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Community Pharmacists' Knowledge, Attitudes, and Practices Towards the Adulteration of Herbal Medicines

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Abstract

Background: Herbal medicines are the cornerstone of folk medicine. Pharmacists are often the primary first line of care in community settings. They can play a vital role by providing information and supplying genuine herbal medicines (HMs) and dietary supplements (DSs). Evidence-based data on pharmacist's awareness of and views on adulterated medicines in developing nations is limited. **Aims:** This study aims to explore the knowledge, attitudes, and practices of Iraqi community pharmacists towards adulterated HMs sold in community pharmacies. **Methods:** a cross-sectional web survey with a convenient sample of Iraqi community pharmacists between the 3rd of January and the 13th of February 2024, using a validated questionnaire. **Results:** A total of 408 pharmacists participated in this study. 63.5%, 54.2%, and 64.46% have adequate knowledge, an intense attitude in a positive direction, and appropriate practices toward the adulteration of HMs and DSs, respectively. A significant correlation was found between knowledge, attitude, and practice. Male participants were found to have higher knowledge scores than females, but female participants were found to have more appropriate practice than males. **Conclusion:** The study findings revealed that a large proportion of the Iraqi community pharmacists had adequate knowledge, an intense attitude in the positive direction, and appropriate practice towards adulteration of HMs and DSs.

1. Introduction

In Iraq and the Middle East, herbal medicines (HMs) are the cornerstone of folk medicine. It has been estimated that 43 - 76% of the population in these countries have used HMs (1-4). Herbal medicines users have the perception that these medicines are natural, free of adverse effects, and more effective than conventional medicines. In contrast to this perception, studies have proven that HMs are associated with mild to severe adverse effects, especially if they are used for long periods in high doses. Furthermore, people may not disclose their use of HM during a physician's visit, which may lead to herbal-drug interactions (5-8).

In contrast to conventional medicines that undergo rigorous premarketing quality control tests for efficacy and safety, dietary supplements (DSs) are marketed without pre-marketing approval, since it is the manufacturers' responsibility to ensure the safety of their product (9). This Act also allowed HMs and DSs to be sold in herb shops, supermarkets, and pharmacies (10).

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The lucrative nature of HMs and DSs, the increased trend of utilization of these products, and the lack of regulations that govern their marketing opened the doors to fraudulent manufacturers to produce adulterated versions of HMs and DSs. In the context of HMs and DSs, is the intentional substitution and/or addition of herbal, pharmaceutical, or chemical ingredients undisclosed in the label, either to increase the efficacy or to generate higher revenues (11).

Adulteration of herbal and DSs has expanded significantly, posing a serious risk to both the public's health as well as the pharmaceutical industry (12). According to various estimations, the annual value of the counterfeit and adulteration of herbal and conventional medicines in the market range from $35 to $44 billion (13). In Iraq, the latest reports estimated that more than two-thirds of conventional medicines sold in the private sector (community pharmacies) are falsified (14, 15). One possible way to reduce the negative impacts of adulterated DS usage is by enhancing the educational role of healthcare professionals (HCPs). Studies showed that HCPs' knowledge and opinions play an important role in reducing the number of adulterated HMs and dietary products that are distributed throughout the country (16-18). The aim of this study is to evaluate Iraqi community pharmacists' knowledge, attitude, and practice towards adulteration.

2. Methods

This was a cross-sectional survey among Iraqi community pharmacists to explore their knowledge, attitude, and practice towards adulteration. A web survey was used to collect data from pharmacists from different provinces and to collect as many responses as possible. A convenience sampling method was employed, in which graduated Iraqi pharmacists who were registered members of the Syndicate of Iraqi Pharmacists were invited via sending the survey link to the closed group of the Syndicate of Iraqi Pharmacists on Facebook. The invitation letter containing the survey link was sent on the 3rd of January, 2024, and a reminder was sent on the 17th of January. The data collection continued until the 13th of February 2024. This study was approved by the Scientific Committee at the College of Pharmacy, University of Mosul.

