Original Article

Oral health knowledge, attitude, and self-care practices among pharmacists in Riyadh, Riyadh Province, Saudi Arabia

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Abstract

Aim: Identifying and addressing gaps in the oral health knowledge, attitude, and practices of pharmacists is important before they can be considered as a member of the oral health promotion team. The aim of this study was to determine the prevailing oral health knowledge, attitude, and self-care practices among a sample of pharmacists from Riyadh, Riyadh Province, Saudi Arabia. **Materials and Methods:** A cross-sectional study involving 200 pharmacists working in community- and hospital-based pharmacies was conducted using a structured, self-administered, close-ended questionnaire. The responses were collected and descriptive statistics of the mean scores of knowledge, attitude, and self-care practices were calculated. Mann–Whitney U and Kruskal–Wallis tests were performed to compare the different groups. Spearman's rank correlation coefficient was used to assess the association among knowledge–attitude, knowledge–practice, and attitude–practice. **Results:** Overall, the mean scores of oral health knowledge, attitude, and self-care practices were found to be 5.27 ± 1.05, 3.89 ± 0.83, and 2.1 ± 0.61, respectively. Male non-Saudi pharmacists working in chain pharmacies, having 11–15 years of experience with a Master's degree qualification showed significantly higher mean knowledge and practices scores as compared to their counterparts. Spearman's correlation tests revealed a significant positive correlation of knowledge–practice ($r = 0.262$, $P < 0.01$), whereas knowledge–attitude ($r = -0.149$, $P < 0.05$) as well as attitudes–practices ($r = -0.196$, $P < 0.01$) were negatively correlated. **Conclusion:** Pharmacists exhibited an average knowledge, negative attitude, and inadequate self-care practices toward oral health. However, increasing oral health knowledge can have profound improvement in oral self-care practices.

Key words: *Attitude, knowledge, oral health, pharmacists, self-care practices*

INTRODUCTION

Pharmacies assume an imperative part in the provision of health care and well-being at the community level. Generally, pharmacies have extended working hours, are commonly visited, and conveniently placed within the heart of community dwellings.[1] The pharmacist's contribution is significant in health promotion, health maintenance, and health improvement of the communities in which they serve. Additionally, pharmacists are in a unique position to understand

the needs of community members through daily interaction with patients and customers. In a few areas, pharmacists are often the patient's first point of contact, and for some their only contact with the health care professional.[2]

Pharmacists are capable of providing oral health information based on request by the patient, and a few did it proactively. Most of the pharmacists believed that providing oral health advice is within the realm of their profession.[3] Additionally, individuals with lack of access to dental services and those from lower socioeconomic conditions are more likely to seek oral health-related advice from pharmacists.[1]

At present, a range of products effective in curing several of the oral health ailments and meeting the patient's expectations are available in the market, especially in pharmacies. There are products for managing dental decay, tartar buildup, gingivitis, dental hypersensitivity, teeth staining, and dental erosion, etc. Self-medication with over-the-counter drugs has for quite some time been a typical practice in communities. Presently, people have easy access to certain dental treatments because of the availability of numerous over-the-counter dental remedies, which were available only through the dental professionals in the past.[4]

Due to changes in conveyance of primary health care the role played by pharmacists in the provision of overall and oral health cares has been acknowledged as an important and relevant issue by the government of the United Kingdom.[5] Recently, the pharmacist's function evolved from dispenser of drugs to the approved member of the health care team.[6] A study of pharmacists found that the pharmacist has to face at least one inquiry each week on some mouth-related issue; almost 50% of these inquiries were identified with oral sores or ulcers.[7] Pharmacists provided some oral health advice, and in the coming years the demand for such advice is going to increase for which pharmacists have expressed their readiness to expand their knowledge related to oral health.[8,9]

Data from Saudi Arabia suggested that almost 34% of the pharmacists reported 10 daily requests for oral health advice mainly related to toothache, mouth ulcers, and mouth malodor. These complaints were mainly managed by medications and only very small percentages of the dental patients were referred to the dentist.[10] Most of the recommendations of oral health products made by pharmacists in Riyadh, Riyadh Province, Saudi Arabia were mainly based on personal experience and patient inputs rather than scientific information highlighting deficiencies in oral health knowledge.[10]

