ORIGINAL RESEARCH

# The Effects of Trade Names on the Misuse of Some Over-The-Counter Drugs and Assessment of Community Knowledge and Attitudes in Alkarak, Jordan

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**Purpose:** This study aimed to assess the knowledge and attitudes of the community toward the brand names of the most commonly used over-the-counter (OTC) analgesics in Alkarak, Jordan, as well as to assess community's self-medication behaviors that may lead to misuse of OTC drugs.

**Patients and Methods:** This is a questionnaire-based cross-sectional study performed between 7 September and 1 October 2023. The total number of recruited participants was 730 adults from Alkarak, Jordan. One-way ANOVA was used to determine the statistical differences among the means of independent groups. The reliability of each question was evaluated using Cronbach's alpha. The Cronbach's alpha was within the accepted range for all questionnaire items (0.7–0.9).

**Results:** Most participants were male (60.3%), with an average age equal to  $38 \pm 11.06$  years, having a bachelor's degree (61.0%) from humanity colleges (43.6%). The highest proportion of the participants were reported to be without chronic diseases and not under chronic medications (57.1%). This study revealed a low knowledge score regarding OTC drug brand names (2.86  $\pm$  0.99 out of five) and unfavorable attitudes toward OTC medicines (2.68  $\pm$ 1.04 out of five). However, the study finds a significant relationship between the level of education and knowledge and attitude toward OTC drug brand names (p-value < 0.001). Bachelor's holder participants had the lowest knowledge of OTC drug brand names, whereas the worst attitude was reported among below diploma participants. Many participants held misconceptions about OTC drug brand names that lead to consumption of the same drugs under different brand names at the same time; especially OTC analgesics.

**Conclusion:** Low levels of knowledge and unfavorable attitudes regarding OTC drug use from different brand names were reported. Increasing the awareness of the community and enhancing the role of physicians and pharmacists in OTC drug consumption may lead to decrease the misuse of these drugs.

Keywords: public health, healthcare, non-prescription drugs, brand name, analgesics

#### Introduction

Over-the-counter (OTC) products include non-prescription drugs such as analgesics, and cold and cough remedies.<sup>1,2</sup> OTC drugs are seen as a crucial component of Jordanian healthcare,<sup>3</sup> and the pharmaceutical market has steadily increased their use.<sup>4</sup> Consumers can obtain OTC medicines without a prescription since they have been determined to be safe and suitable for use without the guidance of a healthcare professional, such as a physician.<sup>5</sup> The general population sees OTC medications as safer than prescribed ones because they are defined without a prescription.<sup>6,7</sup> Patients self-diagnose their illnesses and self-medicate ineffectively as a result of this perception.<sup>8</sup>

© 2024 Shaqleh et al. This work is published and licensed by Dove Medical Press Limited. The full terms of this license are available at https://www.dovepress.com/terms. work you hereby accept the Terms. Non-commercial uses of the work are permitted without any further permission form Dove Medical Press Limited, provided the work is properly attributed. For permission for commercial use of this work, please ese paragraphs 4.2 and 5 of our Terms (https://www.dovepress.com/terms.php). The safety profile of OTC medications is comforting. However, the misuse or abuse can have negative clinical consequences. Misuse refers to using medicine for a valid medical purpose but in higher dosages or for a longer time than is advised, such as taking more analgesics than is advised to manage a headache<sup>9</sup> or the use of a drug for legitimate medical purposes, but in an incorrect manner.<sup>10</sup> Misuse of OTC medicines has led to misdiagnosis.<sup>11–13</sup> The term "abuse" refers to the non-medical use of a drug,<sup>9</sup> the use of illegal drugs or the excessive or improper use of prescription, OTC, or other medications for purposes other than those for which they were designed. Problems with the body, mind, emotions, and employment could result from drug abuse.<sup>14</sup>

Analgesics are among the most frequently used and misused medications. While being generally safe, analgesic nephropathy can be caused by using the same analgesic of various brands simultaneously.<sup>15</sup> The majority of adolescents take OTC analgesics, yet many are confused about the differences between generic and brand-name medications. Significant gaps in knowledge existed regarding OTC use, side effects, and contraindications, particularly for acetaminophen.<sup>16</sup>

Non-steroidal anti-inflammatory drugs (NSAIDs), which have analgesic, antipyretic, and anti-inflammatory characteristics, are among the most widely used treatments in the world.<sup>17</sup> Several NSAIDs (like ibuprofen and aspirin) are available as OTC in multiple countries due to their general safety and efficacy.<sup>18</sup> Although NSAIDs are safe and effective when used according to medical guidelines, inappropriate use can have a variety of negative effects.<sup>19–22</sup> Paracetamol is a better all-around alternative for the majority of people who need OTC analgesic medication, notwithstanding the potential for hepatotoxicity in overdose.<sup>23</sup> Enhancing patient education, pharmacovigilance, prescriber and pharmacist awareness concerning non- and extra-medical NSAIDs use and the associated health effects are necessary.<sup>19</sup>

Another major factor contributing to medication errors and possible detrimental consequences is drug name confusion. Look-alike or sound-alike medicine names are not always the cause of brand confusion. It can result from different generic ingredient brands, patients lacking knowledge of the names of their medications, or patients not understanding the contents of combination medications.<sup>24</sup>