A structured questionnaire was developed based on a literature review of relevant studies to explore the community pharmacists' knowledge, attitudes, and practices toward the adulteration of HMs and DSs. Permission was sought from the authors of Conway et al., 2023 study to use their questionnaire, which was modified according to the aims of this study and the cultural differences between the two settings (19). The questionnaire was translated into Arabic through forward translation authors to generate a conceptual version as close as possible to the initial questionnaire and to increase the response rate. Then, the translated version was back-translated to English by an independent translator from the College of Medicine. Both English and Arabic versions were piloted before the start of the study. Both versions were included in the online survey, and the participants were free to use any preferred language. The survey started with a brief introduction summarizing the study's aims and asking for the participants' voluntary participation and consent to participate. The questionnaire consisted of four domains. The first domain was asking about the participants' demographic characteristics.

The second domain explored the knowledge of adulteration of HMs and DSs and consisted of 11 multiple-choice questions. The score of this domain ranges from 0 - 22. A higher score in this domain indicates better knowledge of the participants. The third domain explored the participants' attitude towards adulteration and consisted of 11 five-point Likert questions (ranging from Strongly agree to strongly disagree). The score of this domain ranges from 11- 55. A higher score in this domain reflects a more positive attitude against adulteration. The fourth domain determined the participants' practice towards adulteration of HMs and DSs and consisted of 7 multiple-choice questions. The score of this domain ranges from 0 - 14. A higher score in this domain is indicative of good practices that potentially reduce the risk of dispensing adulterated products.

The modified questionnaire was validated via face validation and reliability tests. During the face validity, the questionnaire was sent to 12 experts in Clinical Pharmacy at the University of Mosul, the University of Baghdad, and the University of Duhok. The wording of questions 6, 9, 11, 12, and 24 were amended according to their comments and recommendations. The revised survey questionnaire was piloted to 12 experts using the Google Forms platform in its final online format. Piloting revealed overall survey usability and an average completion time of 10 -15 minutes.

2.1. Statistical analysis

The retrieved survey data were cleaned and coded using Microsoft Excel 2021. Descriptive and inferential statistical analyses were performed using STATA MP Version 13. The survey results were presented as frequency, percentages, means, and standard deviation for categorical and continuous data. The median split method was used to categorize the knowledge, attitude, and practice levels. In which the median value of the knowledge, attitude or practice was determined separately for the entire sample and used as a cutoff point. Participants with scores below the median were classified as inadequate knowledge, negative attitude, or inappropriate practice while those at or above the median were categorized as adequate knowledge, positive attitude, or appropriate practice, respectively. The Spearman correlation coefficient was used to identify the relationships between the scores. Kolmogorov-Smirnov (K-S) test was used to test the normality of data distribution. Kruskal Wallis test and

Mann-Whitney test were used to find the difference in the mean knowledge, attitude, and practice scores with the demographic characteristics of the participants. A p-value < 0.05 was considered as significant.

3. Results

3.1. Psychometric Properties of the Questionnaire

The internal consistency of the questionnaire was assessed using Cronbach's alpha coefficient. The overall Cronbach's alpha for the questionnaire was 0.747, indicating satisfactory reliability. The subscales for knowledge, attitude, and practice demonstrated acceptable internal consistency with Cronbach's alpha values of 0.706, 0.831, and 0.731, respectively.

3.2. Socio-demographic characteristics of the participants

A total of 408 pharmacists participated in this study, of whom 64% were females. The mean age of participating pharmacists was (32.30±7.52) years. The majority (79.2%) of participating pharmacists were working in the city center. They were from different educational levels, and the majority (82.6%) of participating pharmacists had bachelor's degrees, with mean years of experience of about (8.32±6.72). A minority (17.2%) of the participating pharmacists were letting the pharmacy technicians request medicines for their pharmacies. The results of the K-S test for all of the continuous variables were significant, indicating that they are non-normally distributed (**Tables 1 and 2**).

