

Evaluation of the Knowledge, Practices, Attitudes and Barriers of Community Pharmacists toward Oral Health and Dental Care in North Cyprus

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Received: 04 November 2022 / Revised: 21 December 2022 / Accepted: 22 December 2022

ABSTRACT: Background: Community pharmacists have an effective role in improving and promoting oral health and dental care. Patients could receive counselling from community pharmacists about oral health and dental care after dentists' examinations. Therefore, pharmacists need to develop competency in promoting oral health as part of their health promotion role. **Methodology:** This study was a cross-sectional questionnaire-based study carried out between December 2020 to January 2021 among community pharmacists to evaluate the knowledge, practices, attitudes, and barriers of community pharmacists for oral health and dental care in North Cyprus. **Result:** There were 128 of community pharmacies in Nicosia, North Cyprus. Only 104 (81.25%) of the community pharmacists accepted to participate in this study. Seventy-three of the participants agreed that they would like to play a more active role in promoting and improving oral health. Almost all; 102 (98.1%) agreed that oral health and dental care education should be included in the curriculum of pharmacy, while 78 (75%) and 61 (58.7%) of them feel unconfident when they were giving advice for oral cancer and oral ulcer, respectively. There was no association between demographic factors and the attitude of the community pharmacists toward oral health care. **Conclusion:** This study has shown that community pharmacists do not feel confident when they are giving oral health information about oral ulcers, oral cancer, and discoloured teeth. Most of the community pharmacists agreed that oral health and dental care education should be included in the curriculum of pharmacy.

KEYWORDS: Community pharmacists; Oral health; Dental care; Attitude; Practice; Knowledge; Barriers.

1. INTRODUCTION

Oral health can be defined as being free from any diseases or disorders that withhold an individual from biting, chewing, smiling, speaking, and affecting psychosocial well-being¹. Oral health care is often neglected by the public and common oral diseases affect people of all ages². Most of these diseases are not life-threatening but the outcomes of poor oral health can affect the quality of life and general health^{1,3}. Poor oral health has an association with other health conditions. According to the Academy of General Dentistry, some systemic diseases such as diabetes and cardiovascular diseases show early oral signs and symptoms⁴. Recognizing these signs and symptoms may prevent complications in the future by helping physicians provide better treatment options and improve general health². Most of the oral health products are available in community pharmacies such as toothpaste, toothbrush, mouthwash, whitening agents, breath fresheners, and painkillers. Thus, pharmacists are usually the first health professionals to encounter those looking for advice on oral healthcare⁵. In

How to cite this article: Aydın MD, Birand N, Yazıcı İ. Evaluation of the Knowledge, Practices, Attitudes and Barriers of Community Pharmacists toward Oral Health and Dental Care in North Cyprus. J Res Pharm. 2023; 27(3): 957-966.

addition, pharmacists may have play essential role in the prevention, identification, assessment, and referral of oral diseases and can also assist in oral health care in many other ways such as providing information about oral hygiene, healthy eating, prevention of oral diseases, and promoting fluoride toothpaste⁶. Dentists collaborating with pharmacists can improve oral health care by providing information about dental care and oral products to patients⁷. People commonly consult with community pharmacists for many reasons; such as easy access, long operating hours, established relationships with regular patients, and free of charge consultations. Some patients may prefer to consult community pharmacists over dentists related to their oral health because of financial reasons and the phobia of dentists². There are too many oral health and dental care products without prescription in community pharmacies in North Cyprus, and community pharmacists try to provide information and advice patients that visit the community pharmacy about oral health care. It has not been previously evaluated whether community pharmacists have enough knowledge about oral health care and there are no reported studies on the knowledge, attitude, and behaviours of pharmacists on oral health care in North Cyprus. Hence, the aim of this study was to evaluate the knowledge, practices, attitudes, and barriers encountered by community pharmacists on oral health care in North Cyprus.

2. RESULTS

Only One hundred four (81.25%) of the community pharmacists accepted to participate in this study. The participants were 76 (73%) female and 28 (27%) males. The mean age of community pharmacists was 35.6±9.5. The majority 86 (82.7%) of community pharmacists had bachelor's degrees, 13 (12.5%) Master of Science degree and 5 (4.8%) of PhD degree. Eighty-one of community pharmacists have dental clinic close to their community pharmacy. Only 42 (40.4%) of community pharmacists had received training on oral health and dental care (Table 1).

