

# Prevalence of Over-the-Counter Drug Abuse among Adults in Jeddah, Saudi Arabia

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## Abstract

**Objectives:** Self-medication, also known as the use of over-the-counter drugs, can be defined as the economical choice of using treatments that have not been prescribed, recommended, or controlled by a certified healthcare professional, which can be found in pharmacies or convenience stores to treat self-recognized illnesses or symptoms. Previous studies on self-medication in Saudi Arabia are limited; thus, this study aimed to evaluate the prevalence of over-the-counter drug abuse among an adult population in Jeddah, Saudi Arabia.

**Methods:** This was a cross-sectional study, and a validated electronic self-administered questionnaire was administered to the general population in Jeddah, Saudi Arabia, from June to August, 2020.

**Results:** Overall, 400 participants were included in this study. The majority (94%) reported the use of over-the-counter drugs, of which 15.2% reported drug-related problems following over-the-counter drug use. The most frequently preferred over-the-counter drug group was analgesics/antipyretics (90.4%). More than three-quarters of our study participants stated that they read the instructions provided in the leaflet accompanying their medications carefully before use (76.3%).

**Conclusion:** We found a highly significant prevalence of over-the-counter medication use, which exceeded 50%, without any significant association between over-the-counter use and other factors, except for the presence of chronic diseases. We recommend that, the Ministry of Health, Kingdom of Saudi Arabia should play a major role in monitoring the practice of self-medication by implementing policies and creating surveillance committees to that effect.

**Keywords:** Prevalence, over-the-counter, drug, abuse, adults, Jeddah

## Introduction

Self-medication, also known as the use of over-the-counter (OTC) drugs, refers to the cost-effective use of treatments not prescribed or recommended by a certified healthcare professional to treat self-identified illnesses or symptoms.<sup>1,2</sup> Because of their existing benefits, over-the-counter drugs are becoming more popular among the general population and the health-care system.<sup>3</sup>

First, the availability of over-the-counter medications allows patients to treat many common health conditions without the assistance of a health care professional. Second, it saves time for both patients with minor illnesses and medical staff, allowing them to focus on more complex cases. It also improves public health at a low cost by reducing the frequency of clinical visits. Third, it has a positive impact on the health-care system, particularly by reducing reliance on scarce and valuable health resources.<sup>3</sup> OTCs are classified into different categories by the World Health Organization's Anatomical Therapeutic Chemical classification, such as analgesics, laxatives, and sedatives. cough and cold medications, antihistamines, dermatologicals, and antidiarrheals.<sup>4</sup>

A previous study found that 57.7 percent of OTC drugs purchased from community pharmacies in Aden, Yemen, were used. 5 Furthermore, 285 medications were purchased without a prescription in a study conducted among adults in Riyadh. Of these, 49 percent should have been dispensed only by prescription, while 51 percent were OTC medications.<sup>5</sup>

Inadequate supervision can result in a variety of side effects due to drug-drug interactions, drug-food interactions,

and allergic reactions.<sup>6</sup> A drug-drug interaction is a change in the effect of a drug when two or more medications are used at the same time; this can increase the risk of side effects depending on the medication used.<sup>6</sup> When ibuprofen is combined with a prescribed anti-inflammatory medication, they will react together and produce more anti-inflammatory activity or pain relief than the body requires, which can be harmful to the kidneys and liver.<sup>7</sup>

A drug-food interaction is a change in the effect of a drug when it is combined with certain foods. It can cause a drug's absorption to be delayed, reduced, or increased, which can have negative consequences.<sup>8</sup>

Allergic reactions occur when the immune system recognizes the drug as an allergen and produces antibodies known as immunoglobulin E (IgE) that are specific to the drug. This reaction causes skin rashes, itching, wheezing, breathing difficulties, and anaphylactic shock, which can be fatal.<sup>9</sup>

Recently, there has been an increase in concern about the effects of OTC drug misuse on various populations. Locally, a study was conducted on the frequency of using non-prescribed medications in a population sample of 306 people in Al Madina city, as well as its impact on Saudi Arabia's quality of care. 72.5 percent reported using non-prescribed medication, and 24.3 percent reported experiencing side effects from using non-prescribed medications, with no significant difference between men and women. Analgesics were the most commonly used type of medication. 10 Furthermore, according to another study conducted in Poland among 386 adults, approximately 91 percent of participants declared that approximately 91% of participants declared using OTC pain relievers.<sup>10</sup>

Previous studies on self-medication in Saudi Arabia are limited. Therefore, this study aimed to evaluate the prevalence of OTC drug abuse among the adult population in Jeddah, Saudi Arabia.

