Is Community Pharmacies' Personnel Well-Oriented about Cosmeceuticals? A Cross-sectional Survey and Costumer Simulation

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Abstract

Background: The cosmetics business is one of the most profitable and advanced global trade sectors, and academic and industrial investments have expanded to provide high-quality products to the right consumers. Thus, this cross-sectional survey assessed Iranian pharmacists and pharmacy technicians' (PT) cosmetic product knowledge, attitudes, and behaviors.

Methods: Between December 2021 and July 2022, pharmacists and PTs who worked in CPs in Tehran province. Demographics were the first questionnaire section after eligibility and consent. Ten questions test knowledge in the second phase. The third portion has nine pharmacist cosmetic product attitudes self-developed questions. We used five-point Likert spectrum scaling. The final component of the questionnaire includes a pharmacist practice checklist. This fulfilled 12 pharmacists' obligations. PT demographics, knowledge, and attitude were measured using an eight-, five-, and eight-item questionnaire. A cosmetic sales checklist with eight practice items was devised to evaluate PTs. Pharmacists and PTs were evaluated for scientific advice on exfoliating lotion and anti-stain sunscreen use, skin type, history, and brand presentation. Using a 95% confidence interval, binary logistic regression found significant relationships between categorical dependent and independent variables. Pearson correlation measured knowledge-performance linearity.

Results: The study included 325 pharmacists and 324 PTs. The average knowledge score for pharmacists was 6.38 ± 1.95, while their practice score was 6.35 ± 1.92 out of 10. The overall knowledge score for PTs was 2.8 ± 0.92 out of 5. Results indicate a strong association between pharmacist and PT knowledge and cosmeceutical performance ($r = +0.635$ and $+0.564$, respectively, $P < 0.001$).

Conclusion: This study indicates community pharmacists and PTs in Tehran have a moderate knowledge about cosmeceuticals. Also, a significant correlation between knowledge and performance was observed in both groups. J Pharm Care 2024; 12(1): 9-16.

Keywords: Cosmetics; Pharmacy Practice; Cosmeceutical Products

Introduction

The cosmetic market is one of the most prosperous and advanced global trade markets globally (1,2). The prevalence of using cosmetic products and their emerging market has led to a lot of academic investigations and industrial investments in this field and efforts were increased to provide high-quality products to the right consumers (3-5). According to studies in the United States, more than 45% of these products were sold in pharmacies (6). Therefore, pharmacists and their assistants in the community pharmacy (CP) staff should be well acquainted with the various regulatory and clinical aspects of cosmetics products so that they can benefit from their large market share to improve health (7,8). Indeed, using these products could be associated with much harm if it is not based on scientific information. In addition, ineligible or counterfeit products containing heavy metals and other inappropriate entities might interfere the human health and quality of life, and what could be overcome is to have sufficient knowledge, apprise consumers about these products, monitor, and update their knowledge (9-11).

Cosmeceuticals that were frequently sold in pharmacies were similar to medicines as they have desirable effects and adverse reactions (12-14). Some cosmetics have

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active pharmaceutical ingredients and pharmacists are required to be well-informed about them (15). In recent years, more attention has been paid to analytical testing and clinical safety monitoring of the possible detrimental properties of cosmetics (16,17).

Pharmacists and pharmacy technicians (PTs) need to ensure a full education and alertness of how the cosmetic products have been applied, what their beneficial or injurious effects are, possible hypersensitivities, and the precautions related to them (18,19). So, pharmacists have to improve their considerable information about the ingredients of these products and how to deal with side effects and their misapplication, as well as train their PTs in this regard (13,20,21).

So far, few studies have been conducted to evaluate the knowledge of healthcare providers, especially pharmacists, in the field of cosmetics and their performance in conveying correct and practical information to clients (7,12,22). So, this study aimed to assess the knowledge, attitude, and practice of pharmacists and PTs in Tehran, Iran, about cosmetic products that were available in CPs.

Methods

A descriptive-analytical cross-sectional survey was conducted to assess the knowledge, attitude, and practice (KAP) of pharmacists and PTs regarding cosmetic products in the Iranian health system.

Between December 2021 and July 2022, pharmacists and PTs who worked in CPs in Tehran province were asked to enter the study. After brief explanations by the field researcher and an explanation of the goals and importance of conducting this survey, pharmacists and PTs who desired to participate in the survey entered the process of checking the eligibility for participation and conducting demographic information.

