
Assessment of pharmacists' knowledge, attitude, and practice toward over-the-counter medications in Erbil city: A cross-sectional study

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Abstract

Background and objective: Over-the-counter (OTC) drugs are those that are available to the general population without a prescription from a physician. Analyzing pharmacists' knowledge, attitudes, and practices about over-the-counter (OTC) medications in Erbil was one of the study's objectives, in addition to establishing a connection between the knowledge, attitude, and practice of pharmacists and their sociodemographic characteristics.

Methods: Descriptive cross-sectional study was conducted among 350 pharmacists. The convenience sampling method was used for sampling and data were collected to assess pharmacists' knowledge, attitudes, and behaviors regarding OTC medications in Erbil city through using a standardized, self-administered questionnaire.

Results: Pharmacists' positive attitude and practice level were 46.3% and 49.1%, respectively, also about two thirds (66%), lacked sufficient knowledge. Training participation was low, only 28% of pharmacists received OTC medication-specific training in the previous year. Age and attitude were significantly associated ($P = 0.05$). There were statistically significant correlations between knowledge and practice ($P = 0.014$), knowledge and attitude ($P = 0.038$), and attitude and practice ($P = 0.001$).

Conclusion: The findings underscore a critical need for targeted continuing education programs to improve pharmacists' competencies in OTC medication counseling and ensure patient safety.

Keywords: Attitudes, Erbil, Knowledge, Over the counter, Practice, Pharmacists.

Introduction

Over-the-counter (OTC) medications, often referred to as nonprescription pharmaceuticals, are those that the general public can buy and use without

a doctor's prescription. Patients can take care of minor health conditions on their own using this simple approach. When taken according to the directions

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on the label and the guidance of a healthcare professional, over-the-counter medications are both safe and effective (1). Both people and the healthcare system benefit from non-prescription medications, which encourage self-care and reduce the strain on medical institutions (2). The use of over-the-counter medications has increased significantly in recent years. According to a recent survey conducted in Spain, 78.9% of the population utilized over-the-counter medications, with the highest rates occurring among students (85.7%) and individuals under the age of 25 years old (85.5%) (3). Although nonprescription medications are generally regarded as harmless and safe, improper usage can lead to a number of health issues, including negative outcomes (4). According to a study done in a community pharmacy with an older population, 95% of participants had at least one potential misuse occurrence (5). Globally, the use of over-the-counter drugs is increasing, and pharmacists are crucial in making sure that these drugs are taken properly. Their information and communication with the patient are closely linked to the patient's safety (6). According to a recent study conducted in Ethiopia, the quality of pharmacists' advising was linked to increased patient satisfaction and adherence (7). Another study suggests that pharmacists need to be knowledgeable of over-the-counter medications that have the potential to be abused (8). In Erbil, Kurdistan,

a survey of pharmacy staff was conducted. Pharmacy employees generally lacked competence; pharmacists knew more about over-the-counter medications, but still not very much. Of pharmacists, 46.2% possess sufficient expertise (9). According to a survey done in Erbil, 52.6% of people use over-the-counter pharmaceuticals without the necessary knowledge, making self-medication rather frequent. As the first point of contact for those in need of help, pharmacists are crucial, according to the report. They play a key role in preventing OTC abuse and misuse (10). There has been little research on this topic in Kurdistan as a whole, in addition to Erbil city, despite the fact that the use of OTC medications has increased in Erbil city and that there is a knowledge gap based on previous studies. This underscores the necessity of investigating this topic inside Erbil. A KAP study, as stated by the World Health Organization, assesses the knowledge, beliefs, and actions of an individual about a specific health topic (11). In this study, self-perceived knowledge was assessed, which refers to the self-reported grasp of the pharmacists about regulations, classifications, legal implications, and potential dangers of OTC drugs. The attitude of the pharmacists reflects their beliefs and perceptions about proper use and the appropriate counseling of OTC medications. Practice expresses how the participants reported their behaviors toward OTC medications,

including frequency of giving advice to patients, number of times the participants seek information about the existing prescription of the patients to look for any existing interactions, and frequency of considering particular patient factors before recommending OTC medications. The aim of the study was to examine the knowledge, attitudes, and practices of Erbil pharmacists toward OTC medications.

