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ORIGINAL RESEARCH

Initial Management Strategies for Oral Mucosal Lesions Among Local Pharmacists in Saudi Arabia: A Cross-Sectional Study

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Purpose: Pharmacists may be an initial point-of-contact for patients with oral mucosal lesions. The purpose of this study was to investigate the proficiency of pharmacists in recognizing and managing oral mucosal lesions to help formulate educational recommendations for improvements in pharmacist-led patient care.

Methods: Pharmacists in community pharmacies in Jeddah, Saudi Arabia, completed structured interviews that included five images of oral mucosal lesions (Herpes labialis, Lichen planus, Traumatic lip ulcer, Candidiasis, and Squamous cell carcinoma) with short clinical scenarios. Pharmacists were asked how they would manage the patients and about their knowledge of oral cancer.

Results: One hundred and forty pharmacists participated. Herpes labialis was correctly identified by 81.6% of pharmacists, followed by traumatic ulcers (65.2%). No pharmacist correctly identified lichen planus, while squamous cell carcinoma was correctly identified in 14.9% of cases. Lichen planus (51.8%) was most commonly referred to specialist services, followed by squamous cell carcinoma (45.4%). Most pharmacists prescribed over-the-counter medications to treat the lesions. Most pharmacists recommended appropriate antiviral treatment for herpes labialis (70.2%) and wound care for traumatic lip ulcers (71.6%). However, 68.1% referred patients to healthcare professionals. Around 75.2% of pharmacists opted to refer to healthcare providers in cancer patients.

Conclusion: While pharmacists could play a significant role in providing accurate and timely medical or pharmacological advice to patients with oral mucosal lesions, further education and training are required to improve knowledge to inform decision-making.

Keywords: oral mucosal lesions, pharmacists, Saudi Arabia, oral cancer, oral health advice

Introduction

Pharmacists are often one of the first points of contact for individuals with health problems, including oral pain and lesions. Patients commonly go to a pharmacy for medications to manage oral pain, regardless of the cause. Pharmacists are easily approachable and often more accessible than other healthcare providers,[1] as they can usually be consulted without an appointment and provide relatively inexpensive advice.[2–4] In one interview study, 4–10% of individuals reported that they would first approach a pharmacist for advice if they had a persistent or recurrent mouth ulcer.[5] Another cross-sectional study reported that a majority of pharmacists provided oral health advice to consumers up to five times a week.[2]

Oral cancer is one of the most common non-communicable diseases, with an estimated 300,000 new cases worldwide each year.[6] In Saudi Arabia, the incidence of oral cancer varies by region, with the highest age-standardized incidence in Jazan and the lowest in Hail.[7] Most patients with oral cancer in Saudi Arabia present to hospitals with advanced disease and require palliative treatment.[7]

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Onizawa et al conceptualized oral cancer diagnosis into four steps: first, the onset of symptoms to visiting a medical facility; second, from the initial visit to a referral letter to a specialist; third, from receiving the referral to the visit to the specialist; and fourth, from the visit to determining the diagnosis.[8] The duration of the first and third steps depend on the patient (patient delay), while the second and fourth steps depend on the professionals (professional delay).[8] Referral of patients by pharmacists in a timely manner could help reduce professional delay.[9]

The pharmacists' role in reducing professional delay, particularly for referral to a specialist, depends on their reliability in screening and recognizing oral lesions, providing pharmacological advice when appropriate, or referring to a dentist or physician.

Although pharmacists are healthcare practitioners, as defined by the "law of practicing healthcare professions" issued by the ministry of health, their scope of practice is related to drug prescription following a physician prescription and dispensing of medications. They can also help patients with over-the-counter and behind-the-counter medications. The scope of practice does not include diagnosis of any disease or its management.[10] Pharmacists are not encouraged to diagnose or manage oral lesions as they are not licensed physicians and this is not included in their scope of practice, but they should be able to differentiate common and self-limiting lesions from critical and serious conditions with potentially serious consequences such as oral cancer. Therefore, the objective of this study is to assess the proficiency of pharmacists in identifying and managing oral lesions in Saudi Arabia, which will direct future recommendations for improvements of healthcare provided to the public. The null hypothesis was "There is no significant difference in the proficiency of pharmacists in Saudi Arabia in identifying and managing different oral lesions".

