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Research Article:

Knowledge, Attitude, and Practice on Over-the-Counter Drugs among Pharmacy Students

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Abstract

Background: Over-the-counter (OTC) medications are commonly utilized for self-treatment due to their easy accessibility and perceived safety; however, inappropriate use can result in adverse health outcomes. As future healthcare providers, pharmacy students play a vital role in guiding the public on the responsible use of these medications. This study aims to evaluate the knowledge, attitudes, and practices of pharmacy students regarding OTC drug use, thereby assessing their readiness to promote safe self-medication practices in the community. **Methods:** A cross-sectional study was conducted involving 412 pharmacy students from a university in the Kurdistan region of Iraq. Data were gathered through a structured questionnaire distributed via Google forms. The Chi-square test was used to explore gender-related differences, while Fisher's exact test examined variations across age groups. **Results:** Among 412 participants, 241 (58.5%) were female and 171 (41.5%) were male, with a mean age of 21.91 ± 1.2 years and an average academic year of 3.28 ± 1.41 . The prevalence of self-medication with OTC drugs was notably high at 88.6%. Female students were significantly more likely to disagree with the statement that all OTC medications are safe when used alongside prescription drugs ($P < 0.01$). No significant gender differences were observed in self-medication practices. Students aged 23–25 demonstrated significantly higher awareness of paracetamol safety and toxicity ($P < 0.01$) and reported experiencing more adverse effects from OTC drug use ($P < 0.01$). **Conclusion:** The high prevalence of OTC drug use among pharmacy students underscores the need for enhanced education on this topic. While students generally exhibited moderate knowledge and responsible practices, certain misconceptions and risky behaviors persist. Senior students and females tended to be more informed. Incorporating targeted educational modules on OTC medications into pharmacy curriculum is recommended to improve awareness and ensure safer self-medication practices in the future.

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1. Introduction

Over-the-counter (OTC) medications are drugs that can be purchased in pharmacies without a prescription and are also available on the shelves of supermarkets and retail stores (1). Self-medication (SM) refers to the use of drugs, herbs, or home remedies on your own to cure self-

recognized health issues without consulting a health care professional. This practice is often driven by social and economic motivations, which are associated with the advantages of fewer physician visits and lower costs compared to prescription-only medications (POM). SM arises in all ages and groups, but its prevalence varies within individuals and regions (2). Understanding the proper use of OTC medications is crucial to avoid health consequences. SM plays an important role for pharmacy students since they are future healthcare professionals who are going to be responsible for advising patients about the gains and hazards of SM. Their broad understanding of medical issues and medications means they approach SM

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differently than the general public (3,4). Two studies among Saudi pharmacy students reported that most students there possessed good knowledge of OTC drugs. The first study showed that 62.2% had a high level of knowledge, while the second reported that 94.6% had good knowledge (5,6). Similarly, studies conducted in Ethiopia and Malaysia reported that 67.6% and 73.3% of pharmacy students, respectively, had good OTC drug knowledge (3,7). However, another study on pharmacy students in a university in Ethiopia had poor OTC drug knowledge (8). Additionally, several studies noted that upper-year students and those who had completed an OTC course demonstrated better understanding of OTC drugs (5,7,9). Furthermore, multiple studies have reported a high prevalence of SM among pharmacy students across different regions. For instance, 84.88% in Iraq, 79.7% and 72.7% in Ethiopia, 57.1% in Iran, and 91.5% in Malaysia. The most commonly reported reasons for practicing SM were quick relief, convenience, avoiding long waiting times at clinics, and treating minor illnesses. Additionally, reliance on their academic background and cost saving were also among the reasons (3,7-10). The most common conditions for which they sought SM were fever, headache, gastric pain, and abdominal cramps (3,8,9). Cold and muscle pain were also common (9). While the most commonly used drugs were painkillers such as paracetamol (3, 6, 8, 9), antibiotics (8-10), non-steroidal anti-inflammatory drugs (NSAIDs) (3), antacids (8), and antihistamines (9). Despite the numerous advantages offered by OTC medications, their inappropriate use can lead to serious health consequences. Especially in countries like Iraq and the Kurdistan region, where access to medications is often less regulated, there is a pressing need to assess pharmacy students' knowledge, attitudes, and practices (KAP) related to OTC drugs. To date, limited studies have been conducted in Iraq and the Kurdistan region focusing specifically on OTC drugs among pharmacy students. Existing research is either insufficient or focused broadly on SM. Therefore, this study is needed and aims to understand how well future pharmacists in this region are prepared to manage and educate the public on the safe use of OTC medications by assessing their KAP. Findings from this research will contribute to improving pharmacy curriculum and informing public health strategies tailored to the Iraqi and Kurdish contexts.