## Methods

### Study Design

An observational cross-sectional study was conducted randomly among the general population in Jeddah, Saudi Arabia, from June to August, 2020.

### Sample Size

The sample size was 400 participants, which was calculated based on the creative research systems website with a confidence level of 95%.<sup>11</sup> The inclusion criteria were adults aged  $\geq 18$  years; all health care professionals were excluded from the study. All participants were invited to voluntarily participate in the study by advertisements through different social media platforms.

A previously validated, reliable, and self-administered questionnaire was used. It was adopted from the Al Madina study.<sup>12</sup> The questionnaire was designed using Google Forms (Mountain View, CA, USA), and it consisted of two sections: The first section contained demographic information (gender, age, marital status, level of education, and occupation), while the second section assessed participants' patterns of OTC drug use. Additionally, the questionnaire is attached as supplementary material.

### Ethical Considerations

The study was approved by the biomedical ethics research committee at authors' affiliated institution. Consent was obtained from all participants after they were notified around the study objectives and confidentiality of the responses in the introduction section of the electronic questionnaire.

### Statistical Analyses

The data were analyzed using SPSS software (Statistical Package for Social Sciences, Version 21). Frequency tests were used to describe qualitative data, quantitative data were expressed as mean and standard deviation (mean  $\pm$  SD), and the chi-square test was used to test the relationship between variables. A  $P$ -value  $< 0.05$  was considered statistically significant.

## Results

Initially, 576 responses were received, and only 400 participants were selected to be included in the study based on our inclusion criteria. Of these, there were 200 men (50%) and 200 women (50%), with a mean age of 36.93 ( $\pm 14.4$ ). More than half of the respondents (54.5%,  $n = 218$ ) were married, 188 (47%) were workers, and 314 (78.5%) had a high education level (Table 1).

Approximately 376 (94%) participants reported the use of OTC drugs. Among those, 209 (55.6%) remained healthy, and 57 (15.2%) reported drug-related side effects after the consumption of OTC drugs. Most participants stated that they read the instructions provided in the leaflet accompanying their medication carefully before use (76.3%). Diabetes was reported as the most common chronic disease among the

participants (27.4%), followed by hypertension (26.6%) and high cholesterol (19.1%) (Table 2).

A very high proportion of the participants (76.9%) used OTC drugs use in the past six months for less than five times. Participants mostly obtained their medications from private pharmacies ( $n = 337$ , 89.6%), followed by governmental hospital pharmacies ( $n = 21$ , 5.6%). Regarding the duration of OTC drug use, 239 respondents (63.6%) used medication for 1–3 days. In 280 (74.5%) participants, pharmacists had a major impact with regard to the correct dosage of OTC drugs, followed by their previous prescription ( $n = 144$ , 38.3%). Moreover, 276 (73.4%) participants reported that pharmacists were the main source of information when deciding to use an OTC drug, followed by their previous prescription ( $n = 137$ , 36.4%). The most frequently preferred OTC drug group was analgesics/antipyretics ( $n = 340$ , 90.4%), followed by vitamins and food supplements ( $n = 196$ , 52.1%) (Table 3).

Our results showed no significant relationship between reading the package insert and experiencing the side effects of OTC drugs ( $P = 0.610$ ) (Table 4).