Table 1. Demographic Information of Community Pharmacists (N=104)

Age group	N (%)
1.Age	
Less than 25 years	1 (0.97%)
25-45 years	87 (83.65%)
More than 45 years	16 (15.38%)
Mean ± SD	35.6±9.5
2.Gender	
Male	28 (27%)
Female	76 (73%)
3.Education Level	
Bachelor's degree	86 (82.7%)
Master of Science Degree	13 (12.5%)
PhD	5 (4.8%)
4. The approximate number of patients visiting the community pharmacy per day;	
Less than 10 patients	19 (19.3%)
10-49 patients	63 (60.6%)
50-99 patients	22 (21.1%)
100 and over patients	0 (0)

Table 1 continued. Demographic Information of Community Pharmacists (N=104)

5.Year of experience of the Community Pharmacist	
less than 3 years	16 (15.4%)
3 years - less than 6 years	41 (39.4%)
6 years - less than 12 years	26 (25%)
12 years and more than 12 years	21 (20.2%)
6.How many hours a week do you work at the pharmacy, generally?	
1 to 16 hours per week	7 (6.7%)
17 to 31 hours per week	11 (10.6%)
32 to 40 hours per week	31 (29.8%)
More than 40 hours per week	55 (52.9%)
7.Do you know of a dental clinic close to your community pharmacy?	
Yes	81 (77.9%)
No	23 (22.1%)
8.Have you received training on oral health and dental care?	
Yes	42 (40.4%)
No	62 (59.6%)
9. Which of the oral health and dental care topics should be given to community pharmacists as training?	
Instructions for use of oral health and dental care products	98 (94.2%)
Prevention of dental caries in children	74 (71.2%)
Dental prosthetic hygiene	86 (82.7%)
Oral Cancer	47 (45.2%)
Gum problems	99 (95.2%)
Dietary recommendations for oral health	79 (76%)
*More than one option can be selected for question 9	

Regarding pharmacist practice, 92.3% stated that they give advice on oral health and dental care. 62.5% stated that they routinely advise patient who buys a toothbrush, toothpaste, or mouthwash (Table 2).

Table 2. Community Pharmacists' Practice toward Oral Health and Dental Care (N=104)

Statements	Toothache	Teething	Toothbrush Preference	Toothpaste Preference	Mouthwash
1. In which situations do you give advice about oral health and dental care?	96 (92.3%)	2 (1.92%)	0 (0)	2 (1.92%)	4 (3.8%)
	Yes			No	
2. You routinely advise a patient who buys a toothbrush, toothpaste, or mouthwash.		65 (62.5%)		39 (37.5%)	
3. You regularly make dietary recommendations or other recommendations to reduce side effects associated with oral health products or medications.		25 (24%)		79 (76%)	
4. How often do you give advice on products about oral health and dental care?	Less than once a month	Less than once a week	1 to 4 times a week	5 to 10 times a week	more than 10 times a week
4.1 Toothpaste	0 (0)	0 (0)	11 (10.6%)	29 (27.9%)	64 (62.5%)
4.2 Mouthwash	3 (2.9%)	7 (6.7%)	58 (55.8%)	20 (19.2%)	16 (15.4%)
4.3 Interdental cleaning	14 (13.5%)	27 (26%)	58 (55.8%)	5 (4.7%)	0 (0)
4.4 Dry mouth products	45 (43.3%)	58 (55.8%)	1 (0.9%)	0 (0)	0 (0)
4.5 Gum protection	21 (20.2%)	47 (45.2%)	29 (27.9%)	4 (3.8%)	3 (2.9%)
4.6 Tooth erosion	47 (45.2%)	57 (44.8%)	0 (0)	0 (0)	0 (0)
4.7 Dental prosthetic hygiene	42 (40.4%)	54 (51.9%)	5 (4.8%)	3 (2.9%)	0 (0)
4.8 Dietary products related to mouth health	76 (73%)	28 (27%)	0 (0)	0 (0)	0 (0)

Regarding pharmacist perceived knowledge, seventy-eight (75%) and sixty-one (58.7%) had no confidence when they were giving advice on oral cancer and oral ulcer, respectively. 45.2% stated that good level of knowledge on issues related to oral health and dental care. 38.5% said that they use websites about oral health and dental care when searching for information on oral health and dental care (Table 3).

