Dentist's Knowledge and Attitude of Oral Lesions Drug Administration in Indonesia

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Abstract

Objective is to investigate the knowledge and attitude among Indonesian dentists in prescribing medication for oral lesions.

A cross-sectional survey recruited 497 dentists from 23 provinces consisting of general practitioners and specialists. A triangulation strategy was undertaken utilizing a quantitative design with a validated 39-item structured questionnaire, followed by a qualitative approach in-depth interview with 15 consenting participants. Logistic regression was used and inductive theme analysis was employed.

Female gender was correlated with dentists' knowledge of oral lesion drug administration (p=0.029), whereas continuing dental education (p=0.025) and a high degree of knowledge (p=0.001) also had a significant impact on dentists' attitudes. 56.1% of dentists treated oral lesions on their own, and 39.5% referred oral medicine specialists. The most prevalent oral lesion themes were trauma-induced and diabetes-related lesions. The majority of respondents were unable to describe the characteristics and appropriate treatment for oral lesions.

The quantitative analysis of dentists' knowledge and attitude in Indonesia revealed a high level, however, the qualitative assessment revealed the inverse. Dentists have difficulty detecting and identifying the various forms of oral lesions and their treatment. Therefore, it is strongly recommended that dentists improve their oral lesion training.

Introduction

Oral abnormalities may occur in a variety of forms and might develop without any warning symptoms. Most of these conditions were asymptomatic, acute, or chronic, with or without systemic involvement. Lesions and other diseases in the oral soft tissues were prevalent in dentistry. Several studies conducted in the China reported that 9.19%-9.56% of adults had oral lesions with varying prevalence rates, including oral candidal lesions in denture wearers at 65%[1], herpes labialis between 20%-40%[2], trauma

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lesions at 1.23%, and oral lichen planus at 1.23%.[3] A total of 16 out of every 100,000 people in Southeast Asia were affected by oral submucosal fibrosis.[4] The prevalence of oral ulceration was 4% worldwide, with recurrent aphthous stomatitis (RAS) ranked as the highest prevalence (25%) among other oral diseases.[5]

Five principal phases involve treating oral diseases, including identifying and eliminating risk factors, symptomatic therapy, causative treatment, supportive treatment, and patient education. Analgesic, anesthetic, anti-inflammatory, antiviral, antibacterial, antifungal, antiseptic, and corticosteroid medicines were administered according to their indications for symptomatic, causal, and supportive treatment. In the management of lesions on the oral mucosa, topical medicines play an essential role.[6–8]

There was only a limited study regarding the utilization of medicine for oral disease treatment among dental students and practitioners. It would be assumed that dental

students' knowledge would increase proportionally to how much they learned and practiced during their training. According to a study conducted in India, the oral disease awareness of primary care physicians was relatively moderate (50%-70%).[9] Meanwhile study on dental students showed that the recognition of oral lesions was not accompanied by positive attitudes in prescribing medicine for these lesions.[10]

Some medications, such as corticosteroids, both topical and systemic corticosteroids, were employed in the treatment of oral disorders such as inflammatory reactions, erythema, edema, and ulcerations.[11] Inadequate or inappropriate administration and prolonged dosage may result in long-term side effects.[7] Hitherto in Indonesia, studies analyzing dentists' knowledge of various oral disorders, therapies, and drug administration procedures have yet to be published.

This study assesses Indonesian dentists' knowledge and attitudes toward prescribing oral medicine drugs. It was anticipated that the result would become basic information for stakeholders (professional organizations and dental education institutions) and consideration for implementing appropriate policy on drugs in oral medicine through dental education, including the potential for developing related curricula in Indonesia.

Materials and methods

This study employed both quantitative and qualitative methodologies. A triangulation strategy was conducted by collecting and analyzing data separately for each methodology. This research examined the knowledge and attitudes of Indonesian dentists in 2021. A quantitative study was undertaken on the technique using a standardized questionnaire, followed by an interview. An ethical clearance was issued (No. 011/S3/KEPK/FKG/8/2021) by the Ethical Commission of the Faculty of Dentistry at Universitas Trisakti.