Table 1. Sociodemographic profile of participants ( $n = 400$ )

Variables	Frequency	Percent	
Marital Status	Single	167	41.8
	Married	218	54.4
	Divorced/widowed	15	3.8
Job Status	Student	91	22.8
	Non worker	121	30.2
	Worker	188	47.0
Level of Education	Elementary	1	0.3
	High school/Technical	85	21.2
	Bachelor's degree and above	314	78.5

Table 2. Parameters related to non-prescribed medication

Parameters	Yes		No		
	<i>n</i>	%	<i>n</i>	%	
<i>N = 400</i>					
Have you ever used a non-prescribed medication?	376	94	24	6	
<i>N = 376</i>					
History of side effects with non-prescribed medications	57	15.2	319	84.8	
Reading insert leaflet	287	76.3	89	23.7	
Having chronic disease	167	44.4	209	55.6	
Chronic diseases	Hypertension	100	26.6	276	73.4
	Heart diseases	46	12.2	330	87.8
	High cholesterol	72	19.1	304	80.9
	Diabetes	103	27.4	273	72.6
	Endocrine disorders	29	7.7	347	92.3
	Nervous system disorders	23	6.1	353	93.9
	Skeletal/rheumatic disorders	41	10.9	335	89.1
Others	24	6.4	352	93.6	

Table 3. Parameters and pattern of administration of non-prescribed medication

Variables		Frequency	Percent
Frequency of use non-prescribed medication over the past 6 months	<5 times	289	76.9
	5–10 times	59	15.7
	>10 times	28	7.4
From where do you usually have the medication	Private pharmacy	337	89.6
	Governmental hospital pharmacy	21	5.6
	Private hospital pharmacy	15	4
	Free medical samples	3	0.8
Duration of taking non-prescribed medication	1–3 days	239	63.6
	3–6 days	103	27.4
	6–9 days	14	3.7
	>9 days	20	5.3
How can you define the dose of the medication	Pharmacists	280	74.5
	Previous prescription	144	38.3
	According to severity of symptoms	66	17.6
	Family and friends	54	14.4
Source of information when deciding to take a non-prescribed medication	Others	19	5.1
	Pharmacists	276	73.4
	Previous prescriptions	137	36.4
	Family and friends	123	32.7
	Personal experience	127	33.8
Type of medication commonly used	Mass media	56	14.9
	Others	2	0.5
	Analgesics/ antipyretics	340	90.4
	Antacids, antispasmodics, digestives	146	38.8
	Vitamins and food supplements	196	52.1
Type of medication commonly used	Antitussive/ anti-histaminic	177	47.1
	Creams and topical agents	184	48.9
	Chronic disease medications	12	3.2
	Antibiotics	74	19.7
	Others	3	0.8

Table 4. Participants who read package insert and reported complications

		Do you read the package insert?		Total	P-value
		No	Yes		
Have you experienced drug related problems?	no	74	245	319	0.610
	yes	15	42	57	
Total		89	287	376	

The duration of OTC drug use was not significantly associated with drug side effects ( $P = 0.144$ ) (Table 5).

By contrast, our results revealed a significant relationship between the presence of chronic disease and the use of OTC drugs ( $P < 0.001$ ) (Table 6).

There was no significant association between the use of OTC drugs and marital status, job status, level of education, and age (Table 7).

In (Figure 1) OTCs are classified into 8 categories, with analgesics being the most commonly used OTC and chronic

Table 5. The association of the duration of using over-the-counter (OTC) drugs and drug side effects

		How often do you use OTC drugs?				Total	P-value
		1–3 days	3–6 days	6–9 days	>9 days		
Have you experienced drug related problems?	no	209	81	13	16	319	0.144
	yes	30	22	1	4	57	
Total		239	103	14	20	376	

Table 6. The association of chronic disease with over-the-counter (OTC) drug use

		Have you ever used OTC drug?		Total	P-value
		No	Yes		
Chronic disease	Healthy	2	209	211	0.000
	Chronic disease	22	167	189	
Total		24	376	400	

Table 7. Association between Sociodemographic variables and over-the counter (OTC) drug use

		Have you ever used OTC drugs?		Total	P-value
		No	Yes		
Marital status	Single	12	155	167	0.480
	Married	12	206	218	
	Divorced/ widowed	0	15	15	
	Total	24	376	400	
Job status	Student	5	86	91	0.726
	Non-worker	9	112	121	
	Worker	10	178	188	
	Total	24	376	400	
Level of education	Elementary	0	1	1	0.604
	High school/ Technical	7	78	85	
	Bachelor's degree and above	17	297	314	
	Total	24	376	400	
Age of participants	<65	23	370	393	0.352
	>65	1	6	7	
	Total	24	376	400	