The fact that the same medication is offered under several names in different formulations is one of the potential causes of drug name confusion.<sup>25</sup> The wide range of names given to modified-release formulations, including MR (Modified Release), XL (Extended Release), LA (Long-Acting), SR (Sustained Release), and Retard, might cause confusion between various formulation types.<sup>26</sup> Additionally, confusion might arise from two different brand names for the same medication.<sup>27</sup>

The World Health Organization defines self-medication as

the use of medicinal products by the consumer to treat self-recognized disorders or symptoms, or the intermittent or continued use of a medication prescribed by a physician for chronic or recurring diseases or symptoms. In practice, it also includes the use of the medication of family members, especially where the treatment of children or the elderly is involved.<sup>28</sup>

OTC drug use for self-medication is more widespread than prescription drug use globally. OTC medications are usually used to treat ailments that do not need close medical supervision or treatment.<sup>29</sup> These medications are used for self-medication to prevent illnesses and maintain health,<sup>30</sup> however, they can be abused or misused.<sup>31</sup> Self-medication is linked to a significant amount of OTC analgesic use.<sup>32</sup>

Patients all around the world are increasingly demanding unrestricted access to effective medications without the need for a prescription or a doctor's visit. As a result, more prescription-only medications (POM) are becoming available OTC, enabling patients to self-treat. Because private medical appointments are so expensive, self-medication is one of the most popular solutions. The situation may be even worse in remote or rural areas, where people are socially, economically, and educationally deprived and lack access to sufficient healthcare services. Other significant factors impacting self-medication include patient satisfaction with the healthcare professional, lengthy wait periods, the cost of the drugs, educational level, age, and gender.<sup>33–38</sup>

During the Coronavirus disease (COVID-19) pandemic, OTC drug sales significantly surged. According to a Swedish study, sales during various periods of the pandemic were up 96% compared to the pre-pandemic years.<sup>39</sup> The most typical COVID-19 symptoms are lethargy, fatigue, muscle soreness, dry cough, dyspnea or shortness of breath, fever, and gastrointestinal issues. The most popular OTC medicine is NSAIDs. Aspirin, ibuprofen, and naproxen are the most well-

known NSAIDs and are all sold OTC in most countries.<sup>40</sup> The use of OTC drugs increased from 48.4% before COVID-19 to 83.8% after COVID-19. More than half of people who take OTC medications are unaware of the recommended dosage or potential side effects. The danger of hazardous drug events and the consequences of undiscovered diseases tend to increase as more people use OTC medications.<sup>41</sup> During the COVID-19 pandemic, it was simpler to engage in inappropriate self-medication because of the easy access to medicines and the rising influence of social media. During the COVID-19 pandemic, the self-medication prevalence was a little higher than average. Analgesics and antipyretics were the most frequently utilized drugs. This made sense in light of the most prevalent reported ailments, which included headache, common cold, and flu-like symptoms. The most frequent justification for self-medication was prior exposure to similar conditions.<sup>42</sup>

Most adolescents take OTC analgesics, but many are confused about the differences between generic and brand-name versions. There are also large knowledge gaps regarding the usage of OTC medications, their side effects, and their contraindications, particularly for paracetamol.<sup>16</sup> A major patient safety problem is adolescents' misuse of OTC drugs, which leads to an increasing number of poisonings and visits to the Emergency Department, Teenagers frequently the perception that OTC drugs are harmless, even when taken in higher dosages than advised.<sup>43</sup>

Among the elderly, paracetamol, aspirin, and ibuprofen are the non-opioid analgesics most frequently used. Patients use these drugs for chronic joint problems, toothaches, fevers, and pains.<sup>44</sup> The use of NSAIDs in older people is linked to a higher risk of several negative side effects<sup>45,46</sup> including peptic ulcer disease, gastrointestinal bleeding, hypertension, stroke, and acute renal failure.<sup>47,48</sup> These adverse events, which significantly worsen myocardial dysfunction in heart failure patients, can raise cardiovascular morbidity and mortality.<sup>49,50</sup>

In this study, we aimed to assess the knowledge and attitudes of the community in Alkarak – Jordan about OTC brand names and their alternatives; especially OTC analgesics, and the self-medication behaviors that may lead to misuse of these drugs.

#### Materials and Methods

#### Study Design and Population

A cross-sectional study design was used. The researcher developed an electronic and paper form of the questionnaire. This study was conducted on individuals who were 18 years of age or older from the southern region of Jordan (Alkarak Governorate). The questionnaire was distributed anonymously and electronically via social media (Facebook and WhatsApp), between 7 September and 1 October 2023, while a paper questionnaire was distributed randomly among the community of Alkarak, Jordan.

The questionnaire was written in Arabic (the participants' native language) by the author and then back-translated to English.

#### Inclusion and Exclusion Criteria

The inclusion criteria were a convenient sample of individuals aged 18 years or above who live in Alkarak, Jordan. The exclusion criteria were individuals younger than 18 years of age or who do not live in Alkarak, Jordan.

#### Sample Size

The required sample size can be calculated via Cochran's formula (Cochran, 1977) as follows:

$$n_o = (z^2 pq)/e^2$$

Where  $n_o =$  the required sample size.