Table 3. Community Pharmacists' Perceived Knowledge toward Oral Health and Dental Care (N=104)

1. How would you rate your level of confidence when advising on oral health conditions?	Completely Confident	Confident	Neutral	Unconfident	Completely Unconfident	Score (Mean ± SD)
1.1 Teething	0 (0)	2 (1.9%)	98 (94.2%)	4 (3.9%)	0 (0)	2.98±0.24
1.2 Bad breath	0 (0)	4 (3.9%)	95 (91.3%)	3 (2.9%)	2 (1.9%)	2.97±0.38
1.3 Dental fillings	0 (0)	0 (0)	101 (97.1%)	1 (1%)	2 (1.9%)	2.95±0.29
1.4 Dental trauma	0 (0)	0 (0)	104 (100%)	0 (0)	0 (0)	3.00
1.5 Bleeding gums	0 (0)	3 (2.9%)	98 (94.2%)	3 (2.9%)	0 (0)	3.00±0.24
1.6 Gum diseases	0 (0)	0 (0)	102 (98.1%)	2 (1.9%)	0 (0)	2.98±0.14
1.7 Dry mouth	0 (0)	0 (0)	100 (96.1%)	3 (2.9%)	1 (1%)	2.95±0.26
1.8 Sensitive teeth	0 (0)	5 (4.8%)	94 (90.3%)	4 (3.9%)	1 (1%)	2.99±0.36
1.9 Discoloured teeth	0 (0)	0 (0)	76 (73%)	27 (26%)	1 (1%)	2.72±0.47
1.10 Denture dental problems	0 (0)	2 (1.9%)	97 (93.3%)	5 (4.8%)	0 (0)	2.97±0.26
1.11 Oral Ulcer	0 (0)	0 (0)	43 (41.3%)	47 (45.2%)	14 (13.5%)	2.28±0.69
1.12 Oral Cancer	0 (0)	0 (0)	26 (25%)	49 (47.1%)	29 (27.9%)	1.97±0.73
1.13 Tobacco-related dental problems	0 (0)	24 (23.1%)	79 (75.9%)	1 (1%)	0 (0)	3.22±0.44
Total Score						36.99±2.18
2. How do you evaluate your level of knowledge on issues related to oral health and dental care?						Score (Mean ± SD)
Poor				1 (1%)		
Normal				56 (53.8%)		
Good				47 (45.2%)		2.44±0.52
3. What are the sources you usually use when searching for information on oral health and dental care?						
Websites about oral health and dental care				40 (38.5%)		
Books				8 (7.7%)		
Medical journals				23 (22.1)		
Electronic references and databases				33 (31.7%)		

Regarding pharmacist attitude, 70.1% reported that they would like to play a more active role in promoting and improving oral health. 98.1% agreed that oral health and dental care education should be included in the curriculum of pharmacy. 61.6% did not agree that pharmacists have difficulties in obtaining information about oral health and dental care. The total score of Community Pharmacists' Attitude toward Oral Health and Dental Care was 22.47±2.99 (Table 4).

Table 4. Community Pharmacists' Attitude toward Oral Health and Dental Care (N=104)

Statements	Strongly Agree (A)	Agree (B)	Neutral (C)	Disagree (D)	Strongly Disagree (E)	Score (Mean ± SD)	P-value (A+B vs D+E)
1. You would like to play a more active role in promoting and improving oral health.	43 (41.3%)	30 (28.8%)	26 (25%)	5 (4.9%)	0 (0)	4.07±0.93	0.0001*
2. A dentist-pharmacist collaboration can offer more effective oral health promotion strategies.	22 (21.2%)	24 (23%)	52 (50%)	4 (3.9%)	2 (1.9%)	3.58±0.93	0.0001*
3. You would like to receive further education on oral health by attending continuing professional development courses.	31 (29.8%)	34 (32.7%)	34 (32.7%)	5 (4.8%)	0 (0)	3.88±0.90	0.0001*
4. Oral health and dental care education should be included in the curriculum of pharmacy.	67 (64.4%)	35 (33.7%)	2 (1.9%)	0 (0)	0 (0)	4.63±0.52	-
5. Improving oral health is an important part of the pharmacy profession.	39 (37.5%)	27 (26%)	13 (12.5%)	25 (24%)	0 (0)	3.77±1.19	0.0001*
6. Pharmacists have difficulties in obtaining information about oral health and dental care.	4 (3.8%)	21 (20.2%)	15 (14.4%)	53 (51%)	11 (10.6%)	2.56±1.05	0.0001**
Total Score							22.47±2.99

*A + B is statistically significantly different from D + E, p<0.05,
 **D + E is statistically significantly different from A + B, p<0.05.