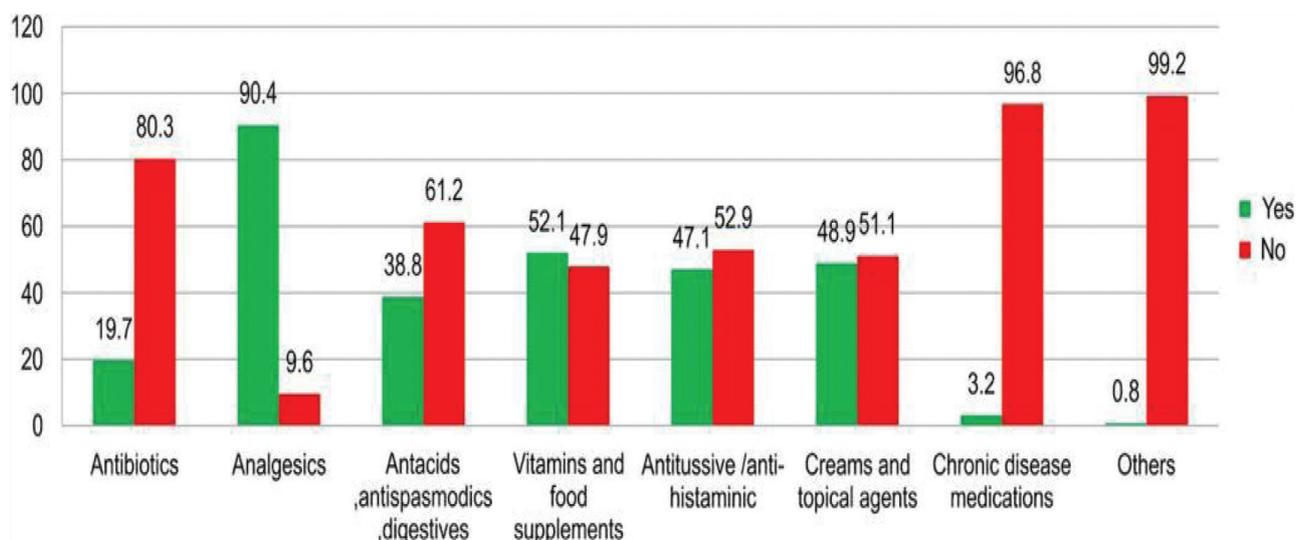


Fig. 1 Type of medication commonly used.

disease medications being the least commonly used. Analgesics (90.4%) was the most preferred OTC drug group, followed by vitamins and food supplements (52.1%) ( $P = 0.841$ , Figure 1).

## Discussion

This study determined the most commonly used OTC medication, the sources of information for OTC medication use, and the relationship between OTC medication use and various parameters. Over-the-counter (OTC) medication administration has been widely observed for several decades, particularly in developing countries.<sup>13</sup>

The main finding of our study was that 94 percent of study respondents used medications without a prescription, which is consistent with the findings of another study (93.1 percent) conducted in Majmaah, Saudi Arabia.<sup>14</sup> In contrast to other studies on the use of OTC drugs in Serbia (57.0 percent), the United Kingdom (38.0 percent), and Northern Ireland (32.2 percent), the prevalence of OTC medication use in our study was higher.<sup>15-17</sup> Furthermore, any significant OTC medication rate greater than 50% is more likely to pose a health risk.<sup>18</sup> The difference among the rates could be owing to variations in socio-economic factors, such as cultural beliefs, low cost, ease of access, the saving of time, and the severity of illness based on an individual's knowledge and previous experience.<sup>19</sup>

The most commonly used types of OTC medications among our respondents were analgesics (90.4 percent), followed by vitamins and food supplement drugs (52.1 percent). Analgesics were frequently used because they are available in a variety of brands, formulations, and doses and can be used to treat various types of pain.<sup>20</sup> This finding is consistent with the findings of a Wazaify study, which found that analgesics (76.4 percent) were the most commonly used, followed by minerals and/or vitamins (43.4 percent).<sup>17</sup> Antibiotics (22.3 percent) were the most common medication dispensed without prescriptions, contrary to the findings of a previous study in Saudi Arabia.<sup>3</sup>