Materials and Methods

The King Abdulaziz University – Faculty of Dentistry (KAUFD) ethics committee approved the study protocol (ref number: 062–03-23). This was a cross-sectional study using a convenience sample of pharmacists working in retail pharmacies in Jeddah, Saudi Arabia. Based on the study by Al-Amad et al, it was assumed that a sample size of at least 131 pharmacists would be required to detect 18% differences between lesions correct knowledge or management with 95% power at the 0.05 significance level using a chi-square test.

Pharmacists working in hospital-based pharmacies were excluded as they are not usually a point of contact for the general population. The sample was divided according to geographical location of the city to include the entire city: northwest, northeast, southeast, and southwest (Figure 1).

A member of the research team visited ten pharmacies per day. Participants provided informed consent at the beginning of the interview. Then, they were asked to look at an image of an oral lesion obtained from the Oral Medicine Department at King Abdulaziz University (Figure 2) The images' quality was confirmed by oral medicine consultants. The images were accompanied by a short clinical scenario (Table 1). These cases were chosen to make sure they cover multiple lesions (benign vs malignant) from various disease categories. Also, considering the most common lesions that can be encountered[11,12] Other information regarding the patient's history was only shared if the pharmacist asked for it. The pharmacist's response (advice, referral, or prescription) was recorded.

Pharmacists completed a validated questionnaire consisting of 24 questions separated into 5 sections. In Section 1, pharmacists were provided with pictures of the five lesions. The five lesions shown to the pharmacists and asked to manage were: herpes labialis (viral infection), lichen planus (autoimmune disease), traumatic lip ulcer (reactive lesion), candidiasis (fungal infection), and squamous cell carcinoma (cancer) (Figure 2), chosen to represent a spectrum of significant, common, and etiologically diverse oral mucosal lesions. In Section 2, pharmacists were asked "how would you deal with this patient?". Section 3 collected demographic data on the pharmacist including age, sex, nationality, educational background, and experience. Section 4 recorded the presence of any clinics within a 1-km radius, and Section 5 asked questions about participants' knowledge regarding oral cancer.

After presenting the five scenarios and recording the responses, the pharmacist was asked to complete the questionnaire on their own. The responses were reviewed by the members of the research team and the oral medicine consultant. Answers that included the right diagnosis or the same classification of the lesion were considered correct, one example candidiasis and fungal infection were considered correct. Another example is squamous cell carcinoma and