Table 1. Descriptive results of the study participants' (continuous) demographic characteristics

Variables	Mean	Median	Std. Deviation	K-S*
Age	32.30	30.00	7.52	0.001
Years of experience	8.32	6.00	6.72	0.001

** Kolmogorov-Smirnov test: A significant result indicates non-normality.*

Table 2. Socio-demographic (categorical) characteristics of the study participants

Variables	Frequency	Percent%
Gender		
Male	147	36.0
Female	261	64.0
Area of Practice		
City center	323	79.2
City out outskirts	46	11.3
Countryside	39	9.6
Educational level		
Bachelor	337	82.6
Master	58	14.2
PhD	13	3.2
Responsibility for requesting medicines inside the pharmacy		
I do request myself	169	41.4
My colleague	169	41.4
The technician does request	70	17.2

3.3. Knowledge about adulteration

More than one-half of the participating pharmacists (57%) knew that adulterated HMs and DSs are products that do not contain the ingredients listed on the label and contain undisclosed pharmaceuticals or chemical substances. About half of them (49.3%) believed that the most reliable sources of information about the adulteration of HMs and DSs were the Syndicate of Iraqi Pharmacists or the Ministry of Health and national and international organizations such as the FDA. Half of pharmacists (55.9%) thought that the potential problems associated with adulterated HMs and DSs in the market are efficacy and safety problems. Only 40% of all pharmacists have thought that manufacturers could adulterate HMs and DSs by mixing them with drugs or illegal or prohibited substances or containing no herbal or natural substances. Furthermore, more than one-half (55.6%) of participating pharmacists knew that the FDA regulates HMs and DSs as supplements. On the other hand, only 15.2% of the participating pharmacists knew that Iraq has a law against adulteration, and only 23.8% thought that pharmacists couldn't detect adulteration of HMs and DSs inside their pharmacies. About two-thirds (60.5%) of the participating

pharmacists thought that adulteration of HMs and DSs could be limited by actively reporting these products to the Syndicate of Iraqi Pharmacists and pharmacovigilance centers and increasing community awareness about adulteration.

Among the most commonly adulterated in pharmacies, more than one-half (54.2%) of the participating pharmacists stated that cyproheptadine and dexamethasone are the most common adulterants that are expected to be found in herbal weight gain medicines. Only one quart (24%) of participating pharmacists thought that sibutramine and thyroxine are the most common adulterants that are expected to be found in herbal weight-loss medicines. About half (47.3%) of them mentioned that sildenafil and tadalafil are the most common adulterants that are expected to be found in herbal sexual enhancement medicines. Overall, about two-thirds (63.5%) of the participating pharmacists had adequate knowledge about the adulteration of HMs and DSs (**Table 3**).

Table 3. Descriptive statistics of the participants' knowledge

Variables	Frequency (n)	Percentage (%)	Mean ± SD	Median
Total knowledge	408	100	12.34 ±2.74	12.00
Inadequate knowledge	149	36.5	9.45 ±1.70	10.00
Adequate knowledge	259	63.5	14.01±1.61	14.00

3.4. Attitudes towards adulteration

Of all participating pharmacists, about one quart of them think that they had not received enough education about HMs and DSs during their formal education. About one quart (26.7%) of the participating pharmacists did not trust the labels placed on the packages of HMs and DSs. Similarly, about one-half (46.3%, 67%, and 56.2%) of participating pharmacists had an intense attitude in the negative direction regarding the reason for prescribing HMs and DSs that they are safer, more effective, or cheaper than conventional medicines, respectively. In contrast, more than one-half (54.7%) of them think that they are prescribed because they are associated with more profit for the physicians and pharmacists. Most (86.5%) participating pharmacists agreed that HMs and DSs are widely available in Iraqi markets.