There are many ways in which the pharmacist can come forward to provide services such as encouraging the use of fluoridated tooth pastes and soft-bristle toothbrushes, advising on a healthy diet and eating habits, encouraging the use of preventive and therapeutic oral care services, and providing the needed information, skills, and motivation to individuals and caregivers about the prevention of oral diseases. By doing all these, pharmacists can actively participate in oral disease identification, assessment, management, referral, and prevention.[4] Hence, there is a need for the pharmacist to be included as a member of a multidisciplinary oral health squad.[11]

Nevertheless, studies have reported oral health knowledge deficits and important barriers among pharmacists.[11,12] Identifying and addressing gaps in oral health knowledge, attitudes, and practices of pharmacists is of utmost importance before they can be considered as a member of oral health promotion team. Hence, the aim of the study was to determine the prevailing oral health knowledge, attitude, and self-care practices among a sample of pharmacists from Riyadh, Riyadh Province, Saudi Arabia.

MATERIALS AND METHODS

Study design, site and participants

A cross-sectional study was conducted among a sample of pharmacists working in community- and hospital-based pharmacies in Riyadh, Riyadh Province, Saudi Arabia. A list of pharmacies and hospitals in Riyadh was obtained using online business and health insurance directories. From a total of 379 pharmacies, 100 pharmacies and 200 pharmacists were selected in the study by employing a convenience sampling approach based on the ease of accessibility. The study was conducted for 4 months from August 2011 to November 2011.

Determination of sample size

A sample size of 200 was determined by considering a value of 0.05, required power of 0.82, and effect size of ρ 0.18 for one-tailed test for Pearson product coefficient, which is computationally similar to Spearman's rank correlation coefficient. The power analysis was performed by using G★Power software version 3.1. (Franz Faul, Universitat Kiel, Germany)

Questionnaire design

A self-administered questionnaire was distributed to the study participants by trained dental interns and the data were collected. In addition, dental interns provided the needed explanation requested by the respondents. The study questionnaire was designed by a team of dental professionals after a thorough literature review.[13,14] After an initial draft of the questionnaire was prepared in English, it was validated in two steps. First, the questionnaire was sent to dental public health professionals to obtain their expert opinion with regard to its simplicity, relativity, and importance. Second, a pilot study was conducted by selecting a small sample (*n* = 20) of pharmacists, and content authenticity was pretested to determine practicability, cogency, and rendition of responses. Moreover, the pharmacists' opinions were sought to make the questionnaire simpler and shorter. All the amendments were incorporated into the questionnaire while ensuring its consistency with the published literature. Reliability coefficient Cronbach's alpha was found to be 0.76. Data from the pilot study were not utilized in the final analysis. After an in-depth discussion, questionnaire was finalized and subsequently distributed to the pharmacists for their response.

The questionnaire comprised four parts. The first part consisted of demographic information (gender, nationality, qualification, experience, and type of pharmacy) of the respondents. The second part elicited the basic knowledge of oral health, by asking 15 questions about dental plaque, causes, symptoms, consequences, prevention, and treatment of common oral diseases. The third part determined the attitude of the pharmacists toward oral health by asking five questions, in which their responses were assessed through a 5-point Likert scale (strongly agree, agree, indifferent, disagree, and strongly disagree) of agreement. The fourth part assessed the oral self-care behavior by considering three questions on toothbrushing frequency, timing, and material/method.

Every correct response in the knowledge section was scored 1, creating a scale in range of 0–15. The overall knowledge scores were categorized into poor (0–5), average (5.1–10), and good (10.1–15). Similarly, for the attitude section strongly agree and agree responses were scored 1 while indifferent, disagree, and strongly disagree responses were scored 0. Therefore, attitude score ranged 0–5. A mean score of less than 4 was considered as negative attitude while a score of 4–5 was taken as positive attitude. In the oral self-care practices section, more appropriate responses of twice daily brushing, the morning and night after food and toothbrushing with paste were scored 1 with all other responses being scored 0. Hence, oral self-care practice ranged 0–3. A mean practice score of less than 2.4 was considered as inadequate and a score of 2.4 and above was deemed to be adequate for oral self-care practice. The higher the score, the better the respondent's oral health knowledge, attitude, and self-care practices.

Ethical approval

The study was approved by the research center of Riyadh Colleges of Dentistry and Pharmacy. Additionally, written informed consent was obtained from the respondents prior to participation in the study.

