ORIGINAL ARTICLE

Awareness and Behavioral Trends in Over-the-Counter Medication Usage among Adults in Saudi Arabia

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Abstract

Introduction: Over-the-counter (OTC) medications are widely accessible drugs that individuals can purchase without a prescription. While they offer convenience, the ease of access has contributed to a rise in self-medication practices. Self-medication, as defined by the World Health Organization, involves the use of medicines to treat self-recognized symptoms or conditions without professional supervision. In Saudi Arabia, recent studies indicate a growing prevalence of self-medication due to factors such as limited access to healthcare services, long clinic wait times, and reliance on advice from non-medical sources. Despite the increasing trend, there remains a substantial gap in knowledge regarding the safe use, risks, and behavioral patterns related to OTC medication use. **Objectives:** The aim of the study was to evaluate the level of public awareness regarding OTC medications and to describe the patterns and purposes of their use among adults residing in Saudi Arabia. **Materials and Methods**: This study is an observational cross-sectional survey conducted across various regions in Saudi Arabia between July and December 2025. Adults aged 18 and older who could read, had internet access, and consented to participate were included in the study. Data were collected using a structured, self-administered questionnaire assessing participants' knowledge, attitudes, and behaviors regarding OTC medication. The questionnaire underwent a pilot test, and scoring was based on Bloom's cut-off criteria. Data were entered using Microsoft Excel and analyzed using IBM SPSS Statistics version 25. **Results:** A total of 472 participants completed the survey (mean age 34.1 ± 12.4 years; 56.4% female; 93.4% Saudi). OTC medicines were the preferred option for self-medication (36.2%). Most participants demonstrated high knowledge (75.8%), while attitudes were predominantly low (47.5%) or moderate (46.8%). Self-medication was commonly practiced, with 7.6% reporting always and 22.9% often self-medicating. Community pharmacies were the main source of medicines (70.1%), and pharmacists were frequently consulted for dosing (72.3%). Safety practices were mixed: 48.3% always checked expiry dates, and 35.8% always read package inserts. Medicine sharing was common (59.8% always/sometimes), and 15.7% reported exceeding recommended doses. Most participants had moderate misuse risk (93.9%), with 13.6% reporting side effects after self-medication. **Conclusion:** Despite high knowledge regarding OTC medication safety, self-medication behaviors and moderate misuse risk were highly prevalent, indicating the need for targeted interventions to improve safe OTC use and reinforce appropriate healthcare-seeking behavior.

Key words: Drug safety, health behavior, over-the-counter medications, public awareness, Saudi Arabia, self-medication

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INTRODUCTION

Over-the-counter (OTC) medications are drugs that individuals can buy and use without needing a medical prescription.[1] Self-medication, as described by the World Health Organization, refers to "the consumption of medications to manage self-identified illnesses or symptoms, or the occasional or ongoing intake of prescription medications for persistent or recurring illnesses or their associated symptoms." Self-medication is commonly linked to the utilization of OTC drugs.[2] Self-medication using OTC medications has become a widespread global phenomenon and is considered a form of self-care, particularly for minor illnesses that do not require direct medical attention. In Saudi Arabia, self-medication practices have increased significantly over the years, despite the availability of free or subsidized healthcare. Cultural habits, previous experiences, and easy access to community pharmacies are among the main drivers of this behavior.[3] Self-medication is widely practiced in Saudi Arabia, with a reported prevalence ranging from 35% to 92%. Despite government healthcare coverage in Saudi Arabia, many residents still use OTC drugs.[4]

In 2020, a study found that nearly half of the participants (46.1%) had difficulty accessing hospitals, while 45.2% cited the inadequate services of health centers as a key reason for practicing self-medication. Other contributing factors included lack of medical insurance, insurance not covering medication costs, and mild symptoms that did not seem to require medical attention. The most frequently used self-medicated drugs were painkillers (84.58%), followed by fever reducers, cough syrups, eye drops, antibiotics, flu remedies, antacids, and joint pain medications.