On the other hand, about one-half (48.8%) of the participating pharmacists agreed that the community pharmacists who dispense adulterated HMs and DSs are the major ones responsible for any adverse reactions that can occur and two-thirds (67.2%) of the participating pharmacists agreed that an individual action taken by community pharmacists can prevent the availability of adulterated HMs and DSs in the markets. However, about one-half (46.3%) of the participating pharmacists disagreed that the actions taken by the Ministry of Health against adulterated HMs and DSs are strong enough to stop drug stores from selling adulterated products. At the same time, three-quarters (75.5%) of the participating pharmacists thought that continuous educational programs for pharmacists could provide enough knowledge to prevent dispensing adulterated HMs and DSs. Overall, more than one-half (54.2%) of the participating pharmacists have an intense attitude in a positive direction about the adulteration of HMs and DSs (**Table 4**).

Table 4. Descriptive statistics of the participants' attitude

	Frequency (n)	Percentage (%)	Mean ± SD	Median
Total attitude	408	100	31.32 ±4.05	31
Negative attitude	187	45.8	27.49 ±2.19	28
Positive attitude	221	54.2	33.98 ±2.68	33

3.5. Practices towards adulteration

About one-half (48.3%) of participating pharmacists stated that the ingredients and indications printed on the product package, in addition to the origin, brand, and company of HMs and DSs, would make them suspect that the product is adulterated. To avoid requesting adulterated products, about two-thirds (68.4%) of the participating pharmacists stated that they would select products that are from well-known brands and origins and certified by the Ministry of Health.

When the participating pharmacists were asked if they suspected or discovered that they had adulterated products in their pharmacies, most participating pharmacists (85.5% and 84.6%) mentioned that they would directly throw them away or return them to the drugstore, respectively.

However, three-quarters (74.8%) of the participating pharmacists said that they might suspect that a dispensed product is adulterated when the patients complained of non-documented adverse reactions or inefficacy.

On the other hand, in the case of unavailability of the genuine HMs and DSs that have been prescribed for the patient or the patient has been prescribed a known adulterated product, the majority (82% and 64.7%) of the participating pharmacists stated that they would either refuse to dispense the adulterated version or at least telling the patient that the dispensed product is adulterated, respectively. Overall, about two-thirds (64.46%) of the participating pharmacists were considered to have appropriate practice toward the adulteration of HMs and DSs (**Table 5**).

Table 5. Descriptive statistics of the participants' practice

Variables	Frequency (n)	Percentage (%)	Mean ± SD	Median
Total practice	408	100	11.73 ± 2.01	12
Inappropriate practice	145	35.54	9.65 ± 1.91	10
Appropriate practice	263	64.46	12.87 ± 0.75	13

3.6. The association between the knowledge, attitude, and practice scores of the participants and the demographic characteristics of the participants

Table 6 shows no significant correlation between knowledge, attitude, and practice with age and years of experience. In contrast, a significant correlation was found between knowledge, attitude, and practice, in which the increase in knowledge was associated with an increase in attitude and practice (**Table 7**).

The differences between knowledge scores and gender, area of practice, educational level, and responsibility for requesting medicines inside the pharmacy were examined, and a significant difference was found in gender (p-value = 0.046). Regarding attitude, a statistically significant difference was found with area of practice (p-value = 0.029). Similar to knowledge, the difference between practice scores and the gender, area of practice, educational level, and responsibility for requesting medicines inside the pharmacy were examined, and a significant difference was found with gender (p-value = 0.048) (**Table 8**).

Table 6. The correlation between continuous demographic characteristics and knowledge, attitude, and practice of the participants

		Knowledge		Attitude		Practice	
Variables	N	Rho*	P – value	Rho*	P – value	Rho*	P – value
Age	408	0.009	0.860	-0.028	0.570	0.031	0.532
Years of Experience	408	-0.020	0.684	0.034	0.499	-0.031	0.526

** Spearman's correlation*

Table 7. The Correlation between knowledge, attitude, and practice

Variables	N	Rho*	P-value
Knowledge and Attitude	408	0.225	0.000
Knowledge and Practice	408	0.298	0.000
Attitude and Practice	408	0.185	0.000

** Spearman's correlation*

Table 1. The differences between demographic characteristics and knowledge, attitude, and practice