Statistical analysis

Data collected through the questionnaire were entered and statistical analysis was performed by using IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp. Descriptive statistics of percentages and frequencies were reported. The mean and standard deviations for knowledge, attitude, and practice scores were calculated. Normality distribution of the data was assessed by applying Kolmogorov–Smirnov and Shapiro–Wilk's tests, which showed significant *P* value ($P < 0.05$) indicating nonnormal distribution of the data. Hence, nonparametric Mann–Whitney *U* and Kruskal–Wallis tests were applied as a part of inferential statistics. Additionally, Spearman's rank correlation coefficient was used to assess the association between knowledge–attitude, knowledge–practice, and attitude–practice. For all statistical purposes, $P < 0.05$ was considered to be statistically significant.

RESULTS

A total of 200 pharmacists responded to the questionnaire, making the response rate 100%. A mjority of them were males (67.5%) of non-Saudi nationality (65.5%). Most of the respondents had (90.0%) a Bachelor of Pharmacy qualification with 40% having 6–10 years of experience. Moreover, a majority of the pharmacists (65%) were working with chains of pharmacies, as mentioned in Table 1.

More than 90% of the study participants had knowledge about the purpose of toothbrushing, prevention of tooth decay and gum disease, that bleeding gum indicated gum disease, that the effect of sweet retention on dentition led to tooth decay, methods of prevention of tooth decay, impact of oral health on general health, and

consequences teeth loss interfering with speech. Around 83% of the study participants knew about tobacco chewing or smoking as the cause of oral cancer and 87.5% agreed about the possibility of moving irregularly placed teeth into the correct position. Nearly 77.5% of the participants said that improper toothbrushing was the reason behind gum diseases and 72.5% said regular toothbrushing and flossing could prevent gum diseases. About 72.5% of the participants mentioned 1–3 months

interval as the duration for changing the toothbrush. Less than half of the study participants knew about that tooth decay and gum disease due to dental plaque and 47% pointed out that the bacteria in dental plaque was the reason for tooth decay. Only 12.5% of the study participants could recognize dental plaque as soft deposit on the teeth and 30% reported that gum disease was the common reason for tooth loss in old age as shown Table 2.

When enquired about the attitude of study participants toward a regular visit to the dentist and replacing missing teeth by artificial teeth, 62.5% and 42.5% responded positively. A very high percentage (94.5%) of the participants strongly agreed that the smoking was a bad habit and 27.5% of the study participants showed a strong disagreement with the statement that dentists care only about treatment and not prevention. Similarly, 88.5% of the study participants showed a strong agreement with the statement that treatment of toothache was similar to the treatment of any other organ in the body, as mentioned in Table 3.

Oral self-care practices among the study participants varied with less than half brushing their teeth twice daily and just 23% brushing in the morning and at night. Additionally, 92.5% of them brushed their teeth by using toothpaste and toothbrush, as shown in Figure 1.

The association of demographic characteristics and mean knowledge, attitude, and practices questions are expressed in Table 4. Male participants showed significantly more knowledge (5.44 vs 4.92, $P = 0.001$)

Table 1: Characteristics of the study participan

	n	Percentage
Gender		
Male	135	67.5
Female	65	32.5
Total	200	100.0
Nationality		
Saudi	69	34.5
Non-Saudi	131	65.5
Total	200	100.0
Qualification		
Diploma in Pharmacy	6	3.0
Bachelor in Pharmacy	180	90.0
Master in Pharmacy	14	7.0
Total	200	100.0
Experience (years)		
0-5	70	35.0
6-10	80	40.0
11-15	25	12.5
16-20	25	12.5
Total	200	100.0
Type of pharmacy		
Chain pharmacy	130	65.0
Hospital-based pharmacy	70	35.0
Total	200	100.0

Table 2: Correct responses to the knowledge questions by pharmacists (*n*=200)