In conclusion, self-medication is widespread among Saudi Arabians, with many depending on advice from relatives or friends rather than seeking professional medical guidance.[5]

In 2024, the average age of participants was 38.26 years. The mean knowledge score about OTC medications was 14.21 out of a possible total, with only 12% having adequate knowledge, 56.4% showing moderate knowledge, and about 31.6% demonstrating inadequate understanding of OTC drug safety. The average practice score was 20.7. Statistical analysis revealed significant associations between knowledge level and factors such as age, occupation, nationality, and marital status ($P < 0.01$). Moreover, there was a moderate positive correlation ($r = 0.386$) between participants' knowledge and their practices related to OTC medication use.[6]

A study published in 2025 involving of 200 participants, 79.5% were aware of possible drug interactions, and 74% supported tighter regulations on OTC medication sales. However, only 29.5% believed OTC drugs are safe without a doctor's supervision. Risky behaviors were evident – 15.5% admitted to taking higher-than-recommended doses, and 66% shared medications. While most participants (64.6%) consulted healthcare professionals for guidance, unsafe practices were still common, reflecting gaps in public awareness.[7]

In the 2025 study, women constituted the majority of participants (60.2%). Aged between 25 and 35 years (38.5%), and married (65.1%). Around 28.3% had chronic illnesses. Self-medication was common, reported by 82.3% of respondents, mainly for pain relief (55.5%), with painkillers being the most frequently used (65.6%). Key reasons for self-medication included long clinic wait times (51.1%) and using previously prescribed medications (44.1%). While participants generally had good knowledge about self-medication, it varied based on gender and education level.[8]

The increasing availability and accessibility of OTC medications have led to a surge in self-medication practices worldwide, including in Saudi Arabia; despite this trend, there remains a significant gap in knowledge regarding the awareness, behavior, and decision-making processes of adults when using OTC drugs. Many individuals are unaware of the potential risks, such as incorrect dosing, drug interactions, masking of serious conditions, or delayed medical consultation. Current literature in Saudi Arabia focuses mainly on specific age groups or healthcare professionals, with limited large-scale studies assessing the general adult population's awareness and behavior; insufficient data is evaluating the influence of cultural, educational, and socioeconomic factors on OTC medication use in Saudi communities. This study is therefore essential to fill these knowledge gaps, provide evidence for targeted public health interventions, and guide policies promoting safe and informed use of OTC medications across the kingdom.

Objectives

The objective of the study was to assess public awareness of OTC medicines and describe their patterns and purposes of use among the Saudi population.

MATERIALS AND METHODS

Study design and setting

This observational cross-sectional study was conducted across multiple regions of Saudi Arabia between July and December 2025. A structured questionnaire adapted from a previously validated instrument[9] was used, with additional sections incorporated to assess Saudi Arabian citizens' awareness, perceptions, and practices related to OTC medication use.

Participants, recruitment, and sampling procedure

Adults aged 18 years and older residing in Saudi Arabia, including both Saudi and non-Saudi nationals, were

recruited nationwide. Participants were enrolled through an online questionnaire distributed via social media platforms, including Twitter/X, Snapchat, Instagram, WhatsApp, and Facebook, during the study period from July to December 2025.

Sample size

The minimum required sample size for estimating a single population proportion was calculated using the formula:

$$n = Z^2 \times p(1-p)/d^2,$$

where Z was set at 1.96 to achieve a 95% confidence level, *P* was assumed to be 0.50 to maximize variability, and d was defined as 0.05 to represent the margin of error. Based on this calculation, the minimum sample size was 384 participants. Given the large target population, no finite population correction was applied. To account for incomplete or invalid responses and to ensure adequate data quality, a target of 400 completed questionnaires was set.