- z = the Z-score corresponding to the desired level of significance (eg 1.96 for 95% confidence interval).
- p = the estimated proportion of the population with a certain characteristic.
- q = 1 p (the proportion of the population without the characteristic).
- e = the desired margin of error

As of 7 September, 2023, the population of Alkarak, Jordan, according to the Department of Statistics, it stands at 32,000 individuals. The estimated number of samples needed to provide a 95% confidence interval and a 5% margin of error is 380. Nevertheless, a sample of 755 participants was selected from the 32000 total population. Only 730 of these responses met the requirements to be included.

## Questionnaire

The questionnaire was divided into four sections: (1) Socio-demographic data of study sample (age, gender, educational level, education specialty, number of chronic diseases and number of daily medications), (2) knowledge about OTC drug brand names; which consists of two parts. The first part contains six questions that assess the knowledge about OTC drug brand names and if they contain the same active ingredient, (3) self-medication practices that contain eight questions (4) attitude toward OTC drugs that consists of four questions. The questionnaire was revised and validated by four relevant experts. The English version was reviewed by bilingual experts for accuracy to ensure that the translated version retained the intended meaning of questions. Before the main survey, a small-scale pilot study was tested on 5% (n = 20) of the intended audience. The volunteers were requested to answer the questionnaire in Arabic, their native language. The volunteers understood the questionnaire. No modifications were needed after the pilot study. The pilot test responses, however, were not included in the main study, because there were some modifications in the questions, aiming to obtain a fresh data set.

#### **Ethical Considerations**

The Scientific Research Committee at the School of Medicine/University of Jordan approved this study (reference number 19/2023/469). The questionnaire administered in the study clearly stated the purpose, and participation was voluntary. Additionally, the questions posed in the questionnaire did not reveal the participants' identities. The consent form was obtained from every participant either as a written form or by answering the consent form electronically. This study complies with the Declaration of Helsinki.

## Statistical Analysis

Data were assembled in Microsoft Excel, and statistical analyses were conducted in Statistical Package for the Social Sciences (IBM SPSS) version 26. The level of statistical significance was set at p-values < 0.050. One-way ANOVA was used to determine the statistical differences among the means of independent groups. In addition, descriptive tests (frequency, mean, and standard deviation).

The reliability of each question was evaluated using Cronbach's alpha. The Cronbach's alpha was within the accepted range for all questionnaire items (0.7–0.9).

The sample showed binomial distribution since the kurtosis of collected results ranged between -2 and +2. In addition to the symmetrical distribution of the data, skewness ranged from -0.5 to 0.5.

# Results

## Socio-Demographic Data the Studied Participants

Overall, 730 adult participants living in Al-Karak were enrolled and included in the final analysis. The vast majority of participants were male (n = 440, 60.3%), with an average age equal to  $38 \pm 11.06$  years, having a bachelor's degree (n = 445, 61.0%) from humanity colleges (n = 318, 43.6%). The highest proportion of the participants were reported to be without chronic diseases and not under chronic medications (n = 417, 57.1%) (Table 1).

# Community Knowledge About OTC Drug Brand Names

In general, the overall level of knowledge about OTC drug brand names was  $2.86 \pm 0.99$  out of five. A low knowledge score regarding OTC drug brand names was reported, ranging from 2.67 to 3.08 depending on our questionnaire. The lowest score was reported for the knowledge regarding the presence of the same active component with the same

		Frequency		
		Ν	%	
Gender	Female	290	39.7	
	Male	440	60.3	
Age	18–29	189	25.89	
	30–37	180	24.66	
	38–46	193	26.44	
	47–75	168	23.01	
Education level	Below Diploma	64	8.8	
	Diploma	145	19.9	
	Bachelors	445	61.0	
	Postgraduate	76	10.4	
College Type	Below diploma	64	8.8	
	Humanities colleges	318	43.6	
	Health colleges	53	7.3	
	Scientific colleges	295	40.4	
Suffering from Chronic disease	Diabetes mellitus	184	25.2	
	Cardiovascular diseases	129	17.7	
	Asthma	89	12.2	
	Kidney Impairment	72	9.9	
	Malignancy diseases	23	3.2	
Number of daily medications	0	417	57.1	
	I-3	163	22.3	
	> 3	150	20.5	

Table ISocio-DemographicCharacteristics of the StudiedParticipants(N = 730)

concentration in an alternative drug with a different brand name  $(2.67 \pm 1.43)$ , followed by thinking that all OTC painkillers are considered safe and effective  $(2.77 \pm 1.45)$ , getting highest effective when using more than one analgesic at the same time  $(2.80 \pm 1.36)$ , using the painkillers are safe even without feeling pain  $(2.89 \pm 1.45)$ , getting faster and greater effectiveness when using two different formulation of the same drug  $(2.91 \pm 1.33)$ , and knowing the possibility of OTC analgesics side effects  $(3.08 \pm 1.46)$ .

Using several OTC drugs from different brand names was reported in high proportion among the most commonly used OTC analgesics (paracetamol, diclofenac, ibuprofen) (Table 2). More than half of the participants did not distinguish between OTC drugs with the same active ingredient from different brand names. 63.7% of participants used other Panadol<sup>®</sup> alternatives at the same time as using Panadol<sup>®</sup>. Multiuse painkillers from different brand names were reported simultaneously in Revanin<sup>®</sup>, Diclogesic<sup>®</sup>, and Panda<sup>®</sup> (62.9%, 52.5%, and 50.1% respectively).