2. Materials and methods

2.1. Study area and period

Data for the study was gathered at Tishk International University (TIU) in Erbil, Kurdistan region, Iraq. This study was conducted at a single institution, TIU, to ensure consistency and control over variables such as curriculum structure, teaching methods, and student exposure to OTC drug topics. By focusing on one university, this can minimize external variability and ensure that differences in KAP among students could be attributed more confidently to individual factors (such as age and gender) rather than

differences in academic training. The period was between the 1st of December 2023 and the 1st of April 2024.

2.2. Study population and sample size

Students of pharmacy were included as the study population. 412 participants from TIU were recruited as the study population. The sampling method employed was convenience sampling, which is a quantitative research approach that selects participants based on their accessibility and the ease which they can be included in the study. This sample size was determined to ensure sufficient statistical power to detect meaningful associations between KAP regarding OTC drugs. This size also enhances the reliability and generalizability of the findings while accounting for potential non-response or incomplete data.

2.3. Study design

A quantitative descriptive cross-sectional design was chosen for its simplicity, speed, and cost-effectiveness, making it ideal for assessing pharmacy students' KAP regarding OTC drugs. It provides a clear view of current behaviors and beliefs, identifies areas for educational intervention, and helps explore associations between KAP, and is well-suited for estimating the prevalence of beliefs, attitudes, and behaviors related to OTC drug use (11). Upon receiving informed consent, each student was delivered with a questionnaire regarding OTC drugs. An anonymous questionnaire was comprised of both open-ended and closed-ended questions (like demographic details, health conditions, and OTC medicine use and its frequency). The questionnaire was adopted from a similar study and validated by one PhD holder and two assistant professors (3). A Google Forms questionnaire was used to collect the data. It is reliable for self-assessment and ensures anonymity. However, reliance on self-reported data is one of the study's limitations, which can introduce biases such as recall bias that may lead to underreporting or overreporting of behaviors regarding OTC drug use. Another potential bias is social desirability bias where they may overstate their knowledge about OTC drugs or underreport unsafe practices. Despite these limitations, the use of a Google Forms questionnaire was considered the most appropriate and practical method for this study. It enabled the collection of a large volume of data in a time-efficient and cost-effective manner, while also maintaining the confidentiality of respondents. Furthermore, the ease of access and user-friendly interface increased participant engagement and response rates. The study adhered to ethical principles in accordance with the Declaration of Helsinki. Verbal consent was obtained from participants willing to take part in the study, and everything was clarified for them. Their participation is voluntary, and their personal information will be kept secret.

Table 1: Sociodemographic characteristics (n=412)

Variables		n	%	M	SD
Gender	Female	241	58.5%	1.41	0.49
	Male	171	41.5%		
Age in years:	20-22	290	70.4%	21.91	1.2
	23-25	117	28.4%		
	25>	5	1.2%		
Marital status:	Married	8	1.9%	1.98	0.13
	Single	404	98.1%		
Year of study:		1	0.2%	3.28	1.41
	1 st year	60	14.6%		
	2 nd year	62	15.0%		
	3 rd year	111	26.9%		
	4 th year	57	13.8%		
	5 th year	121	29.4%		

Abbreviations and symbols: n (number of participants), % (percentage of participants), M (mean), SD (standard deviation).

2.4. Inclusion criteria

Undergraduate pharmacy students at TIU and over 18 years old, across any of the five academic stages (1st to 5th year) were enrolled because they represent future healthcare professionals who will play a critical role in guiding patients on the safe and effective use of medications, including OTC drugs. Their educational background provides them with a more advanced understanding of pharmacology, drug interactions, and medication safety compared to the general population. Additionally, only students who willingly agreed to participate and gave informed verbal consent were included, and students who were present and available during the data collection period were included in the study.

2.5. Exclusion criteria

Participants over 45 years old, those from other departments, and who submitted incomplete questionnaires or provided inconsistent answers were excluded during data analysis.