Questions	Responses	*n*	Percentage
Purpose of toothbrushing	Prevention of tooth decay and gum disease	185	92.5
Interval of changing brush	1–3 months	145	72.5
Dental plaque refers to	Soft deposit on teeth	25	12.5
Dental plaque causes	Tooth decay and gum disease	95	47.5
Gum bleeding indicates	Gum disease (inflammation)	185	92.5
Reason for gum disease	Improper brushing	155	77.5
Methods of prevention of gum disease	Regular toothbrushing and flossing	145	72.5
Effect of sweet retention on dentition	Leads to tooth decay	185	92.5
Reason for tooth decay	Bacteria	94	47
Methods of prevention of tooth decay	Regular brushing with fluoridated toothpaste	180	90
Reason for oral cancer	Tobacco-chewing or smoking	165	82.5
Common reason for tooth loss in old age	Gum disease	60	30
Health of the mouth and dentition impact the health of the body	Yes	190	95
Loss of teeth interferes with speech	Yes	195	97.5
Is it possible to move irregularly placed teeth into the correct position	Yes	175	87.5

and practice scores (2.18 vs 1.94, *P* = 0.008) toward oral health compared to their female counterparts. Similarly, non-Saudis and those working in chain pharmacies showed significantly higher knowledge (5.42 vs 4.99,

Figure 1: Oral self-care practices among pharmacists (%)

Table 3: Attitude toward oral health

	SA (%)	A (%)	Ind (%)	DA (%)	SD (%)
Regular visit to a dentist is necessary	62.5	30	2.5	2.5	2.5
Replacement of missing natural teeth by artificial teeth is necessary	31	42.5	19	5	2.5
Smoking is a bad habit	94.5	2	3.5	0	0
Dentists care is only about treatment and not prevention	10	20	15	27.5	27.5
Treatment of toothache is important as any other organ in body	88.5	8	3.5	0	0

SA=Strongly agree, A=Agree, Ind=Indifferent, DA=Disagree, SD=Strongly disagree

P = 0.003 and 5.42 vs 5, *P* = 0.005) and practice scores (2.18 vs 1.94, *P* = 0.007 and 2.19 vs 1.93, *P* = 0.003) compared to their Saudi counterparts and those working in hospital-based pharmacies.
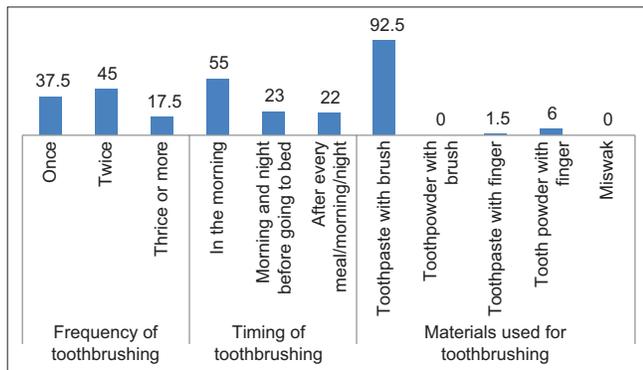
Pharmacists with Master's degree qualification showed significantly higher mean knowledge scores (6.43 vs 5.83 vs 5.16, *P* = 0.001) compared to those with Diploma and Bachelor's qualifications. On the contrary, the mean attitude score was significantly higher among (3.99 vs 3 vs 2.93, *P* = 0.001) pharmacists with Bachelor's degree qualification as compared to those with Diploma and Master's degree qualifications. But the mean practice score was found to be significantly higher among (3.00 vs 2.64 vs 2.03, *P* = 0.001) pharmacists with Diploma compared to those with Master's or Bachelor's degree qualifications. Similarly, pharmacists with 11–15 years of experience showed a significantly higher mean knowledge score as compared to those with 16–20 years, 6–10 years, and 0–5 years' experience (5.96 vs 5.20 vs 5.19 vs 5.14, *P* = 0.008). The mean practice score was significantly higher among pharmacists with 0–5 years of experience (2.27 vs 2.04 vs 2.03 vs 1.92, *P* = 0.027) as compared to those with 16–20 years, 6–10 years, and 11–15 years' experience as shown in Table 4.

The overall mean scores of oral health knowledge, attitude, and self-care practices were reported to be 5.27 ± 1.05, 3.89 ± 0.83, and 2.1 ± 0.61, respectively, suggesting average oral health knowledge, negative

Table 4: Mean and standard deviations of knowledge, attitude, and practice scores