The participants mainly used Revanin<sup>®</sup>, and Panda<sup>®</sup> with Panadol<sup>®</sup> at the same time (21.2% and 13.3%, respectively), Voltfast<sup>®</sup> with Diclogesic<sup>®</sup> (18.2%), and Taskine<sup>®</sup> with Dolaraz<sup>®</sup> (19.3%).

		Frequency		
		Ν	%	
Drugs used with Panadol <sup>®</sup>	<b>Revanin<sup>®</sup></b>	126	17.3	
	Panda®	73	10.0	
	Relaxon <sup>®</sup>	80	11.0	
	Dolocet <sup>®</sup>	83	11.4	
	Myogesic <sup>®</sup>	103	14.1	
	None of the above	265	36.3	
Drugs used with Revanin <sup>®</sup>	Panadol <sup>®</sup>	155	21.2	
	Panda®	94	12.9	
	Relaxon <sup>®</sup>	68	9.3	
	Dolocet <sup>®</sup>	54	7.4	
	Myogesic®	88	12.1	
	None of the above	271	37.1	
Drugs used with Panda <sup>®</sup>	Panadol <sup>®</sup>	97	13.3	
	<b>R</b> evanin <sup>®</sup>	92	12.6	
	Relaxon <sup>®</sup>	41	5.6	
	Dolocet <sup>®</sup>	51	7.0	
	Myogesic®	85	11.6	
	None of the above	364	49.9	
Drugs used with Diclogesic <sup>®</sup>	Voltfast <sup>®</sup>	133	18.2	
	Voltaren®	70	9.6	
	Olfen <sup>®</sup>	95	13.0	
	Diclofenac <sup>®</sup>	85	11.6	
	None of the above	347	47.5	
Drugs used with Dolaraz <sup>®</sup>	Taskine®	141	19.3	
	lbumol <sup>®</sup>	47	6.4	
	<b>Balkaprofen<sup>®</sup></b>	50	6.8	
	Brufen <sup>®</sup>	79	10.8	
	None of the above	413	56.6	

 Table 2 Common Drug Combinations with OTC Analgesics (N = 730)

# Misuse of OTC Drugs

About half of the study participants (51.1%) did not consult the pharmacist or the physician before taking OTC drugs, 54.5% of the participants stated that they depend on self-medication due to the high viability and safety of OTC drugs. Different pattern of wrong practices was reported; 49.0% of participants were taking OTC medicine for a long time

without consulting a doctor or a pharmacist, 43.3% of participants did not read the leaflet when they depend on selfmedication, and 40.5% of participants were suffering from side effects as a consequence of self-medication (Figure 1).

High dependence on painkillers among study participants was reported as the most common practice to deal with tiredness (n = 389, 53.3%), whereas only 7.0% of participants (n = 51) visited a physician when they feel tired. Approximately, half of the participants (46.6%, n = 340) purchased drugs without a prescription up to three times during the last six months, followed by 34.1% (n = 249) reported more than six times, and 19.3% (n = 141) for 4–6 times (Figure 2).

The leading factors to self-medication are thinking that the health problems are not serious (67.4%), followed by saving time (66.3%), having a previous experience (63.0%), and saving money (62.6%) (Figure 3).



Figure I Patterns of self-medication.



I take painkillers = I go to the doctor = I go to the pharmacy = (1-3)times = (4-6) times = More than 6 times

Figure 2 Misuse of OTC medicines.



Figure 3 Reasons for self-medication.

# Community Attitude Toward OTC Medicines

In general, unfavorable attitudes toward OTC medicines were reported among the studied population. A low score (less than 3 out of 5) was reported in all items, with an overall score of  $(2.68 \pm 1.04)$ . Several negative attitudes were demonstrated, including (i) Taking OTC drugs without consulting about the therapeutic compositions  $(2.84 \pm 1.36)$ , (ii) taking more than one analgesic at the same time  $(2.72 \pm 1.45)$ , (iii) rejecting the alternative medicines in case of absence of prescribed trade name medicine  $(2.71 \pm 1.45)$ , and (iv) hesitancy regarding alternative drug's effectiveness  $(2.47 \pm 1.37)$ .

# Impact of Educational Level on Knowledge and Attitude

Although unfavorable attitude regarding OTC medications was observed among the studied population, a significant improvement in attitude was reported in correlation with advances in educational levels (*p*-Value < 0.001). Participants with less than a diploma had the poorest attitude score (1.66  $\pm$ 0.39), whereas bachelor's holder participants had the lowest knowledge score (2.69  $\pm$ 0.97). In addition, a significant difference in the average knowledge was reported among different educational level groups (*p* < 0.001) (Table 3).

		p-value			
	Below Diploma	Diploma	Bachelors	Postgraduate	
In general community attitude toward OTC medicines score	I.66 ±0.39	I.67 ±0.42	1.78 ±0.39	1.92 ± 0.35	<0.001*
In general community knowledge about OTC drug brand name score	2.82 ±1.07	3.03 ±0.99	2.69 ±0.97	3.51 ±0.64	<0.001*

Table 3	B Mean	of the	Overall	Knowledge	and A	ttitude	Score	in the	Studied	Populat	tion

Note: \*Significant correlation.

Abbreviations: SD, standard deviation; OTC, over-the-counter.