Quantitative method

A questionnaire was constructed and validated before the study started. The questionnaire consisted of 16 items for knowledge and 23 items for attitude. The knowledge item was using the Guttman scale; score 0 = "incorrect" or "do not know," and 1 = "correct ."The attitude item used three levels of the Likert scale; score 1 ="disagree," 2 ="uncertain," and 3 ="agree." The reliability and validation analysis by the Rasch model was carried out among 50 dentists. The Cronbach alpha is 0.86 with item reliability of 0.84 with separations of 2.25 and subject reliability of 0.83 with separations of 2.24. The eigenvalue of questionnaire unidimensionality was 5.86. Thus this questionnaire was deemed to have good construct validity.

A cross-sectional survey was implemented in Bahasa Indonesia with 551 dentists from 23 out of 34 provinces in Indonesia. The questionnaire was distributed online from October to December 2021. The survey included 39 items of questionnaire and sociodemographic data. Inclusion criteria were dentists who were currently practicing and could use electronic media such as cell phones or tablets. All subjects have agreed to informed consent. A dentist not treating patients directly, such as a dental forensic specialist, was excluded. Outcome data will evaluate both general practitioners and dental specialists for each variable. Knowledge and attitude scores were categorized into three groups (low, moderate, and high). Analysis was done by logistic regression with P<0.05 for significance.

Qualitative method

A qualitative study was conducted using 24 questions developed in conjunction with the theme of the quantitative study. A simple random sampling technique was employed to recruit the participant, which consisted of eight general dentists and seven specialists in different fields (oral surgeon, restorative dentistry, pedodontics, orthodontics, prosthodontics, periodontics, and radiology). Participants were required to provide informed consent before the interview. The interview lasted 30 to 90 minutes and was conducted via internet media from multiple platforms by a single interviewer. All recorded interviews were meticulously transcribed for the blind investigator to study further. Categorical codes were developed based on the conceptual framework of the oral lesion category, its treatment, and the participants' capacity to describe the oral lesions. There are three categories, consisting of 13 types of oral lesions, the ability to describe the lesions, and drug/treatment appropriateness (Table 4). The data were subjected to a general inductive thematic analysis, which resulted in the

development of themes.[12] The principal topics and subthemes were finalized, and meaningful data were allocated in codes. Then, themes were derived from these codes, which reflected information that appeared to create a profile of dentists' knowledge and attitude regarding prescribing medications for oral lesions (appropriateness of treatment). Themes were subsequently reanalyzed and confirmed. Confirmability tries to confirm results, which was accomplished by comparing replies to the point of saturation and cross-examining data.

Results

The most comprehensive knowledge, attitude, and approach to prescribing the medication for the oral lesion were sought after responses in both the survey and the interview. In order to determine how to best address the discrepancies in oral lesions treatment between dentists, participants in both studies were asked to list the most crucial dental health issues that need to be addressed in their community. The main themes demonstrated that fundamental knowledge (the ability to define oral lesions appropriately), attitude towards treatment choices, and decision to do referral were the most frequent barriers to accessing treatment options.

Out of 551 participants, 54 were removed because they no longer practice dentistry (n=40) or because they provided similar data (n=14). Table 1 displays the population's characteristics. The majority of the participants in the study were female (77.9%), with a mean age of 38.82 $\pm$ 10.96 years. The province of DKI Jakarta has the most significant proportion of residents (36.6%), followed by West Java (19.1%), Centre Java (12.5%), Banten (12.5%), and East Java (4.8%). Most subjects were general dentists (74,8%) with less than five years of experience (29.8%).

Table 2 showed a logistic regression analysis between each variable of knowledge and attitude. For knowledge, significance was noted in the female gender (OR 2.59, P=0.029, 95%CI 1.103-6.119). In terms of attitude, significance was found in the dentist who always updates the CDE (OR 6.16, p=0.025, 95%CI 1.259-30.157) and has a high level of knowledge (OR 7.84, p=0.001, 95%CI 3.159-19.466).