Methods

Study Design and setting

A descriptive cross-sectional study was carried out in Erbil City's community and hospital pharmacies from 1st November 2024 to 31st January 2025, to assess pharmacists' attitudes, behaviors, and understanding of OTC drugs.

Participants

The inclusion criteria were licensed pharmacists who had at least one year of experience in the field in settings like community and hospital pharmacies. The exclusion criteria were pharmacists with experience only in marketing, pharmaceutical companies, those regarded as trainees, or other positions not related to patients. Convenience sampling was the method used. This non-probability method of sampling was used due to time limitations and the feasibility of administering questionnaires directly to approachable pharmacists, making probability methods impractical for this study.

Variables and scoring

Pharmacists' self-reported knowledge, attitudes, and practices on OTC medications were the main purpose of the study. The self-reported knowledge questions focused on training, upgrading their knowledge, and information about OTC medications, and pharmacist responsibility was represented in attitudes. Practice included appropriate behavior when administering medication, and counseling patients. The sociodemographic factors that were analyzed included age, gender, years of experience, education level, type of pharmacy, and number of hours worked weekly. Classifying knowledge into categories (poor, moderate, and good) based on percentiles of total knowledge scores. This classification depended on both raw scores and percentile threshold. We used fixed percentile cutoffs: below the 25th percentile as poor, 25th-75th percentiles as moderate, and above the 75th percentile as good. Ultimately, a binary strategy was employed, combining moderate and poor knowledge to create inadequate knowledge. In keeping with earlier KAP research for both explanatory precision and analytical accuracy. Attitude and practice were measured using the median of the total attitude and practice score, respectively.

Data source

A structured, self-administered questionnaire was created with

guidance from previous studies. The questionnaire was validated to ensure consistency, and transparency with the objectives of the study by experts in the field. The survey inquired about practice, knowledge, attitude, and demographics.

Population size

A population of 1,770 pharmacists served as the basis for estimating the study's sample size. To ensure a sufficient evaluation of knowledge, attitude, and practice (KAP) representation among pharmacists in Erbil City, an estimated sample size of 316 participants was calculated, taking into account a 50% projected frequency, a 5% margin of error, and a 95% confidence range. To accommodate for non-respondents, the sample size has been increased to 350 people. The goal of this modification is to ensure that the study maintains both sample representativeness and acceptable statistical power.

Statistical analysis

Statistical Package for the Social Sciences (SPSS, Version 26) was used for data entry and analysis. Two approaches were employed: descriptive statistics were used to calculate the mean \pm standard deviation (SD) for continuous variables, and frequencies and percentages for categorical variables. In the second analytic approach, the chi-square test was used to assess associations between

categorical variables. P-value ≤ 0.05 regarded as a statistically significant.

Ethical consideration

Every participant that was chosen for the research gave their informed consent. We assured each participant that their information would be kept secret and utilized exclusively for research purposes in order to maintain confidentiality and anonymity. To protect individual identity, we anonymized and securely stored all of the data, and the results were presented in aggregate form. The study was authorized by the Hawler Medical University College of Pharmacy's ethics committee.

Results

Participants' characteristics

Three hundred and fifty pharmacists were enrolled in the study, and their average age and SD was 30.15 ± 6.231 years, most of the participants were between 25 and 29 years old (39.7%). 188 (53.7%) of the 350 participants were women, and 162 (46.3%) were men. 9.1% of them had postgraduate degrees (master's and PhD), whereas the majority (90.9%) had bachelor's degrees. 7.05 ± 5.772 years was the average number of years of experience, most of the participants had less than 5 years of experience. It was found that 64.9% of pharmacists reported experience in community pharmacies, followed by hospital pharmacies (15.4%), and both (19.7%).

Most of the pharmacist had experience weekly. The key sociodemographic characteristics are shown in Table 1.