#### Discussion

Low knowledge about OTC drug brand names was reported in this study; the study participants lack knowledge about the most commonly used OTC drug alternatives; basically, they do not differentiate between generic and brand names of these drugs; this may occur because the brand name is sometimes unrelated to the generic name or therapeutic group. Confusion can arise when different manufacturers offer the same drug under different names.<sup>24</sup> Besides, participants believe that all OTC drugs are considered safe and effective. This perception leads to use OTC drugs, especially analgesics, more frequently and in higher doses or taking more than one analgesic simultaneously for faster and greater pain relief.

In this study, we found over half of the participants could not differentiate between different brand names for the same drug, so they took two drugs containing the same active ingredient at the same time, especially for the most commonly used OTC analgesics (paracetamol, diclofenac, and ibuprofen); more than half of participants used other Panadol<sup>®</sup> alternatives at the same time with Panadol<sup>®</sup>. Unintentional misuse of these products carries a significant risk and unfavorable occurrences, especially for heavy acetaminophen users and people with low levels of literacy.<sup>51</sup> Acetaminophen, the most widely used OTC medication in the United States, with 19% of adults reporting using it in a given week, has been the subject of recent attention due to its unintentional misuse.<sup>52–54</sup> The most common cause of acute liver failure is acetaminophen overdose.<sup>55–57</sup> Multiuse analgesics from different brand names were reported simultaneously in Revanin<sup>®</sup>, Diclogesic<sup>®</sup>, and Panda<sup>®</sup>, respectively.

The participants mostly used Revanin<sup>®</sup> and Panda<sup>®</sup> with Panadol<sup>®</sup> at the same time, Voltfast<sup>®</sup> with Diclogesic<sup>®</sup>, and Taskine<sup>®</sup> with Dolaraz<sup>®</sup>, this shows the prevalence of OTC drugs misuse, which could lead to overdosage toxicity and several health problems, so to prevent unwanted side effects, possible interactions, and inadvertent overdosing, patients must be aware of the drug active ingredient. According to a cross-sectional study at Jordanian population to assess the awareness about OTC medications; only 37% of participants reported being aware of the active ingredients of OTC drugs.<sup>58</sup>

The population studied generally had negative attitudes toward OTC medications; they rejected the alternative drug in case of the absence of a prescribed trade name drug and believed that the alternative drug is not as effective as the medicine prescribed by the physician; they take more than one analgesic at the same time to relieve pain; also, they are not concerned in knowing the therapeutic composition of the OTC drugs.

There is a correlation between the level of education and community knowledge and attitude regarding brand names of the most commonly used OTC analgesics in Alkarak, Jordan (p-value < 0.001). Participants with bachelor's degree had the lowest level of knowledge; this result can be explained as the number of bachelor's holder is the majority of the study and most of them from humanities colleges. The worst attitude was reported among participants with below diploma level of education. The majority of studies concur that individuals with low literacy are more likely to overdose,<sup>51</sup> utilize medications improperly, and fail to follow prescription regimens.<sup>59,60</sup> More than ten times as many literate people are likely to select the right drug and use its active ingredients in their logic.<sup>61</sup>

Self-medication represents a public health problem worldwide; According to a multinational cross-sectional study during the COVID-19 pandemic in the Arab region, the prevalence of self-medication practice was in Egypt: 72.1%, Yemen: 71.9%, Iraq: 69.3%, Jordan: 61.4%, Syria: 58.2, Saudi Arabia: 56.7%, Oman: 56.1%, Sudan: 53.8%, Algeria: 51.9% and in Palestine: 40.4%.<sup>42</sup> In Jordan, self-medication is a prevalent medical practice. Regrettably, a small proportion of patients sought therapeutic consultations from pharmacy staff members beyond simply expressing their illness.<sup>62</sup> The vast majority of participants in this study relied on self-medication by OTC drugs due to the high availability and perceived safety. However, several risky behaviors were also found: participants did not consult a pharmacist or a physician before taking OTC drugs, took medications for extended period without professional guidance, did not read the drug leaflet when they depended on self-medication, and they documented suffering from side effects from self-medication. To decrease the risk of side effects from self-medication, there is a need to expand the pharmaceutical care practices and telemedicine using special websites.<sup>63</sup>

According to our findings, more than half of the participants use OTC analgesics when they get a little tired; whereas only 7.0% visit a physician when experiencing tiredness and fatigue. This shows a high dependence on OTC analgesics

for self-medication, which is concise with a multinational cross-sectional study during the COVID-19 pandemic in the Arab region, which found that analgesics were the most consumed drugs by self-medication practice.<sup>42</sup> According to the participants, the most common reason for self-medication was the perception that health problems were not serious, followed by saving time, having a previous experience, and saving money. According to a study conducted in Amman, Jordan; the most frequent justifications for self-medication were that the illnesses were too mild to visit a physician, the lengthy wait to be seen by physicians, and avoiding the cost of physicians' visits.<sup>62</sup>

There are some limitations to this study. First, the reliance on self-reported data could lead to recall bias due to inaccurate or poor recall of medication behaviors among participants. Second, the survey sample is limited to a single geographical area (Alkarak, Jordan) and may not be representative of populations with other demographic features or cultural beliefs on OTC drug usage. Third, the design of the study is cross-sectional, preventing causation from being established between the level of education and knowledge and attitudes. Finally, the study's reliance on a questionnaire may have restricted its ability to capture understated perspectives or behaviors.