Using Krejcie and Morgan's sample size estimation table (23), the number of participants needed for pharmacists and PTs was measured separately. The samples were selected by simple random sampling method using the database of pharmacies in Iran developed by the Iranian Food and Drug Organization (FDO).

A Persian prototype questionnaire with four sections was developed by an expert panel to assess the KAP in CPs about cosmeceuticals. Qualitative outward, content validity index (CVI), and content validity ratio (CVR) have been measured by an expert panel who reviewed the content of the questionnaire, noting the relevance and generalizability of the questions. The questionnaires

and checklist were reviewed by 30 experts in the fields of pharmaceutics, pharmaceutical services, and management. So that, some questions were removed, replaced, or reworded. Then, the quantitative validity was examined with 15 experts using CVI and CVR, and questions with low scores were removed. Cronbach's alpha was calculated to check the reliability and internal consistency. Cronbach's alpha in this study, 0.74 for pharmacists and 0.68 for PTs questionnaires ensures the reliability of the questionnaires.

The first questionnaire section is related to demographic and individual information which includes nine items related to the age, gender, education level, and place of study, university of graduation, graduation year, work experience, and hours of daily practice in CP, location, and ownership of the pharmacy. The second section includes ten questions to assess the knowledge of pharmacists about cosmetic products. The third section includes nine questions about pharmacists' attitudes toward cosmetic products. In this section, the five-point Likert spectrum scaling questionnaire had been used from completely agree to disagree. Finally, pharmacists' practice was evaluated based on a checklist that was aligned in the last part of the questionnaire. It complied with 12 actions of the pharmacists that were expected to perform in their workplace. Based on the expert opinion, we divided the practice scores into three levels: weak (0 to 4 positive practice), moderate (5 to 8 positive practice), and good (9 to 12 positive practice). A different questionnaire was designed to take the demographic information, also evaluate the knowledge, and attitude of PTs, which respectively has eight, five, and eight questions. To evaluate PTs' practice, a checklist was developed which included eight practice items that were expected to be performed at the point of cosmetic sale by PTs. The performance of pharmacists in the field of scientific advice on the use of appropriate exfoliating cream and anti-stain sunscreen and the performance of PTs in the field of skin type, history of use, and presentation of different brands were evaluated. The level of performance of these was also divided into three groups: weak (0 to 4 positive practice), moderate (5 to 6 positive practice), and good (7 to 8 acceptable practice). Finally, the questionnaires, which include questions and checklists, were translated by the translate-retranslate method for language validation. All validated questionnaires and checklists are shown in the supplementary file.

In this study, to minimize sources of bias, the selection of participants was completely random, and also to avoid the concentration of participants in certain parts of the investigated area, Tehran province was stratified into

five equal geographic regions, and from each region, the number of Equal number of participants were included in the study. Also, the performance evaluation process of pharmacists and PTs is independent of the time of knowledge and attitude evaluation, and the participants in the study were evaluated by a simulated client and did not know the time of their performance evaluation.

The statistical analyses were performed using Microsoft Excel 2019 and SPSS version 25.0 (Chicago, IL, USA). Microsoft Excel was used for editing, sorting, polishing, and coding of data. The Excel file was imported into SPSS software. Pearson correlation was used to evaluate the linear relationship between the results of knowledge and performance with each other and with demographic information. Descriptive statistics (frequencies, percentages, means, and standard deviations) and first-order analyses (i.e., chi-square tests) were performed. Binary logistic regression was performed with a 95% confidence interval to determine significant associations between categorical dependent and independent variables.

Results

In the time period when the questionnaire distribution was conducted, 360 pharmacists and 363 PTs were assessed to complete the questionnaires. Out of them 325 pharmacists and 324 PTs completed the knowledge and attitude questionnaires. Accordingly, these participants were candidates for blinded-performance evaluation by a simulated client. The demographic information of the participants is listed in Table 1.

The demographic information of the participants is listed in Table 1. More than half of the participants in the study were less than 30 years old (52.1%), and among the pharmacists, the dominant population was male (62.2%), and in PTs were female (67.6%). The curve of working hours in both groups is almost normal, but the curve of work experience years in both groups has positive skewness (Pharmacists skewness= 1.551, PTs skewness= 1.987).

Table 1. Demographic characteristics of pharmacists and PTs.