Variable	n (%)	Variable	n (%)
Gender		Dentist	
Male	110 (22.1)	General	372 (74.8)
Female	387 (77.9)	Specialized	125 (25.2)
Province		Dental practice (year)	
Bali	5 (1)	Less than 5	148 (29.8)
Banten	61 (12.3)	>5-10	91 (18.3)
Bengkulu	1 (0.2)	>10-15	99 (19.9)
DI Yogyakarta	8 (1.6)	>15-20	50 (10.1)
DKI Jakarta	182 (36.6)	More than 20	109 (21.9)
Jambi	3 (0.6)	Soft tissue examination prior to dental treatment	
West Java	95 (19.1)		
Central Java	62 (12.5)	Always	264 (53.1)
East Java	24 (4.8)	Seldom	221 (44.5)
West Kalimantan	12 (2.4)	Never	12 (2.4)
Central Kalimantan	2 (0.4)	Oral lesion treatment	
East Kalimantan	8 (1.6)	By themselves	279 (56.1)
Bangka Belitung	2 (0.4)	Refer to a medical doctor	14 (2.8)
Riau	8 (1.6)	Referral to oral medicine	197 (39.6)
Lampung	2 (0.4)	Refer to oral surgeon	7 (1.4)
Maluku	1 (0.2)	Oral lesion patient in 2-3 months	
South East Nusa	10 (2.0)	Less than 1	333 (67.0)
Papua	2 (0.4)	More than 1	164 (33.0)
West Sulawesi	1 (0.2)	Continuing education	
South Sulawesi	2 (0.4)	Never	32 (6.4)
Central Sulawesi	1 (0.2)	Sometimes	387 (77.9)
South Sumatera	2 (0.4)	Always	78 (15.7)
North Sumatera	3 (0.6)	Attitude	
Knowledge		Low	-
Low	24 (4.8)	Moderate	83 (16.7)
Moderate	-	High	414 (83.3)
High	473 (95.2)		

Table 1. Population characteristic in quantitative study.

Variables	Knowledge				Attitude			
	OR	P	95% CI Lower	95% CI Upper	OR	P	95% CI Lower	95% CI Upper
Gender								
Male	REFF				REFF			
Female	2.59	0.029*	1.103	6.119	0.904	0.751	0.485	1.685
Dentist								
General	REFF				REFF			
Specialized	0.753	0.551	0.296	1.914	0.680	0.210	0.372	1.242
Oral lesion treatment		0.321				0.710		
By themselves	REFF				REFF			
Refer to a medical doctor	0.463	0.496	0.051	4.247	0.534	0.351	0.143	1.992
oral medicine	0.462	0.096	0.186	1.148	1.160	0.593	0.673	1.999
oral surgeon	0.256	0.246	0.026	2.562	1.104	0.932	0.116	10.543
Oral lesion patient in 2-3 months								
Less than 1	1.038	0.937	0.410	2.629	0.945	0.841	0.545	1.640
More than 1	REFF				REFF			
Continuing education		0.577				0.046*		
Never	REFF				REFF			
Sometimes	0.520	0.356	0.130	2.082	1.735	0.084	0.929	3.239
Always	0.951	0.968	0.081	11.136	6.162	0.025*	1.259	30.157
Knowledge level								
Low					REFF			
High					7.841	0.001**	3.159	19.466

Tabel 2. Logistic regression of knowledge and attitude in prescribing oral lesions drug (Adjusted).

Qualitative data from 15 respondents, mean age of 40.93 ± 10.10 years, comprised of 9 males and six females, and had been practicing dentistry for 15.9 ± 9.61 years. Most participants recognized trauma-induced lesions and oral lesions associated with diabetes mellitus as the most prevalent systemic disease in the oral cavity (Table 3).