These findings highlight the importance of translating our knowledge of brand-name and generic drugs into increased public health awareness regarding the safe use of OTC equivalents. Pharmacists and healthcare providers must be empowered to become a voice in educating the community. Long-term studies to measure behavioral change over time and more investigation of interventions in specific sub-populations should form the basis of future research. At least, expanding the study to other regions may improve generalizability and enable the comparison of different cultures and contexts.

#### Conclusion

The study highlighted a lack of knowledge regarding OTC brand names, a negative attitude toward these medications, and some risky behaviors that contribute to their misuse. These findings emphasize the important role of community pharmacists in increasing awareness and promoting best practices to ensure the proper use of OTC drugs, especially considering the high prevalence of self-medication.

There are limitations to this study inherent in its cross-sectional design and single geographic site that may limit the generalizability of findings. Other limitations, such as the risk of self-reporting bias and an inability to gain more qualitative data, should also be considered.

One of the implications of this research is that with OTC drugs being used today, which falls into a blind spot, researchers need to pay attention to how OTC drug knowledge gaps and attitudes we see today affect those who are using OTC drugs. These findings underscore the significant services of pharmacists and healthcare providers as active mediators in mitigating misuse through education. Further research, development, and testing of community-specific educational programs and policy interventions would lead to potential improvements in the safe and informed use of OTC medications.

#### **Abbreviations**

OTC, over-the-counter; POM, prescription-only-medications; NSAIDs, Non-steroidal anti-inflammatory drugs.

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## **Author Contributions**

The corresponding author supervised the research and was involved in all of the research steps. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

## Disclosure

The authors report no conflicts of interest in this work.