Demographic Categories	Subgroups	Frequency Pharmacists (N= 325)	Subgroup	PTs (N= 324)
Age (31.76 ± 4.89 in pharmacists, 29.79 ± 5.43 in PTs)	<30	128	<30	210
	30-40	153	30-40	105
	>40	46	>40	9
Gender	Male	202	Male	105
	Female	123	Female	219
Education Level	Bachelor	1	Under diploma	20
	Master/Pharm.D.	323	Diploma	123
	Ph.D.	1	Higher degrees	181
Education Place	Iran	314		
	Foreign countries	11		
Education University	TUMS*	69		
	SBMU	59		
	IAU	39		
	SUMS	35		
	Other	123		
Work Experience (8.39 ± 4.59 in pharmacists, 6.73 ± 3.63 in PTs)	<10 years	239	<5 years	114
	10-20 years	84	5-10 years	177
	>20 years	2	>10 years	33
Work Hours/Day (7.67 ± 1.49 in pharmacists, 8.68 ± 2.35 in PTs)	Low (>4 hours/d)	3	Low(>5 hours/d)	15
	Moderate (4-8)	232	Moderate (5-10)	252
	High (<8)	90	High (<10)	57
Pharmacy Location	Urban	311	Urban	313
	Rural	0	Rural	0
	Hospital	14	Hospital	11
Pharmacy Ownership	Yes	60		
	No	265		

* TUMS: Tehran University of Medical Sciences, SBMU: Shahid Beheshti Medical University, IAU: Islamic Azad University, SUMS: Shiraz University of Medical Sciences.

A questionnaire designed to assess the level of knowledge of pharmacists including ten questions about different clinical and scientific aspects of cosmeceuticals including indications, properties, components, and side effects of cosmetic products. For PTs, it included five questions in the field of cosmetics. The average knowledge level of pharmacists out of 10 was 6.38 ± 1.95. Based on the expert opinion, we categorize the level of knowledge into three levels; weak (0 to 3 correct answers), moderate (4 to 7 correct answers), and good (more than 8 correct answers). According to these categories, in our study, 29.8% had a good level, 57.2 % of pharmacists had a medium level of knowledge, and 12.9% had a poor level. The overall knowledge score of the PTs was 2.8 ± 0.92 out of 5. Their knowledge was also stratified into three levels based on the number of correct answers; weak (one or two correct answers), moderate (three correct answers), and good (four or five correct answers). Out of 324 PTs, 22.8% had a good level, 43.6% had a moderate level of knowledge, and 33.6% had a poor level.

In general, pharmacists and PTs participating in the study agreed with the provision and selling of cosmetic products in CP. However, a significant number of participants (47.4% of pharmacists and 34.9% of PTs) in this survey were not sure about the adequacy of their guidance and scientific recommendations for CP applicants. The number of pharmacists who do not consider the level and amount of education in the field of cosmetics in pharmacy schools to be sufficient was more than twice the number of pharmacists with the opposite attitude, and 43.7% of pharmacists did not mention any impression about this. Pharmacists participating in the study felt more responsible for the cosmetic products available in CP and showed a higher willingness to take retraining courses than PTs as the results reported in Table 2 show. Based on the opinions of pharmacists and PTs, CP clients have a higher acceptance of PTs' recommendations and the acceptability of pharmacists' opinions for clinicians regarding cosmeceuticals. Finally, in the field of control and regulation of cosmetic products, PTs had a more positive attitude than pharmacists and believed that the performance of supervisory organizations was appropriate, while 55.7% of pharmacists disagreed or strongly disagreed.

Table 2. Attitude status among CP personnel.

Attitude Proposition	Strongly Agree	Agree	No Idea	Disagree	Strongly Disagree
Pharmacists					
CP is a suitable place to provide cosmetics.	219	102	3	1	0
CP should be able to offer all kinds of cosmetic products.	236	81	6	2	0
Scientific information that pharmacists can provide for cosmetics is enough.	37	111	154	22	1
Education level about cosmetics in pharmacy schools is sufficient.	2	54	142	107	20
Specialized retraining courses to update scientific information are necessary.	208	109	5	3	0
Pharmacists are legally responsible for the cosmetic products provided by CP.	183	106	28	8	0
People adhere to the pharmacist's advice about cosmetics.	29	175	112	9	0
Clinicians accept the pharmacist's advice about cosmetics.	109	174	28	14	0
Control on the provided cosmetics is appropriate.	1	26	117	154	27
PTs					
CP is a suitable place to provide cosmetics.	247	44	33	0	0
CP should be able to offer all kinds of cosmetic products.	214	33	44	33	0
Scientific information that PTs can provide for cosmetics is enough.	34	155	113	22	0
Retraining courses to update scientific information about cosmetics is necessary.	77	153	74	20	0
PTs are legally responsible for the cosmetic products provided by CP.	33	55	99	94	43
People adhere to the PT's advice about cosmetics.	43	193	77	11	0
Clinicians accept the PT's advice about cosmetics.	11	120	171	22	0
Control on the provided cosmetics is appropriate.	33	140	107	44	0

* PTs: pharmacy technicians, CP: community pharmacy.