We believe this reduction in antibiotic use was owing to the implementation of a new rule by the Ministry of Health that warns against selling antibiotics without prescriptions

and prohibiting pharmacists from dispensing any drug without a prescription issued by a licensed doctor to practice in the kingdom. Violation of this rule could result in imprisonment for up to six months, withdrawal of the license, and a fine that could reach 100,000 SAR.<sup>21</sup>

In our study, the main source was found to have a major influence on participants' choices of OTC drugs, which was the pharmacists' recommendation and that correlated with the results of four previous studies in Northern Ireland, Eritrea, and Japan.<sup>17,22</sup> Furthermore, pharmacists play a significant role in assisting with the safe and proper use of non-prescribed self-medication, as well as in resolving and avoiding drug-related problems in order to achieve ideal patient quality of life and the best outcomes. As a result, it is critical to consider this factor when accounting for both pharmacist practices and training. In contrast, media advertising was identified as the primary source of information in a study conducted in Pakistan (46.7 percent).<sup>23</sup>

A related study was conducted in 20 selected pharmacy outlets in Eritrea and reported that the percentage of respondents who read the package insert before using OTC drugs was very low, representing only one-third (35%) of the respondents. Additionally, a higher proportion of OTC drug users (81.8%) exhibited high risk practices.<sup>22</sup> In contrast to this finding, we discovered that 76.3 percent of respondents said they read the package insert. Furthermore, they reported drug-related issues as a result of self-medication (23.7 percent). This suggests that our respondents were more cautious in order to avoid unfavorable outcomes. As a result, it is critical to assist patients in making use of the information in package leaflets and to improve their understanding.<sup>24</sup> According to the findings, respondents with a higher level of education (bachelor's degree or higher) are more likely to use OTC, which is consistent with the findings of other studies because they can understand and read the descriptions on drug packages.<sup>15,25</sup>

In our study, there was no significant association between self-medication and educational level, which is in agreement with the finding of a study conducted in Al Majmaah city.<sup>14</sup> However, a study conducted in Hail reported a significant relationship with 71.5% ( $n = 663$ ) of the highly

educated responded affirmatively for receiving self-medication.<sup>26</sup> Similar trend was reported by a study conducted in Nepal.<sup>27</sup>

According to our findings, two-thirds (63.6 percent) of the participants used non-prescribed medication for 1–3 days, which is consistent with previous findings reported in Al Madina city.<sup>12</sup> OTC drugs can expose patients to unanticipated drug-related problems; 15.2 percent of our participants had a history of drug-related side effects, which was lower than the proportion reported in Al Madina city (24.3 percent).<sup>12</sup> There was no significant association ( $P = 0.144$ ) regarding the relationship between the duration of OTC drug use and the consequent complications. As shown in a previous study, patients with chronic disease using OTC medications had an increased risk of adverse drug reactions.<sup>28</sup> In our study, there was a significant relationship between having a chronic disease and the use of OTC drugs ( $P = 0.000$ ), which was similar to the results of a study conducted in Serbia ( $P = 0.019$ ).<sup>15</sup>

There are some limitations to our research. It is a cross-sectional study with recall and selection biases. The majority of the included participants were highly educated and over the age of 65, which does not represent the entire Jeddah because the questionnaire was not available for a diverse range of participants, such as illiterates and people from different socioeconomic backgrounds. Because our study only looked at the prevalence of OTC medication, more research is needed to determine the specific reasons that drive people to self-medicate.

## Conclusion

This study evaluated the prevalence of self-medication among adults in Jeddah, Saudi Arabia. It was found that a highly significant rate of OTC medication use was present among our participants, and this rate exceeded 50%; however, there was no significant association between OTC use and any other factors except for the presence of chronic diseases. Therefore, we advise the Ministry of Health, Kingdom of Saudi Arabia, to play a major role in monitoring the practice of self-medication by implementing policies and setting-up surveillance committees to that effect. Additionally, different platforms on social media should help raise awareness among society around the hazards of using non-prescribed medications, especially for long-term use. Moreover, our study suggests the importance of reassessing the list of medications that can be sold as OTC and providing a proper training program for community pharmacists. We also recommend that the Saudi Food and Drug Authority should carefully monitor drug companies and pharmacists.

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## Conflicts of Interest Disclosure

The authors declare that no conflicts of interest are related to this work. ■

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