Variables	Knowledge			Attitude			Practice		
	Mean (SD)	Mean rank	*P*	Mean (SD)	Mean rank	*P*	Mean (SD)	Mean rank	*P*
Gender**									
Male	5.44 (1.03)	109.93	0.001	3.82 (0.82)	96.84	0.158	2.18 (0.62)	106.97	0.008
Female	4.92 (1.00)	80.92		4.03 (0.85)	108.09		1.94 (0.56)	87.05	
Nationality**									
Saudi	4.99 (1.01)	84.55	0.003	4.03 (0.82)	107.94	0.148	1.94 (0.54)	87.25	0.007
Non-Saudi	5.42 (1.04)	108.90		3.82 (0.83)	96.58		2.18 (0.63)	107.48	
Qualification*									
Diploma	5.83 (0.41)	133.50		3.00 (0.63)	38.67		3.00 (0.00)	176.50	0.001
Bachelor's	5.16 (1.01)	94.92	0.001	3.99 (0.70)	105.02	0.001	2.03 (0.58)	94.44	
Master's	6.43 (0.94)	158.14		2.93 (1.49)	68.89		2.64 (0.50)	145.79	
Experience* (years)									
0–5	5.14 (0.84)	94.07		3.81 (0.57)	92.11		2.27 (0.61)	114.70	0.027
6–10	5.19 (1.19)	96.06		4.03 (0.66)	107.05		2.03 (0.59)	94.28	
11–15	5.96 (1.14)	136.30	0.008	3.60 (1.55)	101.58	0.008	1.92 (0.70)	86.42	
16–20	5.20 (0.76)	96.90		3.96 (.89)	101.94		2.04 (0.45)	94.74	
Type of pharmacy**									
Chain pharmacy	5.42 (1.05)	108.63		3.82 (.83)	96.51	0.145	2.19 (0.62)	108.19	0.003
Hospital-based	5.00 (1.01)	85.39	0.005	4.03 (.82)	107.91		1.93 (0.55)	86.21	

*Kruskal-Wallis test (P<0.05). **Mann-Whitney U test (P<0.05). SD=Standard deviation*

attitude, and inadequate oral self-care practices as shown in the Figure 2.

The Spearman correlation test revealed a significant positive correlation between knowledge and practice ($r = 0.262$, $P < 0.01$), whereas knowledge and attitude ($r = -0.149$, $P < 0.05$) as well as attitudes and practices ($r = -0.196$, $P < 0.01$) were negatively correlated as shown in the Table 5.

DISCUSSION

Riyadh is rapidly growing capital city with many extension areas built to accommodate the increasing population. Pharmacies were the first to open and provide 24-h service to cater to the health needs of the population before hospitals or polyclinics were opened in such areas. Many of the residents staying in such localities receive some health- and oral health-related advices from the pharmacists. There are a variety of reasons as to why people seek health and oral health advices from the pharmacist in their vicinity. These include financial limitations, nonavailability of hospitals or polyclinics nearby, busy schedule, and difficulty in making appointment with the dentist or physician. The pharmacist's own knowledge, attitude, and oral self-care practices are major determinants for his/her role as an oral health promoter in a community setting. Hence, this study disclosed the knowledge, attitude, and self-care practices toward oral health among a

Figure 2: Mean and standard deviations of knowledge, attitudes, and practice scores among pharmacists

Table 5: Spearman's correlation coefficients between knowledge-attitude (K-A), knowledge-practice (K-P), and attitude-practice (A-P) practice scor

Variable	Knowledge–attitude	Knowledge–practice	Attitude–practice
Correlation coefficient	−0.149[†]	0.262[‡]	−0.196[‡]
P value	0.035	0.001	0.005

[†]*Correlation is significant at the 0.05 level.* [‡]*Correlation is significant at the 0.01 level*

sample of pharmacists from Riyadh, Riyadh Province, Saudi Arabia.

The resent study revealed average oral health knowledge among a sample of pharmacists from Riyadh, Riyadh Province, Saudi Arabia. This could be due to several factors such as the lack of the pharmacist's education and training in oral health, lesser degree of motivation by pharmacists to know about oral health, lack of time, limited interaction with dental professionals, and lack of opportunities for professional development. Additionally, it has been reported that 50% of the pharmacists never met the dental professionals practicing close to their pharmacies though 90% of the pharmacies were located near dental clinics.[10] Knowledge of dental plaque was limited and this finding was lower than that reported among other health professionals.[15] A similar finding of poor oral health knowledge has been reported among Bachelor of Pharmacy students from Malaysia.[16]