3. Results

3.1. Sociodemographic characteristics

As shown in **Table 1**, the total number of participants was 412 pharmacy students; 241 (58.5%) were female, while 171 (41.5%) were male, and the majority of participants, 290 (70.4%), were within the age group of 20-22. Overall, the participants were mostly mid-stage students with a mean year of study of 3.28 ± 1.41 , among them, 121

(29.4%) were seniors (5th-year students), while only 60 (14.6%) were freshmen (1st-year students).

3.2. OTC drug knowledge

The findings in **Table 2**, revealed that most students, 311 (75.5%), believe that OTC medications are safe and effective, whereas 54 (13.1%) think that it is okay to use OTC drugs past their expiry date. In addition, most students, 287 (69.7%), are aware that OTC drugs can cause side effects sometimes, while only 29 (7%) responded with "Do not know". However, 168 (40.8%) believe that all OTC drugs are safe to use alongside prescribed medications, while 75 (18.2%) were unsure about their safety. 163 students (39.6%) acknowledge that OTC medications can lead to drug interaction. 80 (19.4%) of the students consider OTC drugs as a cheaper and more convenient option. Additionally, 232 (56.3%) of students strongly agree with the statement that it is appropriate to treat minor ailments with OTC medications, while 302 (73.3%) of the students are aware of the precautions necessary when OTC medications are taken by pregnant women. The majority of students, 369 (89.6%), understand that paracetamol is a safe and effective OTC medication when taken correctly, but excessive intake can cause liver damage. Moreover, 109 (26.5%) agreed and 159 (38.6%) strongly agreed that consulting a pharmacist about current medications is important when taking an OTC drug, while only 26 (6.3%) disagreed and 14 (3.4%) strongly disagreed. Lastly, only 17 of the participants (4.1%) disagreed and 10 (2.4%) strongly disagreed with the statement that OTC drugs can modify or alter the action of another drug, while the majority, 163 (39.6%), agreed, and 161 (39.1%) strongly agreed.

3.3. OTC drug practice

Most students, **Table 3**, 365 (88.6%), have practiced SM with OTC medications before. Among them, 81 (19.7%) take OTC medications whenever they feel sick, and 74 (18%) resort to using OTC drugs whenever they can't visit a doctor. Regarding safety, 110 (26.7%) of the participants have experienced adverse effects from OTC medications before. 72 (17.5%) of the students had taken more than the recommended dose. Only 31 (7.5%) either never, rarely, or sometimes check for expiry date. Moreover, a significant majority, 380 (92.2%), immediately discard OTC drugs as soon as they observe any changes in color, odor, or shape, though a small minority, 12 (2.9%), do not do so.

Table 2: OTC Drug Knowledge Questionnaire (N=412)