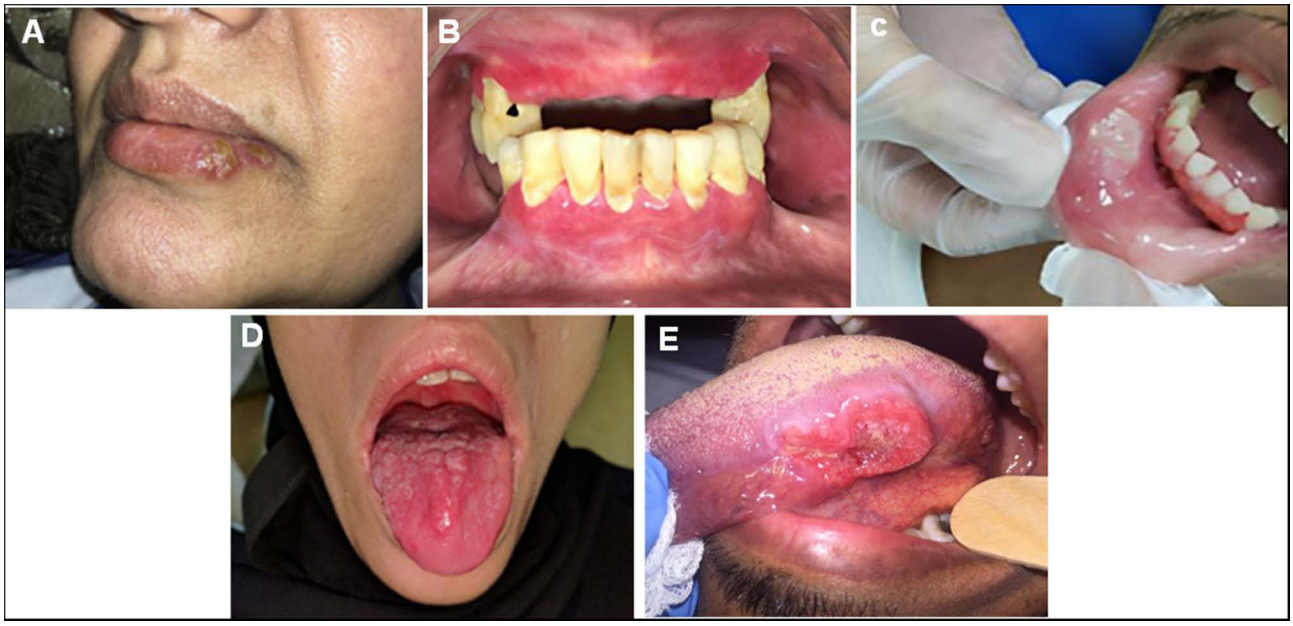

Figure 1 Images of the oral lesions. (**A**). Herpes labialis, (**B**) Lichen planus, (**C**) Traumatic lip ulcer, (**D**) Candidiasis, (**E**) Squamous cell carcinoma (courtesy of Dr Ahmad Othman, Taibah University, Madinah, Saudi Arabia).

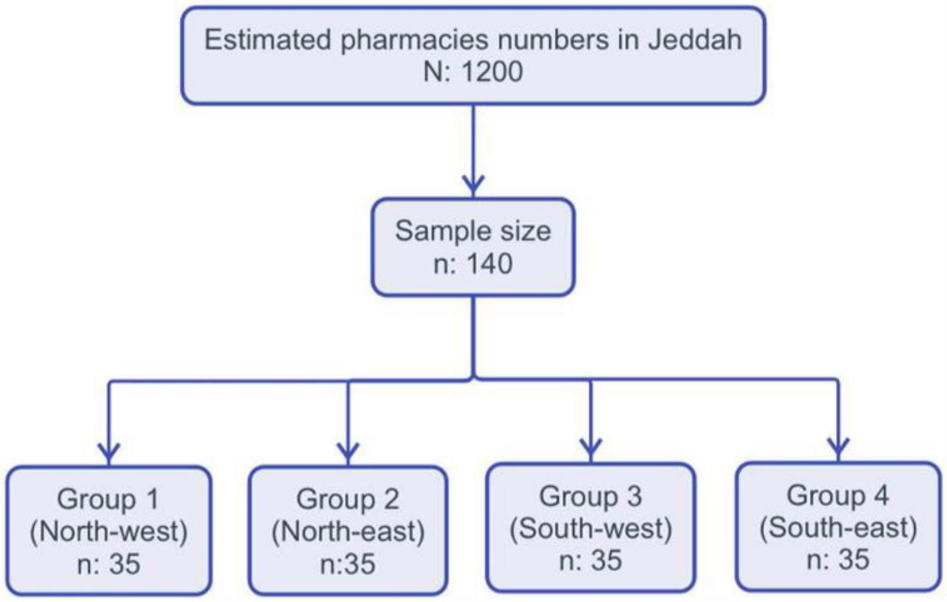

Figure 2 Diagram showing the sampling process.

malignancy were considered correct. The pharmacist management strategy was analyzed and considered correct if it aligns with the standard of care management for each diagnosis.

The questionnaire was validated by experts in Oral Medicine at KAUDF and was modified based on their feedback. Pilot testing was performed prior to the start of the study. The chi-square test was used to compare responses between pharmacists. A total correct identification and management score was computed for each subject, and the means were compared using the independent samples *t*-test. A p-value of 0.05 was considered significant.

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Table 1 The Clinical Scenarios Presented to Pharmacists

Case number	Clinical scenario
1	A 30-year-old female came complaining of a burning sensation in her lower lip. She had flu 1 week ago.
2	A 55-year-old female presented with mouth soreness especially when eating spicy food. History: Itchy and raised skin rash; Duration: 2 days.
3	A 66-year-old male presented with this non-healing ulcer for a month. He feels heaviness when moving the tongue. He has been smoking for 30 years.
4	A 20-year-old male presented with oral ulcers that occurred after accidentally biting his lip.
5	A 30-year-old diabetic female presented with white and red lesions all over the mouth with soreness. The white areas are scrapable. Her HBA1c is 8.5.