Topic	Participant	Quotes
Viral oral lesion	10	Yes, I found herpes lesions just like a pimple around the lips.
	12	I told the patient that this lesion might not be acne. Most probably a virus infection, so don't apply the anti-acne. I will prescribe medication in topical acyclovir gel, along with multivitamins.
Traumatic oral lesion	11	Mostly decubitus ulcer due to sharp restoration.
	14	Actually, it was because of a fractured tooth, so the ulcer was found next to those teeth. I gave Oxyfresh® gel and repaired the tooth.
Oral lesion due to systemic condition	4	Never found, maybe gingival oedematous due to diabetes, others never.
	6	I think gingival enlargement in diabetes may cause food retention, it is the reason for a patient to visit the dentist.
Oral potentially malignant disorder (OPMD)	7	What else for OPMD besides erythroplakia and leukoplakia? Nothing more.
Oral cancer	6	About oral cancer, so far, what I know is a clinical indication based on the color, like bluish, such as epulis.
Fungal oral lesion	9	Regarding fungal infection, I found mostly oral ulcers caused fungal infections such as oral thrush, dentures, sore mouth. I would give nystatin drop, along with mouthwash for fungal infection.
Autoimmune oral lesion	6	Autoimmune, hmm.., oral manifestation I think in periodontal tissue, but I didn't know of any oral ulcer in autoimmune.

Table 3. Quotes from participants (#ID) in qualitative study.

Type Oral Lesion	Describe Oral Lesion (n)			Treatment (n)	
	Able	Unable but know	Not Know	Appropriate	Inappropriate
Normal variant lesion	12	2	1	5	10
Traumatic lesion	4	6	5	6	9
Oral lesion-associated allergy	1	3	11	2	13
Autoimmune oral lesion	0	1	14	0	15
Bacterial oral lesion	1	0	14	1	14
Benign oral lesion	2	0	13	1	14
Fungal oral lesion	5	3	7	5	10
Malignant oral lesion	0	1	14	0	15
Oral potentially malignant disorder	3	2	10	0	15
Pigmented oral lesion	4	7	4	3	12
Salivary gland lesion	6	2	7	0	15
Oral lesion due to systemic condition	1	9	5	1	14
Viral oral lesion	4	3	8	6	9

Table 4. Distribution of informant's knowledge of oral lesions and their ability to describe its treatment.

Table 4 demonstrates that nearly all respondents could accurately describe normal variant lesions; however, only a few administered the correct treatment. Respondents could not describe lesions associated with allergies, autoimmune, bacterial infections, benign lesions, malignant lesions, and OPMD. Some respondents could also describe the lesions associated with fungal and viral diseases. Although most respondents were able to characterize lesions, they could not propose an appropriate treatment for the lesion.

Discussion

There are over 6,000 different types of oral lesions in the oral cavity.[13] They can be induced by trauma, infection, autoimmune, allergic background, or cancer, all of which require an appropriate diagnosis based on their clinical form and symptoms.[10,14,15] In fact, according to the profession of dental curriculum[16] in Indonesia, the oral lesion taught to general dentists only 200 type oral lesions; therefore, dentists may not always be familiar with the other variety of oral mucosal lesions. Moreover, about 44.5% of participants reported that they seldom examined the soft tissue prior to dental treatment, which diminishes their expertise and ability to diagnose and treat oral lesions. Acute oral lesions of many forms necessitate rapid pharmacological therapy. In contrast, if the type of lesion is detected in chronic and oral potentially malignant disorders, then the success rate of healing and prognosis of the lesion will be determined by the diagnosis and following treatment.[6] The involvement of an oral medicine specialist in treating advanced or severe oral lesions is mandatory. Currently, in Dec 2022, there are only 200 oral medicine specialists[17] for a population of 272,229,372 in Indonesia. It is estimated that one oral medicine specialist will serve 1.3 million people distributed over 13,000 islands, which may impact the low detection rate of oral diseases and the medication of specific drugs for certain oral lesions. According to this study, about 56.1% of participants prefer to treat oral lesions by themselves with less accuracy of drug choices, as shown in Table 4.