QUESTIONS	Answers	n	%
ALL OTC DRUGS ARE SAFE AND EFFECTIVE.	Do not know	25	6.1%
	No	76	18.4%
	Yes	311	75.5%
OTC DRUGS ARE USED USUALLY FOR TREATING DISEASE LIKE:	Chronic illnesses	14	3.4%
	Do not know	20	4.9%
	Minor illnesses and injuries	378	91.7%
OTC DRUGS COULD BE USED AFTER EXPIRY DATE.	Do not know	16	3.9%
	No	342	83.0%
	Yes	54	13.1%
OTC DRUGS CAN CAUSE SIDE EFFECTS.	Do not know	29	7.0%
	Mostly	92	22.3%
	Never	4	1.0%
	Sometimes	287	69.7%
ALL OTC DRUGS WHEN TAKEN ALONG WITH THE PRESCRIBED DRUGS ARE SAFE.	Do not know	75	18.2%
	No	169	41.0%
	Yes	168	40.8%
WHILE USING OTC DRUGS, CAUTION SHOULD BE TAKEN MOSTLY DURING:		2	0.5%
	Adolescent/middle age adults	25	6.1%
	Children	47	11.4%
	Elderly	23	5.6%
	Lactation	13	3.2%
	Pregnancy	302	73.3%
IF SUSPECTED SIDE EFFECTS(S) ARE SEEN THEN ONE SHOULD:	Continue taking the drugs regardless of the side effects	7	1.7%
	Immediately stop using the drug	226	54.9%
	Report to a doctor	159	38.6%
	Take low dose until side effects subside	20	4.9%
OTC MEDICINES ARE MEDICINES YOU CAN BUY WITHOUT A PRESCRIPTION.	Do not know	20	4.9%
	No	17	4.1%
	Yes	375	91.0%
PAINKILLER IS AN EXAMPLE OF AN OTC MEDICATION.	Do not know	15	3.6%
	No	13	3.2%
	Yes	384	93.2%
PARACETAMOL (SUCH AS PANADOL) IS SAFE AND EFFECTIVE WHEN USED CORRECTLY BUT TAKING TOO MUCH CAN LEAD TO LIVER DAMAGE.	Do not know	36	8.7%
	No	7	1.7%
	Yes	369	89.6%
OVER-THE-COUNTER (OTC) DRUGS ARE CHEAPER AND CONVENIENT.	Agree	80	19.4%
	Disagree	53	12.9%
	Neutral	147	35.7%
	Strongly agree	66	16.0%
	Strongly disagree	66	16.0%
OVER-THE-COUNTER DRUGS CAN MODIFY OR ALTER THE ACTION OF ANOTHER DRUG.	Agree	163	39.6%
	Disagree	17	4.1%
	Neutral	61	14.8%
	Strongly agree	161	39.1%
	Strongly disagree	10	2.4%
IT IS APPROPRIATE TO SEEK A PHARMACIST ADVICE WHEN SOMEONE HAS OTC MEDICINES THAT SHE/HE HAS NEVER USED BEFORE.	Agree	149	36.2%
	Disagree	13	3.2%
	Neutral	40	9.7%
	Strongly agree	197	47.8%
	Strongly disagree	13	3.2%
WHEN SOMEONE WENT TO A PHARMACY FOR OTC MEDICATION, HE/SHE SHOULD BRING ALL MEDICATIONS SHE/HE IS CURRENTLY TAKING.	Agree	109	26.5%
	Disagree	26	6.3%
	Neutral	104	25.2%
	Strongly agree	159	38.6%
	Strongly disagree	14	3.4%
IT IS APPROPRIATE TO TREAT MINOR-AILMENTS LIKE A COMMON COLD WITH OTC MEDICATION.		1	0.2%
	Agree	118	28.6%
	Disagree	10	2.4%
	Neutral	38	9.2%
	Strongly agree	232	56.3%
OTC DRUGS ARE NOT AFFECTED BY STORAGE CONDITIONS LIKE TEMPERATURE MOISTURE AND DIRECT SUNLIGHT.	Strongly disagree	13	3.2%
		2	0.5%
	Agree	15	3.6%
	Disagree	64	15.5%
	Neutral	26	6.3%
	Strongly agree	12	2.9%
	Strongly disagree	293	71.1%

Table 3: OTC Drug Practice Questionnaire (N=412)

QUESTIONS	Answers	n	%
HAVE YOU EVER PRACTICED SELF-MEDICATION WITH OTC MEDICINE?		3	0.7%
	Do not know	14	3.4%
	No	30	7.3%
	Yes	365	88.6%
WHEN DO YOU USUALLY CONSUME OTC MEDICINES?		3	0.7%
	Symptoms are minor or manageable	254	61.7%
	Whenever I cannot visit doctor	74	18.0%
	Whenever I feel sick	81	19.7%
HAVE YOU EXPERIENCED ADVERSE EFFECTS FROM THE OTC MEDICINE?	Do not know	28	6.8%
	No	274	66.5%
	Yes	110	26.7%
HAVE YOU EVER TAKEN MORE THAN THE RECOMMENDED DOSE FOR THE OTC MEDICINES?	Do not know	9	2.2%
	No	331	80.3%
	Yes	72	17.5%
HOW OFTEN DO YOU CHECK THE EXPIRY DATE?	Always	343	83.3%
	Never	3	0.7%
	Often	38	9.2%
	Rarely	5	1.2%
	Sometimes	23	5.6%
		2	0.5%
HOW OFTEN DO YOU STORE YOUR OTC MEDICINES IN A COOL, DRY PLACE OR AS STATED ON THE LABEL?	Always	301	73.1%
	Never	4	1.0%
	Often	75	18.2%
	Rarely	5	1.2%
	Sometimes	25	6.1%
		1	0.2%
IF THE OTC MEDICINE SHOWED A CHANGE IN SHAPE, COLOR OR ODOR I WOULD IMMEDIATELY DISCARD THE MEDICINE?	Do not know	19	4.6%
	No	12	2.9%
	Yes	380	92.2%

3.4. Factors associated with OTC medication use

As evidenced by the chi-square test results, **Table 4**, there is a significant association between gender and two questions regarding OTC drug knowledge. Females were more likely than males to respond “No” to the statement that all OTC drugs are safe when taken with other prescribed medications ($P < 0.01$), suggesting a higher level of caution or awareness about drug interactions among female participants. In contrast, males were more likely to respond “Agree” and “Strongly Agree” to the statement that OTC drugs can modify or alter the action of another drug ($P < 0.01$), indicating that while males might recognize drug interactions, they may simultaneously underestimate the risks associated with concurrent drug use.

