Obesity	133	68.6	125	60.0	258	64.1
Hot beverages and food	130	67.1	130	62.5	260	64.7
Spicy food	122	62.9	128	13.4	250	62.1
Poorly fitting dentures	41	21.1	67	32.2	108	26.9
Familial clustering	25	12.9	41	19.7	66	16.4
Poor oral hygiene	19	9.8	42	20.1	61	15.1
Family history of cancer	11	5.7	41	19.7	52	12.9

HPV, human papillomavirus; N, number; OC, oral cancer.

cases of OC are diagnosed at an advanced stage; about half of the dentists had no knowledge about the signs of OC metastasis to the regional lymph nodes; and 57% of the dentists thought that a thorough examination of the tongue is important to diagnose OC.

Table 4 describes the distribution of dentists based on the scores for knowledge about the risk factors for OC. About one-fourth of the dentists presented with high scores; among them, the private dentists had higher scores than those in the public sector, statistical significance notwithstanding.

Table 5 presents the distribution of the dentists based on the scores for knowledge about the risk factors for OC. Although a higher number of dentists who belonged to the older age group (>50 years), had graduated several years

ago (before 2000), and had not attended continuing education courses demonstrated less knowledge about the risk factors for OC, the difference was not statistically significant (Table 5).

None of the dentists in this study had a good knowledge on the clinical diagnostic procedures in OC. Significant differences were observed on analysis by age group, year of graduation, and by their experience of continuing education (P < .05; Table 5).

The dentists in this study were further classified into 2 categories based on their patterns of knowledge about the risk factors and clinical diagnostic procedures (Table 6); 37% of them demonstrated a consistent level of knowledge in both the categories. Of the 254 dentists who had inconsistent

Table 3 – Distribution of dentists who responded correctly to the questions related to the clinical diagnostic procedures used in oral cancer.

	Question	Correct response					
		Public		Private		All dentists	
		n (194)	%	n (208)	%	N (402)	%
1	Early detection improves 5-year survival rates	178	91.8	184	88.5	362	90.1
2	Lesions associated with smokeless tobacco usually resolve when use is discontinued	142	73.2	144	69.2	286	71.1
3	Tongue is one of the 2 most common sites for OC	139	71.9	174	83.7	313	77.9
4	Squamous cell most common form of OC	116	59.8	167	80.3	283	70.4
5	Thorough tongue examination	116	59.8	114	54.8	230	57.2
6	OC lesions are most often diagnosed at an advanced stage	106	54.6	136	65.4	242	60.1
7	OC examination cannot be discontinued after three negative examinations	102	52.6	125	60.1	227	56.5
8	When palpated, a hard, painless mobile or fixed lymph node is characteristic of cancer metastasis	99	51.0	112	53.8	211	52.5
9	Early OC lesions usually appear as small, painless red area	92	47.4	87	41.8	179	44.5
10	Erythroplakia and leukoplakia, any order, are the 2 most likely to be associated with OC	78	40.2	43	20.7	121	30.1
11	Floor of mouth is one of the 2 most common sites	71	36.6	71	34.2	142	35.3
12	Ventrolateral border of the tongue most likely to develop OC	54	27.8	76	36.5	130	32.3
13	The patient is asymptomatic during the early stages of OC	27	13.9	27	12.9	54	13.4
14	Erythroplakia and leukoplakia, in order, are the 2 most likely to be associated with OC	11	5.7	35	16.8	46	11.4

OC, oral cancer.

Table 4 – Distribution of dentists based on their scores for knowledge about the risk factors and clinical diagnostic procedures for oral cancer.

Score category	Public n (194)	%	Private n (208)	%	All (total) N (402)	%	P value
Knowledge on risk factors for oral cancer							
High	38	19.6	70	33.7	108	26.9	.002*
Medium	75	38.6	78	37.5	153	38.0	
Low	81	41.8	60	28.8	141	35.1	
Knowledge on clinical diagnostic procedures for oral cancer							
High	0	0	0	0	0	0	
Medium	22	11.3	4	1.9	26	6.5	.01*
Low	172	88.7	204	98.1	376	93.5	

Risk factors (total of 16 items: high, 11-16; medium, 9 or 10; low, 0-8); Clinical diagnostic procedures (total of 14 items: high, 12-14; medium, 10 or 11; low, 0-9).