Regarding pharmacist barrier, 98% stated that there is a lack of education on oral health and dental care, and 64.4% stated that there is limited interaction between dentists and pharmacists. The total score of Barriers to community pharmacists providing oral health and dental care education in the community was 2.48±0.62 (Table 5).

Table 5. Barriers to community pharmacists providing oral health and dental care education in the community (N=104)

Statements	Yes	No	Score (Mean ± SD)
1.Lack of education	102 (98%)	2 (2%)	0.98±0.14
2.Lack of information to be given to patients	85 (81.7%)	19 (18.3%)	0.82±0.39
3.Limited interaction between dentists and pharmacists	67 (64.4%)	33 (35.6%)	0.68±0.47
Total Score			2.48±0.62

There was no association between demographic factors and the attitude of the community pharmacists toward oral health and dental care (Table 6).

Table 6. Association between demographic factors and community pharmacists toward Oral Health and Dental Care (N=104, 100%)

1.Age		Poor	Good	P-value
Less than 25 years	1 (0.97%)	0	1	0.666
25-45 years	87 (83.65%)	4	83	
More than 45 years	16 (15.38%)	0	16	
2.Gender				0.930
Male	28 (27%)	1	27	
Female	76 (73%)	3	73	
3.Education Level				0.687
Bachelor's degree	86 (82.7%)	3	83	
Master of Science Degree	13 (12.5%)	1	12	
PhD	5 (4.8%)	0	5	
4.Year of experience				0.915
Less than 3 years	16 (15.4%)	1	15	
3 years - less than 6 years	41 (39.4%)	1	40	
6 years - less than 12 years	26 (25%)	1	25	
12 years and more than 12 years	21 (20.2%)	1	20	

3. DISCUSSION

This study has shown that pharmacists would like to play a more active role in promoting and improving oral health and would like to receive further education on oral health by attending continuing professional development courses. The study also showed that the community pharmacists have low or no confidence when giving advice on oral health issues such as oral cancer or oral ulcer.

This situation has supported the lack of sufficient training on oral health and dental care by the community pharmacists. In a study conducted in the Asir region, Kingdom of Saudi Arabia, about 65%

of the community pharmacists 'agreed' and 'strongly agreed' that a dentist-pharmacist collaboration could offer more effective oral health promotion strategies¹⁰. In this study, only 44.2% of community pharmacists 'agreed' and 'strongly agreed' with this statement. A previous study and this study have shown that community pharmacists are willing to cooperate with dentists. We believe that community pharmacists' cooperation with dentists will have positive impacts on the therapeutic outcomes of the patients.

A study conducted in Qazvin, Iran has shown that toothache or mouth ulcers were the most common dental problem for which patients approached the pharmacist for advice¹¹. In another study conducted in Riyadh, Saudi Arabia, patients have mostly asked for advice from pharmacists on toothache, mouth ulcers and bad breath¹². In this study, 96 (92.3%) community pharmacists have given advice mostly on toothache. Also, 65 (62.5%) community pharmacists have routinely advised a patient who buys a toothbrush, toothpaste, or mouthwash in this study. Previous studies and this study have shown that patients generally refer to community pharmacists more than dentists to get advice for issues such as toothache, mouth ulcers and bad breath.

The community pharmacists have shown that they do not have enough confidence in their knowledge when they are giving advice about oral cancer (75%), oral ulcer (58.7%) and discoloured teeth (27%). In addition, 56 (53.8%) of community pharmacists' levels of knowledge on issues related to oral health and dental care were stated to be normal and 1 (1%) of community pharmacists was poor in this study. We think that community pharmacists should attend regular training on oral and dental health for this lack of confidence. Like other health issues, oral health and dental care should be added to the pharmacy curriculum and training programs should be organized on this subject regularly.

In a study conducted in the Eastern Province of Saudi Arabia, a lack of interaction between pharmacists and dental professionals has been recognized as the most important barrier to providing oral health services to clients¹³. On the other hand, the most important barriers of this study were lack of education and lack of information to be given to patients.

This study provides evidence for the need for education to deliver improved oral healthcare services to the community. Oral health and dental care topics should be included in the pharmacy curriculum to provide graduates with adequate information and skills. We recommend organizing seminars and/or training programs for community pharmacists in cooperation with the Ministry of Health and Pharmacist's Association. Therefore, training will improve the knowledge of community pharmacists and eliminate the lack of knowledge in identified topics such as oral cancer and oral ulcers.