As for the association between age groups and OTC drug knowledge **Table 5**, the 23-25 age group was more aware of the safety of paracetamol and its potential to cause liver damage with excessive use, with a statistically significant difference ($P < 0.01$). This group also had higher responses of “Sometimes” to the questions that OTC can cause side effects, though this difference was not statistically significant ($P > 0.05$). In other areas, the 20-22 and 23-25 age groups showed comparable results; however, the 20-22 group had slightly higher rates of “Agree” and “Strongly

Agree” responses to the statement that OTC drugs can modify or alter the action of another drug, with a significant difference ($P < 0.05$).

In terms of OTC drug practice **Table 4**, females were less likely to report experiencing adverse effects from OTC medications, though this difference was not statistically significant ($P > 0.05$). Both genders, however, were as likely to have taken more than the recommended dose of an OTC medication.

Regarding age groups **Table 5**, the 23-25 age group had the highest percentage of students reporting adverse effects from OTC drugs, with a very significant difference ($P < 0.01$). This may be attributed to their more frequent or varied use of OTC medications or an increased awareness and recognition of side effects compared to younger groups.

Those who agreed that OTC drugs are safe and effective **Table 6**, were more likely to be aware of their side effects and to agree that OTC drugs can modify or alter the action of another drug, with a highly significant difference ($P < 0.01$). However, they were more likely to think that all OTC drugs are safe when used concurrently with other drugs, with a very significant difference ($P < 0.01$). Additionally, those who answered with “Do not know” to the statement that OTC drugs are safe and effective showed

lesser awareness of the safety of paracetamol and its potential to cause liver damage when used excessively, with a highly significant difference ($P<0.01$). Lastly, a statistically significant difference revealed that those who

disagreed with the statement that OTC drugs are safe and effective were more likely to have experienced adverse effects from OTC drugs ($P<0.01$).

Table 4: Association between gender and OTC drug knowledge and practice

Variables		Gender				Chi-square test (p-value)
		Female		Male		
		n	%	n	%	
All OTC drugs when taken along with the prescribed drugs are safe:	Do not know	55	13.3%	20	4.9%	11.232 (0.004)**
	No	101	24.5%	68	16.5%	
	Yes	85	20.6%	83	20.1%	
Over-the-counter drugs can modify or alter the action of another drug:	Agree	76	18.4%	87	21.1%	18.668 (0.001)**
	Disagree	11	2.7%	6	1.5%	
	Neutral	41	10.0%	20	4.9%	
	Strongly agree	109	26.5%	52	12.6%	
	Strongly disagree	4	1.0%	6	1.5%	
Have you experienced adverse effects from the OTC medicine?	Do not know	19	4.6%	9	2.2%	1.218 (0.544)
	No	160	38.8%	114	27.7%	
	Yes	62	15.0%	48	11.7%	
Have you ever taken more than the recommended dose for the OTC medicines?	Do not know	5	1.2%	4	1.0%	0.035 (0.983)
	No	194	47.1%	137	33.3%	
	Yes	42	10.2%	30	7.3%	