Results

Demographics and Practice Environment

One hundred and forty pharmacists in Jeddah participated in this study, with an average age of 34.9 (7.0) years. They were predominantly male (93.6%), and most held a bachelor's degree (96.5%). Participants had a mean of 11.4 (7.3) years of professional experience. About 75.9% of the pharmacies visited were within a 1-km radius of a dental or medical clinic (Table 2).

Table 2 Pharmacist Demographics

Variables		n (%)
Age	Mean ± SD	34.9 ± 7.0
Sex	Male	132 (93.6)
	Female	9 (6.4)
Nationality	Egyptian	104 (73.8)
	Saudi	17 (12.1)
	Yemeni	12 (8.5)
	Others	8 (5.7)
Highest qualification	Bachelor	136 (96.5)
	Postgraduate	5 (3.5)
Country of education	Egypt	104 (73.8)
	Saudi Arabia	18 (12.8)
	Yemen	9 (6.4)
	Others	10 (7.1)
Years of experience	Mean ± SD	11.4 ± 7.3
Dental or medical clinic within 1 km radius	Yes	107 (75.9)
	No	34 (24.1)

(*Continued*)

Table 2 (Continued).

Variables		n (%)
How many customers ask for oral health advise per week	Mean ± SD	22.6 ± 16.7
	10 or less	36 (25.5)
	11 – 20	55 (39.0)
	21 – 30	26 (18.4)
	31 or more	24 (17.0)

Frequency of Oral Health Advice

Approximately 17% of pharmacists provided oral health advice over 31 times per week, while 25.5% provided advice less than 10 times weekly (Table 2).

Lesion Identification Accuracy

The most accurately identified lesion was herpes labialis, with 81.6% of pharmacists identifying it correctly, followed by traumatic lip ulcers at 65.2%. By contrast, no pharmacist identified lichen planus, and only 14.9% correctly identified squamous cell carcinoma (Table 3). The accuracy of lesion identification was significantly different between lesion types ($p < 0.001$).

Management Approaches

Questions about the patients' medical histories varied, such as asking about medical conditions (highest in herpes labialis cases at 9.9%) or smoking history (only asked in 0.7% of cases for lichen planus) (Table 3). Their management choices significantly varied according to the lesion. Most pharmacists recommended appropriate antiviral treatment for herpes labialis (70.2%) and wound care for traumatic lip ulcers (71.6%) (Tables 4 and 5). However, for candidiasis, only 19.1%

Table 3 Lesion Identification

		Herpes Labialis	Lichen Planus	TraumaticLip Ulcer	Candidiasis	SquamousCell Carcinoma	p-value
Identification	Correct	115 (82.1)	0	92 (65.2)	30 (21.3)	21 (14.9)	<0.001
	Incorrect	25 (17.9)	141 (100)	49 (34.8)	111 (78.7)	120 (85.1)	
Management	Correct	99 (70.2)	85 (60.3)	101 (71.6)	27 (19.1)	106 (75.2)	<0.001
	Incorrect	42 (29.8)	56 (39.7)	40 (28.4)	114 (80.9)	35 (24.8)	

Note: Chi-square test.

Table 4 Pharmacists' Management Decisions]

	Herpes Labialis	Lichen Planus	TraumaticLip Ulcer	Candidiasis	SquamousCell Carcinoma
Pharmacist asked about medical conditions (Yes)	14 (9.9)	7 (5.0)	4 (2.8)	4 (2.8)	5 (3.5)
Pharmacist asked about use of medications (Yes)	1 (0.7)	3 (2.1)	1 (0.7)	2 (1.4)	1 (0.7)
Pharmacist asked about smoking history (Yes)	0	1 (0.7)	0	0	0

(*Continued*)

Table 4 (Continued).