Table 1. Characteristics of the Pharmacist's sociodemographic characteristics

Demographic characteristics	No.	(%)
Age (years)	30.15 ± 6.231	
Less than 25 years old	73	20.9
25-29 years old	139	39.7
30-39 years old	110	31.4
40-49 years old	19	5.4
50 years old and more	9	2.6
Gender		
Male	162	(46.3)
Female	188	(53.7)
Level of education		
Bachelor degree	318	(90.9)
Master degree	28	(8)
Doctorate degree	4	(1.1)
Year of experience	7.05 ± 5.772	
Less than 5 years	194	55.4
5-9 years	66	18.9
10-14 years	52	14.9
15-19 years	24	6.9
20-24 years	6	1.7
25 years and more	8	2.3
Pharmacy type		
Community pharmacy	227	(64.9)
Hospital pharmacy	54	(15.4)
Both (community and hospital pharmacy)	69	(19.7)
Work hour per week		
Less than 20 hours	65	(18.6)
(20-30) hours	119	(34)
(31-40) hours	98	(28)
(41-50) hours	52	(14.9)
More than 50 hours	16	(4.6)

Distribution of KAP scores among participants

For descriptive analysis, knowledge was categorized into three levels using percentiles, and for inferential analysis, a binary strategy was used to combine moderate and bad levels. Good knowledge (scores 39 and more) was possessed by 34 percent of pharmacists, followed by intermediate knowledge (scores 35-38) by 39.1% and poor knowledge (scores up to 34) by 26.9%. A binary approach was used for both attitude and practice. The median score of attitude was 16 and 13 was median practice score. Positive values of attitude and practice were defined as

46.3% and 49.1%, respectively. The proportions of unfavorable attitudes and behaviors were 53.7% and 50.9%, respectively. Mean and standard deviation of total knowledge, attitude, and practice score presented in Table 2.

Frequency and percentage of inadequate and adequate knowledge of pharmacists about different domains of OTC drugs.

191 (54.6%) of pharmacists had insufficient knowledge on guidelines of OTC medications, followed by information about legal implications 168 (48%), classifications 160 (45.7%), and potential risks 158 (45.1%), as shown in Table 3.

Table 2. Summary of the knowledge, attitudes, and practices of pharmacists about over-the-counter medications

KAP domain	Good / Positive No. (%)	Moderate No. (%)	Poor / Negative No. (%)	Inadequate (Moderate + Poor) for knowledge No. (%)	Mean ± SD
Knowledge	119 (34)	137 (39.1)	94 (26.9)	231 (66)	36.7 ± 4.31
Attitude	162 (46.3)	-	188 (53.7)	188 (53.7)	16.73 ± 4.84
Practice	172 (49.1)	-	178 (50.9)	178 (50.9)	14.14 ± 4.62

Table 3. The frequency and proportion of pharmacists' insufficient and sufficient understanding of several OTC medication domains

Rating of knowledge on OTC medications	Inadequate knowledge No. (%)	Adequate knowledge No. (%)
On classifications	160 (45.7)	190 (54.3)
On guidelines	191 (54.6)	159 (45.4)
On potential risks	158 (45.1)	192 (54.9)
On Legal implications	168 (48)	182 (52)

Proportion of inadequate pharmacists knowledge toward different aspects of OTC medications (n=350)

The current study showed that the guidelines had the highest percentage of inadequate knowledge (54.6%), followed by legal implications (48%), OTC categorization (45.7%), potential risks (45.1%), as illustrated in Figure 1.

Proportions of training participation of pharmacists in the past year

The present study showed that 72% of the pharmacists didn't participate in any training in the past 12 months (Figure 2).