* $p<0.05$, ** $p<0.01$

Table 5: Association between age groups and OTC drug knowledge and practice

Variables		Age in years:						Fisher Exact test (p-value)
		20-22		23-25		>25		
		n	%	n	%	n	%	
OTC drugs can cause side effects:	Do not know	24	5.8%	4	1.0%	1	0.2%	4.437 (0.618)
	Mostly	63	15.3%	28	6.8%	1	0.2%	
	Never	3	0.7%	1	0.2%	0	0.0%	
	Sometimes	200	48.5%	84	20.4%	3	0.7%	
Paracetamol (such as Panadol) is safe effective when used correctly but taking too much can lead to liver damage:	Do not know	32	7.8%	4	1.0%	0	0.0%	17.046 (0.002)**
	No	5	1.2%	1	0.2%	1	0.2%	
	Yes	253	61.4%	112	27.2%	4	1.0%	
Over the counter drugs can modify or alter the action of another drug:	Agree	129	31.3%	32	7.8%	2	0.5%	19.335 (0.013)*
	Disagree	10	2.4%	7	1.7%	0	0.0%	
	Neutral	42	10.2%	18	4.4%	1	0.2%	
	Strongly agree	102	24.8%	58	14.1%	1	0.2%	
	Strongly disagree	7	1.7%	2	0.5%	1	0.2%	
Have you experienced adverse effects from the OTC medicine?	Do not know	20	4.9%	7	1.7%	1	0.2%	15.618 (0.004)**
	No	204	49.5%	70	17.0%	0	0.0%	
	Yes	66	16.0%	40	9.7%	4	1.0%	

* $p<0.05$, ** $p<0.01$

Table 6: Association between several questions

Variables		All OTC drugs are safe and effective:						Chi-square test (p-value)
		Do not know		No		Yes		
		n	%	n	%	n	%	
All OTC drugs when taken along with the prescribed drugs are safe:	Do not know	18	4.4%	5	1.2%	52	12.6%	82.919 (0.000)**
	No	1	0.2%	54	13.1%	114	27.7%	
	Yes	6	1.5%	17	4.1%	145	35.2%	
Paracetamol (such as Panadol) is safe effective when used correctly but taking too much can lead to liver damage:	Do not know	10	2.4%	4	1.0%	22	5.3%	56.501 (0.000)**
	No	3	0.7%	3	0.7%	1	0.2%	
	Yes	12	2.9%	69	16.7%	288	69.9%	
Over the counter drugs can modify or alter the action of another drug:	Agree	13	3.2%	27	6.6%	123	29.9%	81.437 (0.000)**
	Disagree	3	0.7%	7	1.7%	7	1.7%	
	Neutral	6	1.5%	30	7.3%	25	6.1%	
	Strongly agree	3	0.7%	9	2.2%	149	36.2%	
	Strongly disagree	0	0.0%	3	0.7%	7	1.7%	
Have you experienced adverse effects from the OTC medicine?	Do not know	10	2.4%	6	1.5%	12	2.9%	49.441 (0.000)**
	No	10	2.4%	46	11.2%	218	52.9%	
	Yes	5	1.2%	24	5.8%	81	19.7%	

*p<0.05, **p<0.01

4. Discussion

In this study, the gender distribution was nearly balanced, with females dominating (58.5%). This aligns with the trend in Iraq, where most students enrolled in pharmacy schools are predominantly female (12). In addition, the 20-22 age group was the majority of the participants (70.4%) with a mean age of 21.91 ± 1.2 , similar to several studies conducted at Iraqi universities (10, 13-15), as this age group is typically in their 3rd to 5th year of study. This correlates with the study's mean year of study, 3.28 ± 1.41 . Overall, the students had a moderate level of OTC drug knowledge, with an average of 77.2% correct responses across the questions. This may be attributed to their academic curriculum. This correlates with similar studies also done on pharmacy and medical students (3, 7, 15, 16). In contrast, studies that focused on the general population have reported relatively lower OTC drug knowledge (17, 18). This difference is also seen in a study that compared people with a pharmacy background to those without, highlighting the superior knowledge of the former group (19). This suggests that professional training and education in pharmacy schools significantly enhance understanding of OTC drugs. The results showed that a good majority (75.5%) believe that all OTC drugs are safe and effective, yet they still don't deny the fact that they can also cause side effects sometimes (69.7%). This suggests that students may be underestimating the potential risks of OTC drugs, despite their awareness of side effects. For instance, the

majority (89.6%) were aware of paracetamol's potential to cause liver damage when used excessively. Paracetamol's liver toxicity with excessive use or overdose is widely known, as several studies have shown (5, 20, 21). What's concerning is that, although a small percentage (13.1%), a good number of pharmacy students think it's acceptable to use OTC drugs beyond their expiry date. This is also seen in some studies (3, 5, 7). Even more alarming, many students (40.8%) believe that all OTC drugs are safe to use with other prescribed medications. This is not the case, as certain OTC drugs, such as NSAIDs like ibuprofen, can react with antihypertensive medications like ACE inhibitors and increase blood pressure, leading to adverse health outcomes (22). Despite that, the majority (78.7% agreed or strongly agreed) agree that OTC drugs can modify or alter the action of other medications. This reveals a contradiction in their understanding and shows a gap between theoretical knowledge and practical understanding. They may also misunderstand what "altering the action" of medications actually means, believing it only reduces the drug's effectiveness but not cause serious side effect due to the interaction.