	Knowledge			Attitude			Practice		
Variables	Mean ±SD	Median	P-value	Mean ±SD	Median	P-value	Mean ±SD	Median	P-value
Gender*									
Male	12.63 (2.95)	13	0.048	38.36 (1.33)	38	0.213	11.38 (2.30)	12	0.046
Female	12.18 (2.61)	12		37.88 (1.44)	38		11.92 (1.79)	12	
Area of Practice**									
City center	12.37 (2.66)	12	0.970	38.27 (3.13)	38	0.029	11.80 (1.96)	12	0.258
City out outskirts	12.19 (3.18)	13		37.69 (1.56)	37		11.10 (2.50)	12	
Countryside	12.30 (2.89)	39		36.66 (1.94)	37		11.84 (1.59)	12	
Educational Level**									

Bachelor	12.38 (2.69)	13	0.739	38.09 (2.78)	38	0.879	11.71 (1.99)	12	0.886
Master	12.10 (2.83)	12		37.81 (5.22)	38		11.75 (2.19)	12	
PhD	12.38 (3.84)	12		38.15 (3.11)	37		11.92 (1.44)	13	
Responsibility for requesting medicines inside the pharmacy **									
I do request myself	12.54 (2.95)	13	0.346	38.47 (1.27)	38	0.072	11.62 (2.16)	12	0.953
My colleague	12.18 (2.62)	12		37.70 (1.19)	37		11.77 (1.89)	12	
The technician does request	12.36 (2.70)	12		37.72 (1.29)	38		11.83 (1.87)	12	

** Mann Whitney U test, ** Kruskal Wallis Test*

4. Discussion

The results of the current study found that the participating pharmacists have adequate knowledge, an intense attitude in the positive direction, and appropriate practice toward adulteration of HMs and DSs.

4.1. Pharmacists' Knowledge of Adulteration

The majority of participating pharmacists (57%) demonstrated adequate knowledge of adulteration in HMs and DSs. A similar result was found in a recent Iraqi study (20). This understanding encompassed the presence of undisclosed pharmaceutical or chemical substances within these products. However, only 15.2% were aware of the specific Iraqi law against adulteration, highlighting a potential gap in regulatory knowledge. Regarding information sources, pharmacists primarily relied on the Ministry of Health, the Syndicate of Iraqi Pharmacists, and international organizations like the FDA and the European Medicine Agency (EMA). This indicates a reliance on official channels for information. In contrast, a similar study in Ethiopia highlighted the reliance of a similar percentage on media as a source of information (21). Approximately half of the participants (49.3%) identified efficacy and safety concerns as the primary risks associated with adulterated HMs and DSs. This awareness is crucial in mitigating potential harm to consumers. This result was consistent with Mehralian et al.'s (2014) and Ng et al.'s (2021) studies which found that the efficacy and safety of HMs are the main concerns of pharmacists regarding adulterated products (22, 23). Additionally, over half (55.6%) recognized the FDA's regulatory role in overseeing HMs. In terms of identifying adulterated products, pharmacists primarily relied on product labels, ingredients, and brand reputation. However, only 23.8% believed they could reliably detect adulteration within their pharmacies, suggesting a potential limitation in practical skills.