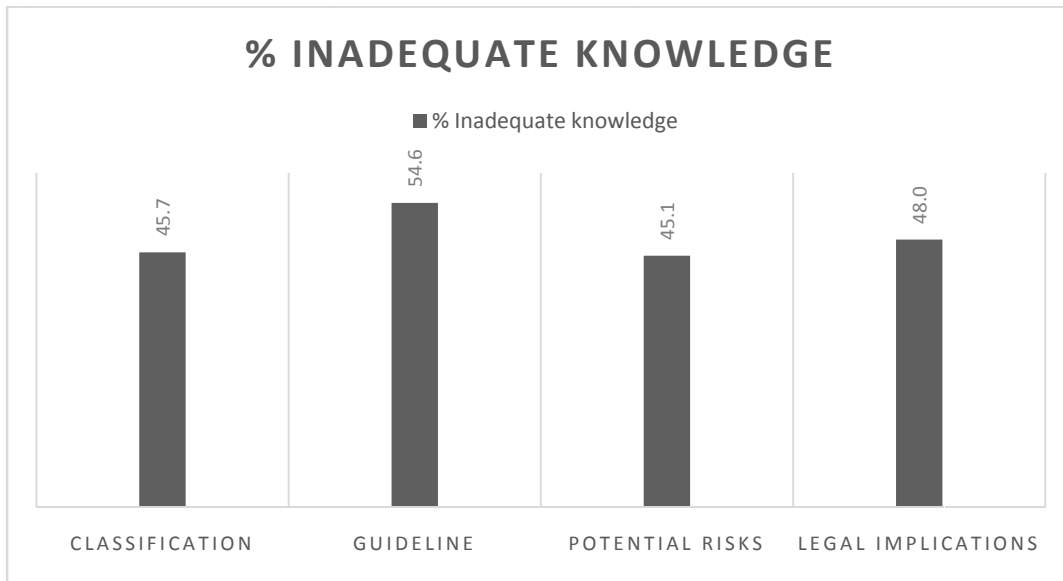


Figure 1. Percentage of inadequate knowledge of different OTC medication aspects

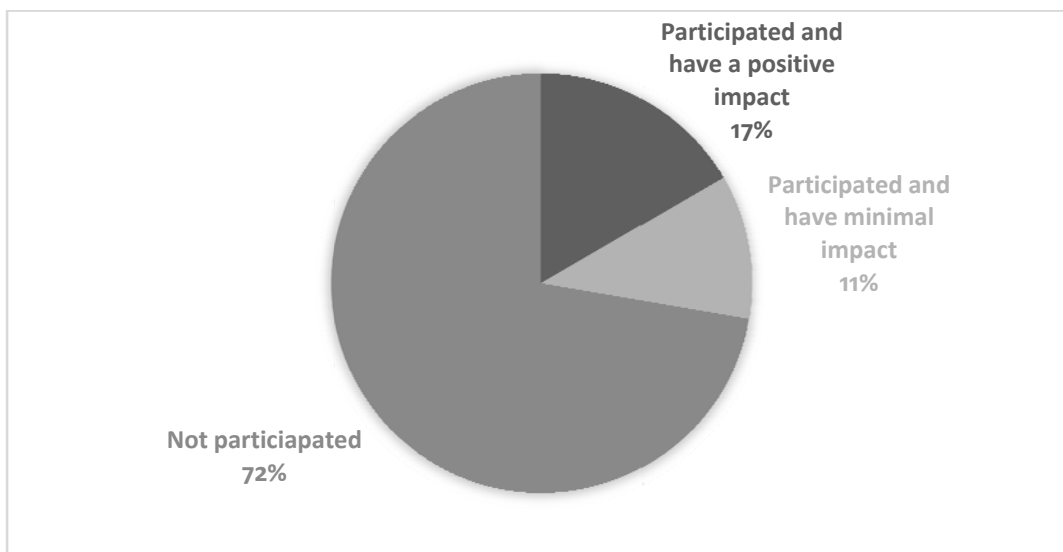


Figure 2. Percentage of pharmacists participated in trainings last year

Association between sociodemographic characteristics and KAP

As indicated in Table 4, we looked for associations between KAP scores and the following sociodemographic factors: age, gender, education level, years of experience, pharmacy type (community or hospital pharmacy), current employment status (full-time, part-time, or self-employed), current work setting (rural or urban), and weekly working hours. Attitudes differed

greatly between age groups, as seen by the statistically significant link between age and attitude level ($P = 0.05$). Positive attitude was highest among age of 30-39 years old (56; 50.9%), then followed by less than 25 years old, 40-49 years old, 25-29 years old, with frequency and percentage of (36; 49.3%), (9; 47.4%), and (61; 43.9%), respectively. Apart from that, KAP and Sociodemographic factors did not significantly relate with one another.