About 74.8% of respondents in this survey were general practitioners, whereas 25.8% were specialists. It reflects the distribution of dentists and specialists in Indonesia. 53.1% of respondents always examine the oral mucosa before dental treatment, compared to dentists in Australia, who always conduct oral soft tissue

examinations, and in the United States, as high as 94.5%.[18] This may be due to a lack of training, self-assurance, time, and financial incentives, regarded as obstacles to mucosal screening.

Regarding oral lesion treatment, 56.1% of participants treated oral lesions alone, while only 39.6% referred oral medicine specialists. However, based on our qualitative study, the recognition of specific oral lesions was incorrect for all types except trauma-induced lesions and oral lesions linked with diabetes mellitus. Without a previous definitive diagnosis of the oral lesion, the general dentist's first therapeutic option was based on empirical treatment. This result is in line with the findings of Amtha et al., the diagnostic accuracy of dental students in diagnosing oral lesions was 62.9%.[10] The diagnostic accuracy (Cohen Kappa) for diagnosing normal variant lesions reduced to 32,2, and for diagnosing OPMD lesions, it decreased to 0.[10] The correct diagnosis was essential to the treatment and recovery of oral lesions. Based on the findings of Ali et al., dental students were better at recognizing carious lesions than oral lesions (P<0.001).[19] When the oral lesion worsened, a referral was the only option for addressing patient complaints. In addition, most respondents examined only one patient every two to three months; this may be one of the reasons for clinically low recognition of oral lesions, resulting in inadequate diagnostic training. This condition influences the uncertainties surrounding the medication to be administered. Only 15.7% of respondents always participate in continuing oral medicine education, while most participants prefer to update in other fields of dentistry. This data suggests that regular training in the recognition of oral lesions was essential.

About 95.2% of respondents had a high level of knowledge about oral lesions, while 83.3% had a good level of attitude toward medicine prescription implementation. Prior to this point, research on the knowledge and attitudes of dentists regarding oral lesions was extremely limited; the majority of studies solely examined the status of the hard tissue, such as teeth and periodontal diseases. While research in the field of oral medicine more often emphasizes the ability to detect OPMD and cancer lesions rather than oral lesions in general. It may cause the comparative data of dentists worldwide to be very limited in detecting oral lesions in general and may make global dentists' comparative data on oral lesion detection quite limited.

Gender was the only factor influencing the knowledge in prescribing oral lesions (P=0.029). This result is consistent with previous research by Rajeh, which found that females were more aware of oral health and had better practices than males.[20] According to Lipsky et al., men are more prone to disregard their oral health and have poor oral hygiene.[21]

Two factors influence the attitude of dentists in administering drugs for oral lesions: the dentist's participation in dental continuing education (P=0.046) and a high level of knowledge (P=0.001). Allen and Farah stated that continuing education, both in theory and practice, can improve the detection, diagnosis, and accuracy of drug administration for oral lesions.[18] In this study, the number of participants who followed the dental continuing education was very low (15.7%), and showed in the qualitative study that most participants were unable to describe the type of oral lesions appropriately (Table 4).

Qualitative research has been conducted on 15 respondents, consisting of eight general and seven specialist dentists. The participants were asked about oral diseases listed in table 4. In Table 3, many respondents were unaware of the oral manifestations of viral infections. The only recognizable viral infection was herpes labialis, whereas based on data from Banjarmasin, South Kalimantan province in Indonesia, the prevalence of viral infection lesions was 10.07%.[22] This condition differs from data in India and Slovenia, where the prevalence of herpes lesions was only 0.4% to 0.62%.[23,24]

The respondents most easily recognized traumatic lesions due to local mechanical trauma from either sharp teeth or fillings. They also knew how to overcome the factors that cause these lesions and provide appropriate medication. The prevalence of traumatic lesions was 30.08% among other oral lesions, so dentists may often find in dental practice.[22]

Most participants were known to have diabetes as a systemic condition and its manifestations in the gingiva, in the form of gingival enlargement, which was the main manifestation of diabetes that involves the periodontal tissue. However, the manifestations of oral lesions or other conditions of diabetes mellitus, such as xerostomia, candidiasis,

halitosis, submucosal hemorrhage, and prolonged healing, were unknown.