In general, male pharmacists showed a significantly higher mean knowledge score as compared to their counterparts. The possible explanation for such a finding could be that most of the male pharmacists work in community-based pharmacies in which many people seek oral health advice and information about oral health care products. On the contrary, female pharmacists predominantly work in hospital-based pharmacies dispensing mainly doctor-prescribed medications to a limited number of patients. This could have resulted in less exposure to oral health information by female pharmacists unlike community-based pharmacists. Moreover, frequent interaction between oral health professionals and male pharmacists might be the reason for increased oral health knowledge among male pharmacists. Another possible factor could be frequent contact between medical representatives and male pharmacists with the former explaining about the oral health care products. The present study result is a contrast to other reported studies in which females demonstrated higher oral health literacy.[14-18]
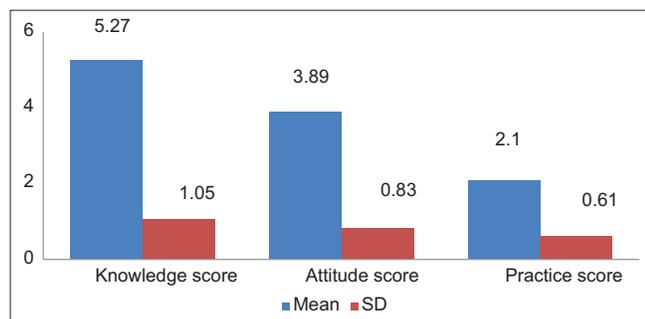
In Saudi Arabia, community pharmacies are either owned by a single person or attached to a network of pharmacies scattered across a city, province, or the country. Additionally, pharmacies can be a part of hospitals/clinics. Most of the community pharmacies are managed by non-Saudi pharmacists while Saudi pharmacists prefer to work in the government sector.[10,19,20] In the present study, non-Saudi pharmacists showed significantly higher oral health knowledge as compared to Saudi pharmacists. The

probable reason could have been a higher content of oral health information in pharmacy education in the institutes from which non-Saudis graduated.

Attitude refers to the inclination to react in a certain way to a certain situation, and to see and interpret events according to certain predispositions.[21] In the present study, the pharmacists exhibited negative attitude and inadequate self-care practices toward oral health. It can be speculated that the average oral health knowledge among pharmacists could be the main reason for such a finding.

In the present study, a significant positive correlation between the pharmacist's knowledge and practice was observed. On the contrary, a significantly negative correlation between knowledge–attitude and attitude–practice was observed. From this finding, it can be interpreted that lack of knowledge adversely influences the attitude leading to poor oral self-care practices of the pharmacists. However, higher oral health knowledge has a direct impact on oral self-care practices by improving the individual's self-awareness, self-protection, and personal hygiene performances.[21]

The strengths of the present study was a sufficient sample size and the varied oral health-related questions designed to disclose an existing level of oral health knowledge, attitude, and self-care practices. The limitations of the present study include the lack of a standard questionnaire for measuring the oral health knowledge and the nonavailability of any reported comparable study instrument. Therefore, the results of the present study were compared to the oral health knowledge of other health professionals. Moreover, the results of present study rely on self-reported data; the oral health information may have been biased through over- and underreporting due to social desirability.

Dental publications offer conflicting results on the impact of the oral health knowledge, attitude, and self-care practices, and oral diseases. However, gathering such data has been useful in planning an oral health education program targeted toward pharmacists. There is scarce data available regarding oral health knowledge of pharmacists toward their own oral health knowledge, attitudes, and practices. To develop a sound strategy for improving the oral health of pharmacists, a more representative database should be made available. For this, additional studies are needed to be conducted in a wide geographic area, preferably by considering a nationally representative sample of pharmacists from Saudi Arabia by using reliable and indigenously developed measures. With enhanced oral health knowledge and practices, pharmacists can serve as oral health promoters in community pharmacy setups by catering to the oral health needs of the society.

CONCLUSION

Pharmacists who were considered in the present study demonstrated an average knowledge, negative attitude, and inadequate self-care practices toward oral health. However, increasing oral health knowledge can have a profound improvement in oral self-care practices. Hence, there is a need to increase the basic oral health knowledge of the pharmacist to improve his/her own oral self-care practices and empower him/her to be utilized as a member of the oral health care team, thereby enabling him/her to provide evidence-based advice and guidance to clients. To achieve this, professional organizations such as the Saudi Dental Society and Saudi Pharmaceutical Society should take proactive steps to provide regular oral health educational programs to pharmacists.

Conflicts of interest

There are no conflicts of interest.

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