Table 4. Association between certain demographics with knowledge, attitudes, and practices about OTC medications

Variable	Knowledge (P-value)	Attitude (P-value)	Practice (P-value)
Age	0.214	0.05	0.161
Gender	0.695	0.67	0.347
Level of education	0.838	0.156	0.167
Year of experience	0.552	0.465	0.144
Type of pharmacy	0.473	0.664	0.989
Current employment status	0.527	0.752	0.434
Current work setting	0.248	0.986	0.079
Working hours per week	0.334	0.422	0.613

Association between knowledge and attitude level

A statistically significant correlation was found between attitude level and knowledge ($P = 0.038$). Higher knowledge levels are related with more positive attitudes (Table 5).

Association between knowledge and practice level

There was a statistically significant association between practice and knowledge ($P = 0.014$). Higher levels of good practices are associated with greater knowledge (Table 6).

Table 5. P-values for relationships between knowledge and attitude

Knowledge level	Attitude level		Total	P-value
	Negative	Positive		
	No. (%)	No. (%)		
Poor	50 (53.2)	44 (46.8)	94 (100)	0.038
Moderate	84 (61.3)	53 (38.7)	137 (100)	
Good	54 (45.4)	65 (54.6)	119 (100)	
Total	188 (53.7)	162 (46.3)	350 (100)	

Table 6. Association of knowledge with practice level

Practice level	Knowledge level			Total	P-value
	Poor	Moderate	Good		
	No. (%)	No. (%)	No. (%)		
Poor	50 (28.1)	80 (44.9)	48 (27)	178 (100)	0.014
Good	44 (25.6)	57 (33.1)	71 (41.3)	172 (100)	
Total	94 (26.9)	137 (39.1)	119 (34)	350 (100)	

Association between attitude and practice level

A statistically significant correlation between attitude and practice level is shown in Table 7 ($P = 0.001$). Better practice was associated with a higher level of positive attitude.

Discussion

Knowledge

The goal of our study was to examine pharmacists' attitudes, knowledge, and practice about OTC medications. There is a significant knowledge gap about OTC medications among pharmacists, as only 34% of them showed adequate knowledge. With only 28% of pharmacists attending OTC medication-specific training in the past year. The low participation rate in continuing education programs (CEPs) can help to explain the discovered knowledge gaps. Pharmacists must receive ongoing training and education in order to stay current on all pertinent information and ready to answer any questions that may come up (12). The results of the current knowledge assessment are consistent with a previous study on OTC medications conducted among Erbil

City pharmacy staff (9). According to the earlier study, just 25% of the staff of the pharmacies possessed sufficient knowledge. Only 46.2% of pharmacists had a good knowledge (9). A number of variables, such as a lack of chances for ongoing professional development, inadequate legal control of OTC activities, and a lack of focus on pharmacists' involvement in patient education, may be responsible for this reduction from the previous study to the present study in Erbil. On the other hand, a cross-sectional survey of community pharmacists in Egypt revealed that almost 80% of them knew moderately to well about the negative effects of OTC NSAIDs; this could be because more of them were able to access in continuing education in the field (13). Similarly, a study in Qatar revealed that 90% of community pharmacists knew a good to great knowledge about the gastrointestinal and renal risks of NSAIDs (14). In contrast, the level of good knowledge among community pharmacists in a study conducted in India as an international study was a 55.35% knowledge score of Indian community pharmacists (15).