The prevalence of SM among these pharmacy students was 88.6%, a high prevalence was also seen in multiple studies conducted in Ethiopia, Spain, Malaysia, Northern Ireland, and Iraq (3, 7, 23-25). This high prevalence could be due to their confidence in their OTC drug knowledge, given their academic background. Additionally, university students are often known to rely on OTC drugs to manage stress and minor ailments commonly experienced during their

academic studies (26). Moreover, SM with OTC drugs is highly prevalent among Iraqi people due to its convenience and cost-effectiveness, as it eliminates the need to visit or pay for a doctor's consultation (27, 28). This high prevalence of SM presents significant risks, even among pharmacy students. Overconfidence in personal knowledge without proper clinical consultation can lead to the misuse of medications, incorrect self-diagnosis, drug interactions, masking of serious illnesses, and potential adverse effects. Furthermore, frequent SM could normalize inappropriate practices that these future healthcare providers might later transfer to the general public through their professional advice. Although the students in this study showed good OTC drug practice, 17.5% admitted to taking doses higher than recommended for OTC medications, and 26.7% have reported experiencing side effects from OTC medications, aligning with a similar study (7). Although these percentages are relatively low, they are still concerning and suggest a need for greater awareness and education on the safe and proper use of OTC drugs.

The association between gender and OTC drug knowledge and practice was assessed using a chi-square test. Females were found to have slightly better OTC drug knowledge in specific areas, with significant differences, such as they were more likely to know that not all OTC drugs are safe with other prescribed medications. On the other hand, males were more likely to know that OTC drugs can modify or alter the action of another drug. Again, these two statements are similar, which shows a contradiction or inconsistency in their understanding. A similar study showed no significant difference between genders regarding OTC drug knowledge (7). Another study showed that male students had poorer knowledge regarding OTC drug safety (26). The association between age groups and OTC drug knowledge and practice was assessed using Fisher's exact test. The 23-25 age group was significantly more aware of paracetamol's potential to cause liver damage with excessive use and were more aware that OTC medications can sometimes cause side effects, though the latter difference was not statistically significant. This is not surprising as students gain more knowledge as they advance through their studies, a similar study also showed that older university students or those in advanced academic stages tend to have better OTC drug knowledge (7).

Regarding OTC drug practice, no statistically significant difference was found between the genders, though females were less likely to have experienced side effects from OTC medications. Several studies also showed no significant difference between genders regarding OTC drug practice (3, 7). As for age groups, the 23-25 group reported more side effects from OTC drugs, with a very significant difference. This could be attributed to a finding from a study that shows a higher prevalence of OTC drug use among older university students (29). Factors such as experience, academic stress, increased habitual use over time, or

greater confidence in their OTC knowledge may explain this trend.

Lastly, students who didn't believe that OTC drugs are safe and effective were more likely to have experienced side effects from OTC drugs, a statistically significant finding. This could be because students who have had negative experiences with OTC medications may get more skeptical about the safety and effectiveness of these drugs.

There are several limitations to this study that should be considered. First, the reliance on self-reported data may introduce biases such as recall bias and social desirability bias. Second, the study was conducted at a single institution (TIU), which may limit the generalizability of the findings to pharmacy students at other universities or in different regions. Lastly, the study lacked qualitative insights, as it relied solely on fixed-choice answers and did not explore deeper explanations, opinions, or personal experiences in participants' own words.

5. Conclusion

This study reveals that students possess a moderate level of OTC drug knowledge. They are aware of the potential side effects and drug interactions that come with them. Despite this, some still believe that all OTC drugs are safe to use with other medications. In terms of practice, the students showed good OTC drug practice, with a high prevalence of SM. However, a minority exhibited poor practice. These minorities that have misconceptions about OTC drugs and have some bad practices suggest the need for the integration of enhanced educational interventions into the curriculum. This could include a dedicated course on OTC drugs that provides more in-depth training on drug interactions, side effects, and the importance of informed decision-making in OTC drug use. Females showed slightly better OTC drug knowledge in certain areas, and in terms of practice, the genders were comparable. Similarly, the older age group (23-25) showed greater awareness of OTC drugs compared to the younger group (20-22), although their practices were largely similar. These findings suggest that while knowledge may vary across demographic groups, overall practices remain consistent.