4.2. Pharmacists' Attitudes Towards Adulteration

Pharmacists exhibited a predominantly positive attitude against the adulteration of HMs and DSs. Over half of the participants expressed distrust in product labels, highlighting concerns about the accuracy of ingredient information. Additionally, a significant proportion (46.3%) believed that HMs and DSs were often prescribed inappropriately for financial gain, indicating a critical stance towards the industry. The findings could be attributed to the impact of legal or illegal marketing campaigns to persuade physicians and pharmacists to increase the utilization of these products. A similar result was demonstrated in Siraj et al.'s (2022) study (21).
Regarding the role of pharmacists, while a majority recognized their responsibility in preventing the distribution of adulterated products, there was also a perception that regulatory bodies should take the lead. This suggests a need for a collaborative approach to address the issue. This result could be influenced by the Iraqi Penal Code, Article 227, which states that "the intentionally dispensing, selling, or marketing of adulterated, falsified, counterfeit, or expired medicines is a crime that necessitates a punishment with imprisonment for 6-12 months and imposing a fine not exceeding one million Iraqi dinars". Similarly, the Syndicate of Iraqi Pharmacists according to the Iraqi Pharmacy Law, Article 33, stated that "a fine not exceeding five million Iraqi dinars, suspension of the pharmacy license for a period not exceeding one year, and revocation of the pharmacy license in case of repeated violations". Furthermore, pharmacists demonstrated a desire for increased education and training related to HMs and DSs and adulteration, indicating a recognition of knowledge gaps in this area. Similarly, recent studies found that pharmacists' and HCPs' attitudes could support governmental regulations and laws against adulteration (24, 25).

4.3. Pharmacists' Practices Towards Adulteration

Pharmacists demonstrated a reasonable level of awareness regarding potential practices to mitigate the risks associated with adulterated HMs and DSs. A majority (85.5%) indicated that they would discard suspected adulterated products, while 84.6% would return them to the supplier. This suggests a commitment to patient safety. However, the ability to detect adulterated products was limited. Heinrich et al.'s (2017) study stated that pharmacists providing HMs should have a professional responsibility to ensure that HMs stocks are from a reputable source, offer advice only if they have suitable training, and recommend remedies only if they are confident of their safety and quality (26).
While over half (54.2%) relied on product labels, ingredients, and brand reputation to identify potential issues, only 23.8% believed they could confidently detect adulteration in-store. This highlights a knowledge gap in

practical product evaluation. This result was consistent with Chaudhary's (2023) study which demonstrated that the majority of respondents discriminate against adulterated products by their efficacy and labels (27).

Pharmacists also emphasized the importance of regulatory oversight and industry accountability. A significant proportion (60.5%) believed that reporting suspected cases to regulatory authorities was crucial in combating adulteration. This underscores the role of pharmacists as frontline defenders against the circulation of substandard products. It is evident that while pharmacists possess a foundational understanding of the issue, there is a need for enhanced training and resources to bolster their ability to identify and address adulterated HMs and DSs effectively. Ziance's (2008) study stated that reporting suspected or confirmed adulterated medicines by pharmacists in consultation with the medical authorities, FDA, and the manufacturer could assist in identifying, obtaining, and forwarding relevant follow-up information about these products (28). The FDA recommended that pharmacists report suspected adulterated products through MedWatch (29). Suspicious products should be removed from the dispensing area immediately until further instruction is given from the FDA or other health authorities.

4.4. Factors Influencing Pharmacists' Knowledge, Attitudes, and Practices

Demographic factors such as age, gender, and work setting showed limited influence on pharmacists' knowledge, attitudes, and practices regarding adulteration. While gender disparities were observed in knowledge and practice, these differences were not statistically significant. A notable finding was the positive correlation between knowledge, attitude, and practice. Pharmacists with higher levels of knowledge tended to exhibit more positive attitudes and appropriate practices. This suggests that educational interventions aimed at enhancing knowledge could positively impact attitudes and behaviors. This result could be attributed to the difference in the work settings of each gender, making male pharmacists more capable of managing their community pharmacies and more knowledgeable about HMs and DSs than females, who are more indulged with part-time public sector jobs. This result was not in line with Fahmy et al.'s (2010) study, which found that there was no statistically significant difference in the knowledge of the community pharmacists with the gender, age, level of education, and years of employment, except for working place which was found to be statistically significant with knowledge (30). It is expected that pharmacists working in community pharmacies would have a good knowledge of these products since they are being dispensed daily. In contrast, Zaidi et al.'s (2022) study found a statistically significant association between knowledge about HMs and gender, where Saudi female pharmacists had more knowledge than male pharmacists (31). Soltanipour et al.'s (2022) study showed no significant correlation between knowledge, age, and experience scores (32). Similarly, studies in Palestine and Jordan reported similar findings concerning the relationship between knowledge and years of experience (33, 34). The study highlighted the importance of continuous education and training for pharmacists to address the challenges posed by adulteration. Strengthening regulatory frameworks and increasing public awareness were also identified as crucial components of a comprehensive approach to combating this issue.