Limitations

The study was carried in one city the capital of North Cyprus thus findings could not be generalizable to the whole country. We suggest that a similar study be conducted to cover a more extensive population. Also, the tool utilized was not evaluated for psychometric properties and that it only reflects perceived knowledge in contrast to more objective tools that assess actual knowledge or competency.

4. CONCLUSION

This study showed that community pharmacists do not feel confident enough when they were giving oral health information about oral ulcers, oral cancer, and discoloured teeth. Most community pharmacists stated that there is limited interaction between dentists and pharmacists and a lack of education on oral health and care. Therefore, as a compulsory course, oral health and dental care courses can be included in pharmacy education. Also, oral health and dental care training should be given to community pharmacists on a regular basis. Further studies on this subject need to be done in the future.

5. MATERIALS AND METHODS

Study Design

This study was a cross-sectional questionnaire-based study done between December 2020 and January 2021, among community pharmacists to evaluate the knowledge, practices, attitudes, and barriers to good oral health care in North Cyprus.

Participants

The survey was given to community pharmacies located in Nicosia of North Cyprus and registered with the North Cyprus Turkish Pharmacists' Association. Nicosia is the capital of North Cyprus. There are one hundred and twenty-eight community pharmacies in the Nicosia district. The minimum recommended sample size was 97 calculated by the Raosoft rate⁸. The survey was distributed

to one hundred twenty-eight community pharmacies. Only 104 community pharmacists participated in this study. The rate of participation in the study was 81.25%. There weren't any incomplete survey responses in the study.

Survey Design

An expert panel was formed for the survey with the participation of one dentist, one pharmacologist, two clinical pharmacists and two community pharmacists who were working actively in North Cyprus. This study modified a previously used questionnaire on knowledge, practice, and attitudes of Pharmacists in Lebanon⁹. The modified survey questionnaire was administered to 10 randomly selected community pharmacies to evaluate readability and validity. The pilot study was included in the total sample size. The survey was translated from the English language to the Turkish language using the backward and forward method. The translated questionnaire was distributed to community pharmacists. The time to fill out the survey was approximately 10 minutes. The survey questionnaire had five parts. The first part of the survey included nine questions based on the demographic information of the community pharmacists. The second part of the survey included four questions that were related to the community pharmacists' practices of oral health and dental care. The third part of the survey included three questions that were related to the community pharmacists' knowledge on oral health and dental care with a 5-point Likert scale as completely confident, confident, neutral, unconfident, completely unconfident. For the knowledge scale, participants who responded "5-point Likert score" were given from 5 to 1 point, respectively. The fourth part included six questions that evaluated community pharmacists' attitude toward oral health and dental care with a 5-point Likert scale as strongly agree, agree, neutral, disagree, strongly disagree. For the Attitude scale, an attitude score of less than eighteen was considered poor, while scores eighteen and more was considered as good attitude. The fifth part of the survey had three perceived barrier statements that limit their involvement in oral health and dental care with a 2-Likert scale (Yes, No). For the barrier scale, participants who responded "no" were given "0" points and participants who responded "yes" were given "1" point to determine the barrier status.

Ethical Consideration

This study was approved by the Near East University Institutional Review Board (IRB) (YDU/2020/86-1238). The purpose of the study and the confidentiality statement were explained to the participants and verbal consent was obtained.

Data Analysis

The data of the study were analysed by Statistical Package for Social Sciences (SPSS) and Excel. The data were shown in percentages and frequencies. The Chi-square test was used to assess statistical differences between the response of their perceived knowledge of oral health and dental care. The Chi-square test was used to assess the relationship between social-demographic factors and community pharmacists' attitudes. The p-value of less than 0.05 ($p < 0.05$) was considered statistically significant.

Acknowledgements: The authors would like to thank the following, Roy Yontan and Mazlum Doğan Atasever for their support in data collection.

Author contributions: Author contributions: Concept – M.D.A., N.B; Design – M.D.A., N.B; Supervision – M.D.A; Resource – İ.Y.; Materials – M.D.A., N.B., İ.Y.; Data Collection &/or Processing- M.D.A.; Analysis &/or Interpretation - M.D.A., N.B.; Literature Search – İ.Y., M.D.A.; Writing – M.D.A., N.B., İ.Y.; Critical Reviews – M.D.A., N.B., İ.Y.

Conflict of interest statement: The authors declared no conflict of interest in the manuscript.

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