Future studies could focus on tracking changes in OTC drug knowledge and practices over time. This would help understand how education and practical experiences during training influence OTC drug knowledge and practice. Another useful approach would be to compare the OTC drug knowledge and practices of pharmacy students with students from other health-related fields, such as nursing and medical students, to see if different curriculum result in differing levels of knowledge and practice. Additionally, conducting studies across multiple institutions and regions would help enhance the generalizability of the findings.

Conflict of Interest

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

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المعرفة والموقف والممارسة بشأن الأدوية المتاحة دون وصفة طبية بين طلاب الصيدلة

الخلفية: تُستخدم الأدوية التي تُصرف بدون وصفة طبية (OTC) بشكل شائع للعلاج الذاتي نظرًا لسهولة الحصول عليها وسلامتها المُتصورة؛ ومع ذلك، يمكن أن يؤدي الاستخدام غير السليم إلى نتائج صحية سلبية. بصفتهم مقدمي رعاية صحية في المستقبل، يلعب طلاب الصيدلة دورًا حيويًا في توجيه الجمهور بشأن الاستخدام المسؤول لهذه الأدوية. تهدف هذه الدراسة إلى تقييم معارف طلاب الصيدلة ومواقفهم وممارساتهم فيما يتعلق باستخدام الأدوية التي تُصرف بدون وصفة طبية، وبالتالي تقييم استعدادهم لتعزيز ممارسات العلاج الذاتي الآمن في المجتمع. **الطريقة:** أجريت دراسة مقطعية شملت 412 طالب صيدلة من إحدى جامعات إقليم كردستان العراق. تم جمع البيانات من خلال استبيان منظم تم توزيعه عبر نماذج جوجل. تم استخدام اختبار مربع كاي لاستكشاف الاختلافات المتعلقة بالجنس، بينما فحص اختبار فيشر الدقيق الاختلافات عبر الفئات العمرية. **النتائج:** من بين المشاركين، كان 241 (58.5%) من الإناث و171 (41.5%) من الذكور، بمتوسط عمر 21.91 ± 1.2 سنة ومتوسط سنة دراسية 3.28 ± 1.41 . كان معدل انتشار العلاج الذاتي بالأدوية التي لا تستلزم وصفة طبية مرتفعًا بشكل ملحوظ بنسبة 88.6%. كانت الطالبات أكثر عرضة بشكل كبير للاختلاف مع العبارة القائلة بأن جميع الأدوية التي لا تستلزم وصفة طبية آمنة عند استخدامها مع الأدوية الموصوفة ($P < 0.01$) لم تُلاحظ أي فروق ذات دلالة إحصائية بين الجنسين في ممارسات العلاج الذاتي. أظهر الطلاب الذين تتراوح أعمارهم بين 23 و25 عامًا وعيًا أعلى بكثير بسلامة الباراسيتامول وسميته ($P < 0.01$) وأفادوا بأنهم عانوا من المزيد من الآثار الجانبية الناجمة عن استخدام الأدوية التي لا تستلزم وصفة طبية ($P < 0.01$). **الاستنتاج:** يؤكد ارتفاع معدل انتشار استخدام الأدوية التي لا تستلزم وصفة طبية بين طلاب الصيدلة على الحاجة إلى تعزيز التعليم حول هذا الموضوع. في حين أظهر الطلاب عمومًا معرفة معتدلة وممارسات مسؤولة، إلا أن بعض المفاهيم الخاطئة والسلوكيات المحفوفة بالمخاطر لا تزال قائمة. كان الطلاب الأكبر سنًا والإناث أكثر وعيًا. يُوصى بدمج وحدات تعليمية مُخصصة للأدوية التي تُصرف دون وصفة طبية في مناهج الصيدلة لزيادة الوعي وضمان ممارسات أكثر أمانًا للعلاج الذاتي في المستقبل.

الكلمات المفتاحية: الموقف؛ المعرفة؛ الأدوية التي لا تستلزم وصفة طبية؛ الإدراك؛ طلاب الصيدلة؛ الممارسة؛ العلاج الذاتي.