		Herpes Labialis	Lichen Planus	TraumaticLip Ulcer	Candidiasis	SquamousCell Carcinoma
Pharmacist identified the lesion?	Yes, correctly	115 (81.6)	0	92 (65.2)	30 (21.3)	21 (14.9)
	Yes, but wrong	8 (5.7)	27 (19.1)	24 (17.0)	9 (6.4)	15 (10.6)
	No	17 (12.1)	114 (80.9)	25 (17.7)	98 (69.5)	105 (74.5)
Pharmacist referred to a dentist (Yes)		4 (2.8)	73 (51.8)	22 (15.6)	41 (29.1)	64 (45.4)
Pharmacist referred to a physician (Yes)		35 (24.8)	12 (8.5)	4 (2.8)	55 (39.0)	42 (29.8)

Table 5 Pharmacists' Choices of Medication

Pharmacists' Choices of Medication (%)							
Lesion	Antiviral	Antibiotics	Antifungal	Analgesics	Cicadrizants	Mouthwash	Others
Herpes labialis	99 (70.2)	6 (4.3)	4 (2.8)	2 (1.4)	6 (4.3)	0	4 (2.8)
Lichen planus	0	6 (4.3)	4 (2.8)	14 (9.9)	38 (27.0)	48 (34.0)	31 (22.0)
Traumatic lip ulcer	0	4 (2.8)	24 (17.0)	9 (6.4)	97 (68.8)	37 (26.2)	10 (7.1)
Candidiasis	0	2 (1.4)	27 (19.1)	0	13 (9.2)	22 (15.6)	7 (5.0)
Squamous cell carcinoma	0	5 (3.5)	10 (7.1)	4 (2.8)	40 (28.8)	27 (19.1)	4 (2.8)

prescribed antifungals, and 68.1% referred patients to healthcare professionals (Tables 4 and 5). Lichen planus and cancer were frequently referred, with 60.3% and 75.2% of pharmacists opting to refer to healthcare providers, respectively (Table 4). There was no difference in the pharmacist's identification or management scores by years of experience or by proximity to dental clinics (Table 6).

General Knowledge Questions Regarding Oral Cancer

Around three-quarters (72.3%) of pharmacists believed that oral cancer can present as an oral swelling, and similar percentage believed that it can present as a persistent ulcer (Table 7). Some participants believed it can present as white or red patches (17.7% and 31.2%, respectively) (Table 7). Only a small proportion of pharmacists (5%) did not know

Table 6 [Comparison of Pharmacist's Performance in Identification and Management of the Oral Lesions by Experience and Proximity to Dental Clinics]

		Identification Score	Management Score
Years of experience	**0 – 10**	1.7 ± 0.9	2.9 ± 0.9
	11 or more	1.9 ± 0.9	2.9 ± 1.00
	p-value	0.108	0.794
Dental or medical clinic within 1 km radius	**Yes**	1.7 ± 0.9	2.9 ± 1.0
	No	2.1 ± 1.0	2.9 ± 0.9
	p-value	0.064	0.718

Note: Independent samples *t*-test.

Table 7 Knowledge Regarding Oral Cancer Risk Factors and Signs and Symptoms

Question	Risk factor	n (%)
Which health behaviors do you believe increase the risk of oral cancer? (choose all that apply)	Smoking tobacco	133 (94.3)
	Chewing tobacco	103 (73.0)
	Alcohol consumption	96 (68.1)
	Being overweight	13 (9.2)
	Infectious diseases	49 (34.8)
	Old age	24 (17.0)
	Others / I do not know	0
Which of the following do you believe might be signs or symptoms of oral cancer? (choose all that apply)	Dry mouth	46 (32.6)
	Abnormal swelling of the mouth	102 (72.3)
	Abnormal swelling of the neck	56 (39.7)
	Pain on swallowing	61 (43.3)
	White patch	25 (17.7)
	Red patch	44 (31.2)
	Persistent ulcer	102 (72.3)
	Others / I do not know	7 (5.0)

Abbreviations: NICE, National Institute of Health and Care Excellence; OTC, over-the-counter; KAUFD, The King Abdulaziz University – Faculty of Dentistry.

how oral cancer presents (Table 7). Most pharmacists knew that chewing or smoking tobacco is a risk factor for oral cancer (73.0% and 94.3%, respectively) (Table 7). Overweight and infectious diseases were considered risk factors for oral cancer by 9% and 34.8% of respondents, respectively (Table 7).