4.5. Implications of the Findings

The findings from this study emphasize the necessity of attention to pharmacists' role when it comes to adulteration in HMs and DSs. Awareness of adulteration among pharmacists is sufficient, though improvement in practical experience and capability to identify illegitimate HMs or DSs even exists. The study also emphasized the need for specific education interventions to upgrade and strengthen pharmacists' knowledge, operations handling concerning adulterated HMs and DSs. These programs should focus on product quality control (with an eye toward regulatory compliance) and practical skills training. The results also highlight the need for robust regulatory systems and cooperation between pharmacists, regulators and consumers to prevent adulteration. Working together, these stakeholders can help to create a safer and more trusted market for HMs and DSs.

4.6. Study Limitations

This study is associated with some limitations. First, the cross-sectional design of this work rules out any causal relationships between knowledge, attitudes and practices. Furthermore, the self-reported nature of data can introduce biases. Second, although the survey involved community pharmacists from different cities in Iraq, however, this may limit the generalizability of the results to other populations. Despite these limitations, the study provides valuable insights into pharmacists' perspectives on HMs and DSs adulteration and informs strategies for addressing this critical public health issue.

5. Conclusions

The study findings revealed that a large proportion of the study participants had adequate knowledge, an intense attitude in the positive direction, and appropriate practice towards adulteration of HMs and DSs. To improve the ability of HCPs and pharmacists to identify and report suspicious medications and prevent harm associated with adulterated medicines, awareness programs about adulterated medicines must be developed and put into place for both the general public and health-related professionals.

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7. Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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عرفة صيادلة المجتمع ومواقفهم وممارساتهم تجاه غش الأدوية العشبية

الخلاصة

الخلفية: الأدوية العشبية هي حجر الزاوية في الطب الشعبي. غالبًا ما يكون الصيادلة هم خط الرعاية الأول الأساسي في البيئات المجتمعية. يمكنهم لعب دور حيوي من خلال تقديم المعلومات وتوفير الأدوية العشبية الأصلية والمكملات الغذائية. البيانات القائمة على الأدلة حول وعي الصيادلة ووجهات نظرهم بشأن الأدوية المغشوشة في الدول النامية محدودة. **الأهداف:** تهدف هذه الدراسة إلى استكشاف معرفة ومواقف وممارسات صيادلة المجتمع العراقي تجاه الأدوية العشبية المغشوشة التي تباع في الصيدليات المجتمعية. **الطرق:** مسح ويب مقطعي مع عينة ملائمة من صيادلة المجتمع العراقي بين 3 يناير و 13 فبراير 2024، باستخدام استبيان تم التحقق من صحته. **النتائج:** شارك ما مجموعه 408 صيادلة في هذه الدراسة. 63.5٪ و 54.2٪ و 64.46٪ لديهم معرفة كافية وموقف قوي في اتجاه إيجابي وممارسات مناسبة تجاه غش الأدوية العشبية والمكملات الغذائية على التوالي. وقد وجد ارتباط كبير بين المعرفة والموقف والممارسة. ووجد أن المشاركين الذكور لديهم درجات معرفة أعلى من الإناث، ولكن وجد أن المشاركات الإناث لديهن ممارسة أكثر ملاءمة من الذكور. **الاستنتاج:** كشفت نتائج الدراسة أن نسبة كبيرة من الصيادلة المجتمعيين العراقيين لديهم معرفة كافية، وموقف مكثف في الاتجاه الإيجابي، وممارسة مناسبة تجاه غش الأدوية والعقاقير.

الكلمات المفتاحية: الغش، الأدوية العشبية، المعرفة، الموقف، الممارسة.