## References

- 1. Chan V, Tran H. Purchasing over-the-counter medicines from Australian pharmacy: what do the pharmacy customers value and expect? *Pharm Pract.* 2016;14(3):782. doi:10.18549/PharmPract.2016.03.782
- 2. Simon HK, Weinkle DA. Over-the-counter medications: do parents give what they intend to give? Arch Pediatr Adolesc Med. 1997;151 (7):654-656. doi:10.1001/archpedi.1997.02170440016003
- Albsoul-Younes A, Tahaineh L, Moumani B. Parents' knowledge, perception, and practices of over-The-counter medicines used for their children. Jordan J Pharm Sci. 2011;4(3):181–189.
- Ravichandran A, Basavareddy A. Perception of pharmacists regarding over-The-counter medication: a survey. *Indian J Pharmacol.* 2016;48(6):729. doi:10.4103/0253-7613.194857
- 5. Riva S, Monti M, Antonietti A. Simple heuristics in over-The-counter drug choices: a new hint for medical education and practice. Adv Med Educ Pract. 2011;59–70. doi:10.2147/AMEP.S13004
- 6. Bissell P, Ward PR, Noyce PR. The dependent consumer: reflections on accounts of the risks of non-prescription medicines. *Health*. 2001;5 (1):5-30. doi:10.1177/136345930100500101
- 7. Hughes L, Whittlesea C, Luscombe D. Patients' knowledge and perceptions of the side-effects of OTC medication. J Clin Pharm Ther. 2002;27 (4):243-248. doi:10.1046/j.1365-2710.2002.00416.x
- Qato DM, Alexander GC, Conti RM, Johnson M, Schumm P, Lindau ST. Use of prescription and over-The-counter medications and dietary supplements among older adults in the United States. JAMA. 2008;300(24):2867–2878.
- 9. Hughes GF, McElnay JC, Hughes CM, McKenna P. Abuse/misuse of non-prescription drugs. *Pharm World Sci.* 1999;21:251–255. doi:10.1023/ A:1008788726842
- Albsoul-Younes A, Wazaify M, Yousef A-M, Tahaineh L. Abuse and misuse of prescription and nonprescription drugs sold in community pharmacies in Jordan. Subst Use Misuse. 2010;45(9):1319–1329. doi:10.3109/10826080802490683
- 11. Cooper RJ. Over-The-counter medicine abuse-a review of the literature. J Subst Use. 2013;18(2):82-107. doi:10.3109/14659891.2011.615002
- 12. Bency A, Feba A, Anu J, Jiju V, Elessy B. OTC drugs and its abuse. J Med Plants Stud. 2017;5:92-94.
- 13. Munksgaard SB, Jensen RH. Medication overuse headache. Headache. 2014;54(7):1251-1257. doi:10.1111/head.12408
- 14. Health NIo. NCI Dictionary of Cancer Terms-National Cancer Institute. Available from: https://www.cancergov/publications/dictionaries/cancerterms. Accessed March 18, 2019.
- 15. Builders MI, Aguwa CN. Patients' attitudes towards analgesic usage in Nsukka community. 2012.
- Wilson KM, Singh P, Blumkin AK, Dallas L, Klein JD. Knowledge gaps and misconceptions about over-The-counter analgesics among adolescents attending a hospital-based clinic. Acad Pediatr. 2010;10(4):228–232. doi:10.1016/j.acap.2010.04.002
- 17. Mullan J, Weston KM, Bonney A, Burns P, Mullan J, Rudd R. Consumer knowledge about over-the-counter NSAIDs: they don't know what they don't know. *Aust N Z J Public Health*. 2017;41(2):210–214. doi:10.1111/1753-6405.12589
- Furst DE, Ulrich RW, Prakash S. Nonsteroidal anti-inflammatory drugs, disease-modifying antirheumatic drugs, nonopioid analgesics, and drugs used in gout. *Basic Clin Pharmacol.* 2001;8:596–624.
- Brennan R, Wazaify M, Shawabkeh H, Boardley I, McVeigh J, Van Hout MC. A scoping review of non-medical and extra-medical use of non-steroidal anti-inflammatory drugs (NSAIDs). Drug Saf. 2021;44:917–928. doi:10.1007/s40264-021-01085-9
- 20. Bally M, Dendukuri N, Rich B, et al. Risk of acute myocardial infarction with NSAIDs in real world use: bayesian meta-analysis of individual patient data. *BMJ*. 2017;357.
- 21. Jarcho JA, Ingelfinger JR, Hamel MB, D'Agostino RB, Harrington DP. Inhibitors of the renin–angiotensin–aldosterone system and Covid-19. *Mass Med Soc.* 2020:2462–2464.
- 22. McKeever A. Here's what coronavirus does to the body. National Geogr. 2020.
- 23. Peterson GM. Selecting nonprescription analgesics. Am J Ther. 2005;12(1):67-79. doi:10.1097/00045391-200501000-00010
- 24. Mamunuwa N, Jayamanne S, Wijekoon N, et al. Duplication errors due to brand name confusion; It is not always the name—Short case series. *Clin Case Rep.* 2023;11(9). doi:10.1002/ccr3.7795.
- 25. McNulty H, Spurr P. Drugs which can cause problems and confusion to health care staff. Pharm J. 1982;229:721-723.
- 26. Lesar TS. Prescribing errors involving medication dosage forms. J Gen Intern Med. 2002;17:579-587. doi:10.1046/j.1525-1497.2002.11056.x
- Schwab M, Oetzel C, Mörike K, Jägle C, Gleiter CH, Eichelbaum M. Using trade names: a risk factor for accidental drug overdose. Arch Intern Med. 2002;162(9):1065–1066. doi:10.1001/archinte.162.9.1065
- 28. World Health Organization. Guidelines for the regulatory assessment of medicinal products for use in self-medication. 2000.
- 29. Kamal M, Negm W, Abdelkader A, Alshehri A, Batiha G, Osama H. Most common over-The-counter medications and effects on patients. *Eur Rev* Med Pharmacol Sci. 2023;27(4).
- 30. Tachi T, Yoshida A, Kanematsu Y, et al. Factors influencing the use of over-The-counter drugs and health foods/supplements. *Die Pharmazie*. 2018;73(10):598–604.
- Akande-Sholabi W, Akinyemi OO. Self-medication with over-the-counter drugs among consumers: a cross-sectional survey in a Southwestern State in Nigeria. *BMJ Open*. 2023;13(5).
- 32. Perrot S, Cittée J, Louis P, et al. Self-medication in pain management: the state of the art of pharmacists' role for optimal over-the-counter analgesic use. *Eur J Pain*. 2019;23(10):1747–1762. doi:10.1002/ejp.1459
- 33. Abay S, Amelo W. Assessment of self-medication practices among medical, pharmacy, health science students in Gondar University, Ethiopia. *J Young Pharm.* 2010;2(3):306–310. doi:10.4103/0975-1483.66798
- 34. Habeeb G, Gearhart J. Common patient symptoms: patterns of self-treatment and prevention. J Miss State Med Assoc. 1993;34(6):179-181.
- 35. Omolase C, Adeleke O, Afolabi A, Ofolabi O. Self medication amongst general outpatients in a Nigerian community hospital. *Ann Ib Postgrad Med.* 2007;5(2):64–67. doi:10.4314/aipm.v5i2.64032
- 36. World Health Organization. The role of the pharmacist in self-care and self-medication: report of the 4th WHO Consultative Group on the Role of the Pharmacist, The Hague, The Netherlands. 1998.
- 37. Sharma R, Verma U, Sharma C, Kapoor B. Self-medication among urban population of Jammu city. *Indian J Pharmacol.* 2005;37(1):40. doi:10.4103/0253-7613.13856