* P < .05 χ^2.

scores in both categories, almost all had better knowledge about the risk factors than the diagnostic procedures.

Discussion

The diagnosis of OC at an early stage is an important factor that influences the prognosis of the disease, and dental practitioners have a better chance of detecting this disease at the early stage. It is important for dentists to have good knowledge, attitude, and practices about the early detection of OC. This study assessed the knowledge about the risk factors for OC and the clinical diagnostic procedures used for its detection among dentists practicing in both government primary health centres and private practices in Jakarta, Indonesia. Additionally, the determining factors that influenced their level of knowledge were evaluated.

The response rate in this study (49.2%) was lower than expected. It was slightly lower than published in a previous study (55.2%) in North America and much lower than reported in studies conducted in Kuwait (76.5% and 71%).[14-16] Different methods of data collection for (eg, web-based or postal) may result in different response rates. Low response rates contribute to less representativeness of the study.

It was reassuring to note that use of tobacco and alcohol and a history of previous OC were the top 3 risk factors that were answered correctly by most of the dentists who responded to the survey. In the context of smokeless tobacco products available in Indonesia with high nitrosamine levels it was disappointing to note that half of the dentists did not know that smokeless tobacco could pose a similar risk to smoking cigarettes for the development of OC. Smokeless tobacco is defined as a type of tobacco that is not smoked or burned; its use is more prevalent than smoking in some Asian communities. Use of smokeless tobacco, particularly when mixed with betel quid leads to serious oral health consequences.[17] In several part of Indonesia such as North Sumatra, East Java, West Nusa Tenggara, South Sulawesi, and Papua

Table 5 – Dentists' level of knowledge about the risk factors and clinical diagnostic procedures for oral cancer based on gender, age, year of graduation, and attendance of a continuing education course.

Sociodemographic factors	Knowledge of risk factors				Knowledge of clinical diagnostic procedure			
	All dentists							
	H	M	L	P value	H	M	L	P value
Sex								
Male	17	21	23	.65	0	4	78	.09
Female	43	57	47		0	22	298	
Age								
20-29	33	41	37		0	8	103	.02*
30-49	54	78	49	.42	0	11	170	
>50	21	34	55		0	7	103	
Year of graduation								
Before 2000	29	57	75	.21	0	12	145	.02*
2001-2010	29	40	29		0	3	99	
After 2010	40	56	47		0	11	132	
Continuing education								
Within 1 year	7	11	14	.73	0	2	30	.02*
Within 2-5 year	28	42	47		0	13	104	
Never	63	100	90		0	11	242	

Risk factors (total of 16 items: H [high], 11-16; M [medium], 9 or 10; L [low], 0-8). Clinical diagnostic procedures (total of 14 items: H [high], 12-14; M [medium], 10 or 11; L [low], 0-9).

* P < .05.

Table 6 – Distribution of dentists based on the pattern of knowledge about the risk factors and diagnostic procedures for oral cancer.

Knowledge of risk factors	Knowledge of diagnostic procedures			
	Low	Medium	High	All dentists
Low	138 (34.3)	13 (3.3)	0	151 (37.6)
Medium	143 (35.6)	10 (2.5)	0	153 (38.1)
High	95 (23.6)	3 (0.7)	0	98 (24.3)
All dentists	376 (93.5)	26 (6.5)	0	402 (100)

Risk factors (total of 16 items: high, 11-16; medium, 9 or 10; low, 0-8). Clinical diagnostic procedures (total of 14 items: high, 12-14; medium, 10 or 11; low, 0-9).

provinces, smokeless tobacco is included in the betel quid. A study has shown that the prevalence of chewers of betel quid was 12% and 46% for men and women, respectively, and almost all them added tobacco to betel quid.[18] It is therefore important to teach health consequences of chewing smokeless tobacco products in the dental undergraduate curriculum.[19]