Table 7. Association of attitude with practice level

Practice level	Attitude level		Total No. (%)	P-value
	Negative No. (%)	Positive No. (%)		
Poor	111 (62.4)	67 (37.6)	178 (100)	0.001
Good	77 (44.8)	95 (55.2)	172 (100)	
Total	188 (53.7)	162 (46.3)	350 (100)	

The level of good knowledge was still low, but higher than the present study. In our study, no statistically significant association found between sociodemographic characteristics and knowledge of pharmacists. This consistent with another study conducted in Qatar among community pharmacists (14).

Attitude

In the present study, the percentage of pharmacists with a positive attitude was 46.3%. Contrary to what we found, the study of community pharmacists in Qatar revealed that most of the participants were in favor of patient education regarding the harmful effects of over-the-counter NSAIDs (14). The percentage of positive attitude is also significantly higher (71.6%) in an Indian study than it was in our survey (16). Age and attitude level were found to be statistically significantly related ($P = 0.05$). Participants between the ages 30 and 39 had the most favorable attitudes. Pharmacists between the ages of 30 and 39 might exhibit a more professional demeanor, which could be explained by factors including job stability, confidence, exposure to more clinical situations, and growing patient counseling duties. Other sociodemographic characteristics are not associated significantly with attitude. This finding largely aligns with the recent study conducted among community pharmacists in India, which discovered a statistically significant

correlation ($P < 0.05$) between age and attitude toward OTC medications; the study also found a significant association between education and attitude level. This supports the idea that becoming older can result in a more positive outlook because of greater maturity and work experience (15).

Practice

In the present study, the percentage of pharmacists with a good practice was 49.1%. Lack of training may be the cause of the reported low level of good practice, which could directly affect pharmacists' ability to appropriately counsel patients on the use of OTC medications. Practice level was higher than that of a study that looked at the self-medication habits of pharmacy professionals, such as pharmacists and pharmacist assistants, in Duhok, Iraq. The overall mean score for good practice, which was based on problem-solving, counseling, and communication, was 35.1% as long as OTC drugs continue to be the main source of self-medication (17). This difference is probably linked to the educational level of participants, as the Duhok study enrolled both pharmacists and pharmacist assistants, while the current study only recruited pharmacists. A recent cross-sectional study on pharmacists' behaviors regarding drugs was carried out in Sulaimani, Iraq. The percentage of counseling was only 34%, the investigation uncovered

inadequate counseling and dispensing practices (18). Compared to the recent study conducted among community pharmacists in India, the mean good practice level was higher than our finding (67.04%). The higher practice level may be linked to a higher presence of ongoing educational programs, regulation implementation, or higher involvement in patient education (15). Sociodemographic characteristics and practice level was not found to be statistically related ($P > 0.05$). This result is consistent with a prior study conducted in Malaysia that found no statistically significant relation ($P > 0.05$) between sociodemographic factors and practice of undergraduate health students toward OTC drugs (19).

Associations between KAP domains

Statistically significant associations were found between knowledge and attitude ($P = 0.038$), knowledge and practice ($P = 0.014$), and attitude and practice ($P = 0.001$). This result is consistent with the recent study conducted in Egypt among community pharmacists toward OTC drugs, where there was a statistically significant association observed among KAP domains (13).

Conclusion

According to the findings, pharmacists' knowledge, attitudes, and practice toward OTC drugs were inadequate. Additional training is necessary to improve KAP toward OTC drugs. A statistically significant relation was

found between attitude level and age, as well as between KAP domains, which were positively related with each other. Although there was no significant relation between other sociodemographic indicators and KAP, other factors, like the observed low level of training involvement, might have affected pharmacist KAP. Future research ought to look into additional factors affecting pharmacists' KAP toward OTC drugs.

Limitations

Among the study's limitations is its cross-sectional approach, which gathers data all at once and only identifies relationships rather than casual correlations. Another limitation was the application of self-administered perception-based questionnaires; this type of question may lead to bias (20). The results of the study conducted in Erbil City are unique to that region and cannot be applied to pharmacists outside of the city. Convenience sampling was utilized in the study, which might not accurately represent the pharmacist community as a whole.

Competing interest

The authors declare that they have no competing interests.

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