- 38. Worku S. Practice of self-medication in Jimma Town. Ethiop J Health Dev. 2003;17(2):111-116.
- Eccles R, Boivin G, Cowling BJ, Pavia A, Selvarangan R. Treatment of COVID-19 symptoms with Over the Counter (OTC) medicines used for treatment of common cold and flu. *Clin Infect Pract.* 2023;19:100230. doi:10.1016/j.clinpr.2023.100230
- 40. Bleumink GS, Feenstra J, Sturkenboom MC, Stricker BHC. Nonsteroidal anti-inflammatory drugs and heart failure. Drugs. 2003;63:525-534. doi:10.2165/00003495-200363060-00001
- 41. Michael A, Mohan M, Jayanthi SMLT, Gunasekaran V. Perception analysis of the use of over-the-counter medications amid COVID-19: a cross-sectional study. J Pharm Negat Results. 2023:1543–1551.
- 42. Abdelwahed AE, Abd-Elkader MM, Mahfouz A, et al. Prevalence and influencing factors of self-medication during the COVID-19 pandemic in the Arab region: a multinational cross-sectional study. *BMC Public Health*. 2023;23(1):180. doi:10.1186/s12889-023-15025-y
- 43. Jonassen R, Hilland E, Harmer CJ, Abebe DS, Bergem AK, Skarstein S. Over-the-counter analgesics use is associated with pain and psychological distress among adolescents: a mixed effects approach in cross-sectional survey data from Norway. BMC Public Health. 2021;21(1):1–12. doi:10.1186/s12889-021-12054-3
- 44. Karłowicz-Bodalska K, Sauer N, Jonderko L, Wiela-Hojeńska A. Over the counter pain medications used by adults: a need for pharmacist intervention. Int J Environ Res Public Health. 2023;20(5):4505. doi:10.3390/ijerph20054505
- 45. Howard RL, Avery AJ, Slavenburg S, et al. Which drugs cause preventable admissions to hospital? A systematic review. *Br J Clin Pharmacol.* 2007;63(2):136–147. doi:10.1111/j.1365-2125.2006.02698.x
- 46. Pretorius RW, Gataric G, Swedlund SK, Miller JR. Reducing the risk of adverse drug events in older adults. *Am Fam Physician*. 2013;87 (5):331–336.
- 47. Barkin RL, Beckerman M, Blum SL, Clark FM, Koh E-K, Wu DS. Should nonsteroidal anti-inflammatory drugs (NSAIDs) be prescribed to the older adult? *Drugs Aging*. 2010;27:775–789. doi:10.2165/11539430-00000000-00000
- Jones SA, Bhandari S. The prevalence of potentially inappropriate medication prescribing in elderly patients with chronic kidney disease. *Postgrad* Med J. 2013;89(1051):247–250. doi:10.1136/postgradmedj-2012-130889
- 49. Gislason GH, Rasmussen JN, Abildstrom SZ, et al. Increased mortality and cardiovascular morbidity associated with use of nonsteroidal anti-inflammatory drugs in chronic heart failure. Arch Intern Med. 2009;169(2):141–149. doi:10.1001/archinternmed.2008.525
- 50. Page RL, O'Bryant CL, Cheng D, et al. Drugs that may cause or exacerbate heart failure: a scientific statement from the American Heart Association. *Circulation*. 2016;134(6):e32-69. doi:10.1161/cir.0000000000426
- 51. Wolf MS, King J, Jacobson K, et al. Risk of unintentional overdose with non-prescription Acetaminophen products. J Gen Intern Med. 2012;27:1587–1593. doi:10.1007/s11606-012-2096-3
- 52. Achaval S, Suarez-Almazor M. Acetaminophen overdose: a little recognized public health threat. *Pharmacoepidemiol Drug Saf.* 2011;20 (8):827-829. doi:10.1002/pds.2162
- 53. Li C, Martin BC. Trends in emergency department visits attributable to Acetaminophen overdoses in the United States: 1993–2007. *Pharmacoepidemiol Drug Saf.* 2011;20(8):810–818. doi:10.1002/pds.2103
- 54. Vernacchio L, Kelly JP, Kaufman DW, Mitchell AA. Medication use among children< 12 years of age in the United States: results from the Slone Survey. *Pediatrics*. 2009;124(2):446–454. doi:10.1542/peds.2008-2869
- 55. Bower WA, Johns M, Margolis HS, Williams IT, Bell BP. Population-based surveillance for acute liver failure. *Off J Am Coll Gastroenterol*. 2007;102(11):2459–2463. doi:10.1111/j.1572-0241.2007.01388.x
- 56. Larson AM, Polson J, Fontana RJ, et al. Acetaminophen-induced acute liver failure: results of a United States multicenter, prospective study. *Hepatology*. 2005;42(6):1364–1372. doi:10.1002/hep.20948
- 57. Ostapowicz G, Fontana RJ, Schiødt FV, et al. Results of a prospective study of acute liver failure at 17 tertiary care centers in the United States. Ann Intern Med. 2002;137(12):947–954. doi:10.7326/0003-4819-137-12-200212170-00007
- Taybeh E, Al-Alami Z, Alsous M, Rizik M, Alkhateeb Z. The awareness of the Jordanian population about OTC medications: a cross-sectional study. *Pharmacol Res Perspect*. 2020;8(1):e00553. doi:10.1002/prp2.553
- Lindquist LA, Go L, Fleisher J, Jain N, Friesema E, Baker DW. Relationship of health literacy to intentional and unintentional non-adherence of hospital discharge medications. J Gen Intern Med. 2012;27:173–178. doi:10.1007/s11606-011-1886-3
- Wolf MS, Davis TC, Osborn CY, Skripkauskas S, Bennett CL, Makoul G. Literacy, self-efficacy, and HIV medication adherence. *Patient Educ Couns*. 2007;65(2):253–260. doi:10.1016/j.pec.2006.08.006
- Yin HS, Mendelsohn AL, Wolf MS, et al. Parents' medication administration errors: role of dosing instruments and health literacy. Arch Pediatr Adolesc Med. 2010;164(2):181–186. doi:10.1001/archpediatrics.2009.269
- 62. Yousef A-M-M, Al-Bakri AG, Bustanji Y, Wazaify M. Self-medication patterns in Amman, Jordan. *Pharm World Sci.* 2008;30:24–30. doi:10.1007/s11096-007-9135-x
- 63. Alsayed AR, Halloush S, Hasoun L, et al. Perspectives of the community in the developing countries toward telemedicine and pharmaceutical care during the COVID-19 pandemic. *Pharm Pract*. 2022;20(1):1–12. doi:10.18549/PharmPract.2022.2.2652

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