Recognition of OPMD lesions by respondents was particularly limited to erythroplakia and leukoplakia lesions. As for cancerous lesions, the clinical appearance of the lesions was recognized only by the bluish color. This condition indicates that periodic education is necessary to increase awareness of OPMD and cancer lesions. According to Warnakulasuria and Ariyawardana, cancerous lesions originating from OPMD lesions often go undetected because of minimal signs and symptoms, so the patient is unaware of the lesion.[25,26] Moreover, dentists rarely perform oral soft tissue examinations prior to dental procedures and lack knowledge about oral lesions, making both types of lesions less likely to be detected.

Further, in Table 3, participants could not recognize fungal infections and autoimmune lesions. Respondents assumed that most oral ulcers were correlated to fungal infection; thus, antifungals were prescribed. Autoimmune manifestation was not correctly defined in the oral mucosa. One respondent assumed that this disease would impact the supporting tissue of the tooth. Both of these lesions were likely misdiagnosed and mistreated in therapy. Giving the appropiate medicine based on an established diagnosis is an essential competency of a dentist.[27]

In Table 4, few respondents could describe oral lesions and mention the appropriate therapy. The number of respondents who could not describe oral lesions appeared to be more than those who could describe them, except for normal variant lesions, pigmented oral lesions, salivary gland lesions, oral lesions due to trauma, and oral lesions due to systemic diseases. This condition shows that the ability of dentists in Indonesia to detect and diagnose oral lesions is still low, in contrast to the results of quantitative research (knowledge and attitudes showed at a high level), which can already guess the description of the lesion from the questions given. This result also followed the results of a study by Amtha et al., dental students could diagnose normal variant and traumatic lesions more than other oral lesions.[10] According to Gaballah et al., based on the results of a questionnaire that only displays image scenarios and descriptions of lesions, the dentist's ability to detect normal variant lesions is 75%, and oral cancer is 64.62%, while for benign lesions and OPMD it ranges from 32.58% to 35%.[28] The qualitative study's results support the detection of normal variant lesions only, while other oral lesions are less recognizable. Moreover, in detecting OPMD lesions and cancer lesions, the ability of general dentists and specialists needs to be improved by continuing dental education in detecting oral lesions and their treatment. Besides that, training for various health professionals, dental students, and dentists is also necessary to increase the ability to detect oral lesions in primary health care.[10] This initiative of training several primary health care professionals has been recommended by the WHO as a strategy to fight oral cancer by detecting early lesions.[29,30]

Regarding the appropriate treatment of oral lesions by dentists and specialists, most respondents still showed inadequate treatment. This data may be due to the low recognition of the characteristics of each oral lesion. Moreover, the dentist's perception of the oral lesion was not equal to hard tissue pathologies such as caries, periodontitis, etc.[31] This qualitative result is inversely proportional to the quantitative because the interview did not mention the specific diagnosis of oral lesions in the qualitative question, so the respondent's ability to recognize the lesion was greatly reduced. With the low recognition of these lesions, the appropriate therapy becomes non-specific or even falls into mistreatment.

Conclusions

The knowledge and attitude of dentists in Indonesia quantitatively showed a high level, but a qualitative assessment showed in versa. Dentists, both general and specialized, have difficulty detecting and identifying the various forms of oral lesions and their effective treatment. Therefore, it is essential that dentists mandatorily receive further training in detecting and treating oral lesions. A greater emphasis on explaining the characteristics of oral lesions in the curriculum would also be beneficial, as would assessments of clinical oral cases and their respective drug selections.

Declaration of Interest

The authors report no conflict of interest.

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