Discussion

The role of the pharmacist in healthcare has evolved and expanded over the years.[2] Community pharmacists can now be found in every neighborhood and are considered the front line of healthcare. For many people, obtaining health advice from a local pharmacist is more practical and convenient than booking an appointment with a practitioner.[1] Therefore, pharmacists face the responsibility of offering medical advice or prescribing over-the-counter (OTC) medications whenever asked. Until now, there has not been a study of pharmacists' competency in screening oral mucosal lesions or their referral practices based on their clinical appearance and symptoms in Saudi Arabia. In this study, we filled this knowledge gap by studying local pharmacists' knowledge of oral mucosal lesions, choices of medications, and referral patterns after showing them five different images of oral mucosa lesions representing different entities chosen to represent a spectrum of significant, common, and etiologically diverse oral mucosal lesions (viral infection, fungal infection, autoimmune disease, reactive lesion, and cancer).

Oral health conditions were encountered regularly by local pharmacists, consistent with other reports. In a study conducted in the UK, 28.8% of participants reported being approached for advice in managing dental pain daily,[13] while 84% of pharmacists in a study conducted in India reported seeing ten patients with dental problems daily,[14] of whom 62% asked for oral health-related advice from the pharmacist. In another study from Saudi Arabia, 29% of pharmacists had more than 30 oral health discussions daily.[15] In the current study, 17% of pharmacists provided oral health advice over 31 times per week, while 25.5% provided advice <10 times weekly. This strongly suggests that pharmacists frequently give oral health advice to the public, making it likely that they will encounter oral lesions and/or oral cancer at some point in their daily practice.

Pharmacists showed significant variability in their accuracy and management choices for different lesion types. While most pharmacists correctly managed herpes labialis and traumatic lip ulcers, there was a high rate of referrals for more complex or severe lesions, reflecting an accurate understanding of when a specialist opinion is needed. In a study from the US, a scenario of a long-standing ulcer on the tongue was presented to pharmacists.[16] Less than 10% of pharmacists referred the case to a doctor or a dentist, and the most prescribed OTC medications were antiseptic mouthwash, antiseptic ointments, and topical analgesics.[16] Another study from the UK presented the scenario of a non-healing ulcer to pharmacists,[17] and 29% of the interviewed pharmacists advised seeing a doctor or a dentist.[17] After interview, the pharmacists were provided with an educational package and then re-interviewed later, which increased the referral rates to 45%.[17] In our study, the referral rate for the oral cancer case – which used a scenario that implied a malignant lesion as a long-standing ulcer – was higher than the US and UK studies.[16,17] Pharmacist education could help reduce diagnostic delay and promote early detection, and therefore treatment, of oral cancer.

In the current study, herpes labialis and traumatic lip ulcer were correctly identified by 81.6% and 65.2% of pharmacists, respectively, and were the most correctly identified lesions, while no pharmacist correctly identified lichen planus and only 14.9% correctly identified squamous cell carcinoma. However, Al-Amad et al reported that most pharmacists correctly identified oral candidiasis and aphthous ulcers (83.3% for each),[18] while lichen planus and squamous cell carcinoma were misdiagnosed as a fungal infection by 28.6% of pharmacists.[18] Most pharmacists correctly identified oral candidiasis (83.3%) and prescribed the correct medication (62.5%). In our study, only 21.3% identified oral candidiasis and 19.1% prescribed anti-fungal medications. This poor recognition of one of the most common lesions of the oral cavity indicates limited knowledge of the signs and symptoms of some oral lesions, consistent with previous work showing that pharmacists' lack of oral health knowledge and training are a barrier to providing optimal oral health advice.[15]

A majority of pharmacists prescribed the correct medication for herpes labialis (antivirals, 75.2%) and traumatic lip ulcer (cicatrizants or wound medications, 68.8%). Most pharmacists misdiagnosed lichen planus as a periodontal problem (51.8%) requiring a dental intervention-like scaling, thus it was the lesion most commonly referred to a dentist. The most suitable management for this case is analgesics for pain management and a referral to a physician or a dentist for diagnosis and symptom control. Around one in ten pharmacists prescribed analgesics for lichen planus in our study compared to 44% in Al-Amad et al.[18]

The scenario provided for squamous cell carcinoma was "ulcer on the side of the tongue, which the patient noticed a month ago, and the patient feels heaviness when moving the tongue". In this case, the correct management is immediate referral. Three-quarters of our sample recognized the need for a referral and advised the patient to go see a physician, which is higher than the 32% reported by Al-Amad et al, 1.8% by Janse van Rensburg et al, 0.8% by Rabiei et al, and 39.39% by Gouraha et al.[18–21]