To evaluate the performance of pharmacists and PTs in providing services and scientific recommendations to CP clients, 12 and 8-item checklists were completed by a simulated client, which the participant in the study did not know about. The results of this assessment are shown in Figure 1 for both pharmacists and PTs. For each participant, the number of positive performances (accepted performance according to the checklist) was calculated.
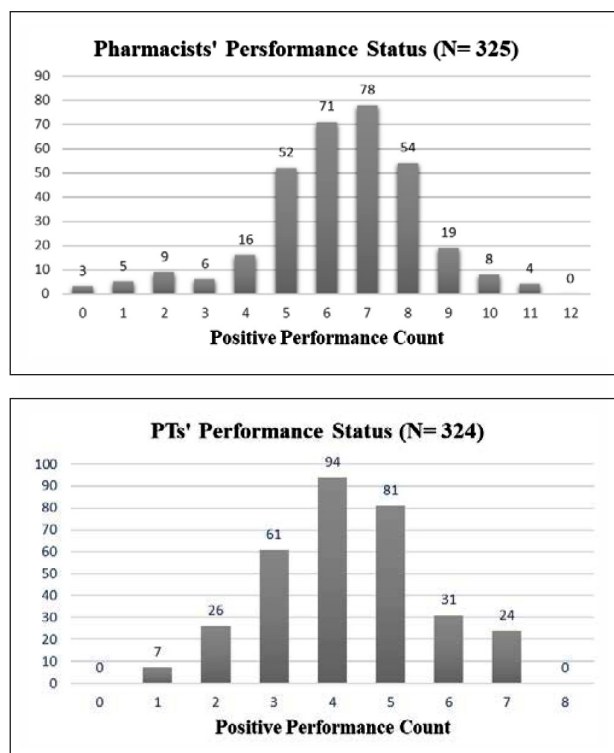

Figure 1. Descriptive results of performance.

We recorded the expected actions of pharmacists and PTs in the checklist when they delivered exfoliators and anti-stain sunscreens. For pharmacists, the highest frequency was for those with seven positive actions and the average practice score was 6.35 ± 1.92. The results suggested that 9.5% (N= 31), 78.5% (N= 255), and 12% (N= 39) of pharmacists have good, moderate, and weak practice levels, respectively. For PTs, the highest percentage of those who performed positively was four/five positive actions, and the mean practice score was 4.25 ± 1.40. The results demonstrated 58% (N= 188) of PTs had a weak level of practice, 34.6% (N= 112) had a moderate level and just 7.4% (N= 24) had a good practice.

The chi-square test was used to evaluate the relationship between discrete demographic variables. Based on these analyses, no significant difference was observed between knowledge and performance against age, ownership, pharmacy location, and level of education in pharmacists

and PTs (P > 0.05). However, the university where he studied showed a high difference between domestic and foreign pharmacists. In this way, the pharmacists who graduated in the country developed much higher knowledge and practice (X2= 165.6, df= 22, P<0.001).

The results of continuous variables using the Pearson correlation test are shown in Table 3. The age variable had a strong inverse relationship with knowledge and performance in both pharmacists and PTs. Also, the performance of both groups in presenting materials to the simulated client had a strong inverse relationship with the level of professional experience of the participants (P<0.05).

Based on the results obtained from the analysis of knowledge and performance among pharmacists and PTs, a strong direct relationship between knowledge and performance level in the field of cosmeceuticals was observed (r= +0.635 and +0.564, respectively, P<0.001).

Table 3. Pearson correlation between continuous demographic characteristics versus knowledge and practice.