In this study, 30% of dentists were not aware of the potential preventive role of fruits and vegetables. Many controversial factors without any evidence in the published literature were considered by a high proportion of dentists as causally related to OC. This may be because of the excessive information in the social media on controversial factors contributing to development of OC.[20] A previous study evaluated the usefulness of YouTube videos in promoting the early detection of OC and found that the content of the videos needed to be improved for the provision of reliable information.[20] Misinformation regarding the roles of poorly fitting dentures, spicy food, hot drinks, poor oral hygiene, and human papillomavirus (HPV) causing OC may have been obtained from such sources. Thus, reliable sources of information related to health issues are important.[20] There are many websites and other sources of information online with incorrect information that are easily accessible to the public.[21,22] Furthermore, it is important to determine whether dentists question their patients about these risk factors. In the present study, we did not include any questions on this subject. However, in a previous study in Jakarta, only 30% of participants who visited a dental practice were asked about their risk habits (tobacco and alcohol) and counselled on the detrimental effects of these 2 agents on oral health.[9] The role of a dentist in the dissemination of this health information is important because some of the major risk factors are related to lifestyle and are preventable.[23] Digital technology is considered a new way to deliver health messages associated with the harmful effects of tobacco and alcohol use and the other preventable risk factors for the public and health professionals.[24]

Assessment of knowledge on the clinical diagnostic criteria for OC in this study revealed significant areas needing improvement, which indicates some weaknesses in training. One-third of the dentists did not know that oral squamous cell carcinoma is the most common type of cancer in the oral cavity. Although the majority of dentists in this study agreed that early detection improved the 5-year survival of this disease, only a small percentage were aware of the early signs

and symptoms of OC and examination procedures that need to be performed to obtain this information. These results were similar to those reported in studies conducted in the several countries.[14,15,25,26] This may be related to the limited training received in the undergraduate curriculum and lack of clinical experience of the dentist.[27] Furthermore, dentists demonstrated limited knowledge about potentially malignant disorders such as erythroplakia and leukoplakia, which are more likely to develop to OC, and about the mode of metastasis of advanced disease to the regional (neck) lymph nodes. The ability to recognize OC lesions at the early stage will help in preventing professional delay. A definitive diagnosis of OC requires biopsy for histopathological assessment; therefore, in cases where it is not possible to perform a biopsy, it is important that dentists perform a timely referral.[27]

The dentists were categorized based on their level of knowledge regarding the risk factors and clinical diagnostic procedures for OC. The majority of dentists did not have a high level of knowledge about the risk factors and had almost no knowledge about the clinical diagnostic procedures. A higher number of dentists who had low knowledge about the risk factors of OC belonged to the older age group, had graduated before the year 2000 and, moreover, had not attended any continuing education courses. The study findings indicated that sound knowledge of the risk factors did not assure adequate knowledge about the clinical diagnostic procedures that can be undertaken to examine for the disease, thus indicating that knowledge about the risk factors may be unrelated to knowledge about the diagnostic procedures used. This finding also indicates the need to design an effective continuing education course that could combine this information for the dentists. It was noteworthy that almost all the dentists in this study when asked about their willingness agreed to participate in continuing education courses related to OC to enhance their clinical competence. Several studies illustrate that continuing professional development (CPD) may be used as models for the professional development of dentists.[28-30] The General Dental Council (UK) recommends that dentists should keep their skills up to date by doing CPD on OC (https://www.gdc-uk.org/education-cpd/cpd/recommended-cpd-topics).

Some limitations of the study need to be recognized. A response rate of 49.2% limits the interpretation of data nationally. There is lack of direct evidence on some of the questions included in the questionnaire (eg, history of previous cancer, family clustering, and role of HPV in OC). These questions were directly taken from the previous published study and could have been excluded in this study.[14] HPV, although is more closely associated with oropharyngeal cancer,[31] its role in causation of oral cancer is unclear and may have only a minor, if any, role in oral oncogenesis.[32]

Furthermore, we did not include questions in the questionnaire on some other known risk factors for oral cancer such as Fanconi anaemia, tertiary syphilis, bone marrow transplantation, and chronic graft versus host disease.[33] Although the majority of the dentists in Indonesia are practicing in Jakarta, the results of this study may not be generalized to all dentists in the country. These results might reflect a significant need for continuing education courses of on oral cancer for dentists. Further studies in different cities within

Indonesia will add more information and aid in the development of a standardized professional continuing education course on OC that is deliverable nationally.

Conclusion

This study demonstrated the need to improve the educational methods for dental practitioners in Indonesia to enhance their knowledge about and screening practices for OC. Competencies in both these aspects may aid in the prevention and early detection of OC. Dissemination of health information related to OC to the patients and the community, early diagnosis, and prompt referral by dentists can increase the number of cases that are treated at an early stage, thereby improving prognosis.

Conflict of interest

None disclosed.

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