Pharmacists' knowledge regarding oral cancer risk factors and signs and symptoms was variable. In a cross-sectional study by Saadat et al, 13.1% of pharmacists incorrectly selected fluoride toothpaste use as a risk factor for oral cancer, while most respondents correctly suggested referring patients with signs or symptoms of oral cancer to a medical or a dental practitioner.[22] In another study from the UK, all participants knew about smoking and alcohol consumption as risk factors for oral cancer, and all were aware of the National Institute of Health and Care Excellence (NICE) guidelines to recognize oral ulceration, lumps, or red and white patches. While they also knew the referral guidelines, they faced difficulties and challenges in practice in communication and referral to medical or dental services.[1] In our study, most pharmacists knew about the major risk factors for oral cancer such as tobacco use and alcohol consumption, but they also considered other factors such as being overweight, which is not a known association with oral cancer. Additionally, most pharmacists knew some signs and symptoms of oral cancer, although one in twenty did not know any and 32.6% incorrectly considered dry mouth as a risk factor.

A recent systematic review analyzed the role of pharmacists in early cancer detection and concluded that there is significant potential for community pharmacy-based cancer education and screening. The review determined that cancer screening in community pharmacies is possible and that, by identifying those at higher risk of developing cancer, pharmacists can improve their participation in screening programs.[23] Previous studies have indicated a role for pharmacists in reducing diagnostic delay, early detection, and prevention of oral cancer. If a pharmacist cannot identify

oral cancer lesions or risk factors in undiagnosed oral cancer patients seeking advice for pain relief or treatment, this can lead to diagnostic delay and significantly impact outcomes. Patients will be diagnosed in late stage, which will increase the burden on health care and affect the prognosis and patients' survival.[24] Pharmacists must be more involved in oral cancer screening, initial management, and prevention. This can be improved by providing continuous educational materials and lectures to pharmacists and the recommendation to add oral health modules in pharmacy curricula that is taught by oral medicine staff and includes clinical exposure. Collaboration between the college of pharmacy and the college of Dentistry is encouraged to reach the best method to improve the healthcare system.

Our study design included a relatively structured and standardized interview. However, pharmacists may have altered their behavior or advice in response to their awareness of being observed (the Hawthorne effect). This may have meant that some pharmacists did not give their usual advice, referred the patient, or hesitated in prescribing OTC medication. To overcome this limitation, pharmacists were reassured that they could not be identified within the study and that it would not affect their professional credibility. Future studies may include self-administered questionnaire. This was a cross-sectional study, which limits generalizability and has limited causal inference, and further studies are now needed to determine the actual use and impact of improving community pharmacists' protocols and education regarding oral mucosal lesions.

Conclusion

In conclusion, pharmacists showed significant variability in their accuracy and management choices for different oral mucosal lesion types. While most pharmacists correctly managed herpes labialis and traumatic lip ulcers, there was a high rate of referrals for more complex lesions, which could reflect an understanding of the limits of their training. Pharmacists remain the fastest and easiest way to obtain health advice and avoid delays.

To improve outcomes, targeted continuing education programs are essential to enhance pharmacists' diagnostic confidence and referral accuracy. Collaboration with dental professionals, particularly oral medicine specialists, could foster interdisciplinary support and help establish clear referral protocols. Pharmacists must refer patients to oral medicine clinics when they suspect any oral lesion, regardless of its malignant potential, to ensure timely and appropriate management.

Delays in referrals can have serious consequences, including the progression of potentially malignant disorders and oral cancer, which can significantly affect prognosis and treatment outcomes. Therefore, while symptom relief through pain management may be warranted in select cases, it should never delay appropriate referral.

Implementing structured referral systems and training programs in Saudi Arabia may face practical challenges, such as variability in pharmacists' educational backgrounds and limited access to oral medicine specialists, particularly in rural areas. Addressing these barriers through policy development, integration of referral pathways in pharmacy practice, and leveraging telemedicine solutions could improve patient outcomes and enhance the role of pharmacists in oral healthcare delivery.

Disclosure

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