Pharmacists	Knowledge	Practice
Age	-0.178	-0.310
Experience	-0.109	-0.254
Work hour/day	+0.026	+0.025
PTs		
Age	-0.251	-0.306
Experience	-0.153	-0.185
Work hours/day	+0.076	-0.087

Discussion

In this study, the result showed that the level of knowledge, attitude, and practice of PTs regarding cosmetic products in Tehran CPs is moderate. However, in a similar study conducted in Mashhad in 2011 on the knowledge and practice of pharmacists about sunscreens and moisturizers, the level of knowledge of pharmacists was tagged as "very poor" (16). This difference in results might be related to the different contexts of these two cities and also the time of the study. As in Tehran, the use of these products is more common than in Mashhad, pharmacists working in Tehran pharmacies had more experience than those in Mashhad and, consequently more knowledge about them. To improve their knowledge for better responding to the clients' requests.

A similar study was conducted by Sencan et al., in 2007 in Turkey to determine the level of knowledge and the role of pharmacists in the field of skin cosmetics, outcomes were similar to our study, although in terms of the time

these two studies were different (6). According to the opinions of pharmacy graduates in Iran and pharmacy graduates in Turkey in this study, not only the educational material in the field of cosmetics was better in Turkey than in Iran, but also more customers of cosmetic compounds in Turkey may lead to better knowledge and practice of community pharmacists in this field. The results of our study presented the level of knowledge of pharmacists regarding cosmetic ingredients was 6.38 out of 10 which means a moderate level, and the level of knowledge of PTs about cosmetics was 56% (2.80 out of 5), which was lower than moderate.

Pharmacists, as healthcare providers who are easily to available all people, can give appropriate advice to clients, and due to the non-cost consultation of pharmacists, people prefer to go to the pharmacy and consult with pharmacists about treatments, medications, and cosmetics (16). So, a high knowledge level of PTs like pharmacists is crucial to improving public health, especially in developing countries (24). Based on this study's results, with increasing working experience, knowledge was decreased, which is in line with the decrease in the level of knowledge with increasing age. The result obtained on practice showed that the average level of practice of pharmacists is 6.35 out of 12 (52.9%), which is also moderate. Considering the importance of the practice of pharmacists regarding cosmetic ingredients, and the effect they can have on the level of public health, it is better to empower them to try to have better and more appropriate practices. Practice is affected by several factors in which knowledge level is very important. Although Knowledge gained through understanding does not necessarily lead to the desired behavior (25,26); In this study, the positive relationship between knowledge and practice confirmed this effect. So, in this situation emphasizing knowledge improvement is a highly effective strategy for improving practice.

In line with this study which showed the level of knowledge was lower in older PTs, Movaffagh et al., research also showed that young pharmacists had more knowledge than older ones (16). The main reason for the decline in knowledge with aging is a decrease in the amount of study due to reduced motivation and a lack of study opportunities for them. Pharmacists' are not satisfied with the amount of scientific information that they can provide to patients, and also are not satisfied with the level of teaching about cosmetics in their universities. Despite the pharmacists accepting their responsibility for dispensing cosmetics, PTs do not believe that they have any responsibility for the cosmetics provided by the pharmacy. This regard. So, improving this attitude can strengthen the performance of PTs. Examining the relationship between knowledge and practice, we concluded that more knowledge led to better practice ($r$pharmacists= +0.635 rPTs=+0.564, P<0.001).

This research has also shown that people are interested in consulting a pharmacist instead of a doctor because of the appropriate knowledge of the pharmacist. So, pharmacist knowledge regarding cosmetics is a societal request. Not only pharmacists' knowledge and practice on the pharmacist is public request and lead to improving public health, according to a 2007 study by Sencan et al., increasing the level of knowledge of pharmacists can increase the supply of cosmetics in pharmacies and thus help the pharmacy economy and sustainability (15). Therefore, improving pharmacists' and non-pharmacists' knowledge about cosmetics will be a win-win game for CPs and consumers.

From the analysis of the results of this cross-sectional survey can be concluded that the knowledge level was low to moderate among the CP personnel including pharmacists and PTs. Also, the knowledge level has a strong direct correlation with practice status and an indirect correlation with age and years of work experience. Thus, continuous education courses are highly recommended to improve services regarding cosmeceuticals in CPs.

Conflict of interest

The author declares no conflict of interest, financial or otherwise.

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PLEASE CITE THIS PAPER AS:

Yousefi N, Noqani H, Mohammadnezhad G, Foroughi MJ, Peiravian F. Is Community Pharmacies' Personnel Well-Oriented about Cosmeceuticals? A Cross-sectional Survey and Costumer Simulation. J Pharm Care 2024; 12(1): 9-16.