Inclusion and exclusion criteria

The inclusion criteria comprised adults aged 18 years or older who were currently residing in Saudi Arabia, of either sex, from all provinces of the Kingdom, with the ability to read, internet access, and willingness to provide informed consent. Exclusion criteria included individuals younger than 18 years, those not residing in Saudi Arabia at the time of the study, and healthcare professionals.

Data collection method and instrument

Data were collected using an online, self-administered questionnaire. The initial page of the survey provided a brief description of the study objectives, eligibility criteria, confidentiality assurances, and an electronic informed consent form. The questionnaire was adapted from a validated knowledge, attitude, and practice instrument, with additional items tailored to the Saudi context. The survey was available in both Arabic and English and required approximately 10–12 min to complete.

The questionnaire consisted of eight sections: Sociodemographic characteristics; knowledge about OTC medications (10 items with "True," "False," or "Not sure" response options); attitudes toward OTC medication use (11 Likert-scale items, including one related to social media influence); validated consumer behaviors related to self-medication; OTC safety and misuse behaviors (five items); reasons for self-medication; sources of medicines; and reported side effects. The survey link was distributed nationwide through social media platforms. Participation was voluntary and anonymous, and data quality was enhanced by implementing basic controls, including time-stamp verification and restriction to one submission per device.

Scoring system

Part I: Knowledge

Knowledge was assessed using 10 items with three response options ("True," "False," and "Not sure"). Correct responses were awarded one point, while incorrect and "Not sure" responses received zero points, resulting in a total score ranging from 0 to 10. Based on Bloom's cut-off criteria, knowledge levels were categorized as good (8–10; 80–100%), moderate (6–7; 60–79%), and poor (≤5; <60%).

Part II: Attitude

Attitude toward OTC medication use was assessed using 11 statements rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Total attitude scores ranged from 11 to 55 and were classified according to Bloom's cut-off as positive (44–55; 80–100%), neutral (33–43; 60–79%), or negative (11–32; <60%).

Part III: Consumer behaviors

Consumer behaviors related to self-medication were analyzed individually in accordance with the validated instrument. This section included 10 items with mixed response formats, including frequency scales, single-choice, yes/no, and multiple-response questions. Frequency responses were coded as always = 4, often = 3, sometimes = 2, rarely = 1, and never = 0. Yes/no items were coded as 1 and 0, respectively, while multi-select responses were coded as selected (1) or not selected (0). No composite behavior score was calculated.

Part IV: OTC safety and misuse behaviors

OTC safety and misuse behaviors were assessed using five frequency-based items scored as never = 0, sometimes = 1, and always = 2. Two items reflecting safe practices (proper storage and disposal of spoiled medicines) were reverse-coded so that higher total scores indicated riskier behavior. The summed risk score ranged from 0 to 10 and was categorized using reverse Bloom's cut-off as low risk (0–2), moderate risk (3–7), or high risk (8–10).

Other sections

Reasons for self-medication and sources of medicines were recorded as multiple-response variables and reported descriptively. Derived indicators, such as the number of reasons for self-medication and use of non-pharmacy sources, were included in the analysis. Side effects were assessed using a dichotomous variable indicating the presence of any adverse effect, a checklist of specific adverse effects, and a 5-point concern scale ranging from not concerned at all (1) to very concerned (5).

Pilot testing

A pilot test was conducted among 20 participants to assess the clarity, feasibility, and ease of use of the questionnaire. Data obtained from the pilot study were excluded from the final analysis.

Data entry and statistical analysis

Data were entered into Microsoft Office Excel (2016) for Windows and subsequently imported into IBM SPSS Statistics for Windows (Version 25.0; IBM Corp., Armonk, NY, USA) for statistical analysis. Descriptive and inferential statistical analyses were performed as appropriate.

RESULTS

Table 1 displays various demographic parameters of the participants with a total number of 472. The average age was 34.1 ± 12.4 years, and the highest percentage (30.1) was in the age group of 31–44 years. A total of 56.4% were females. Most of the respondents were Saudi citizens (93.4%), and they were living in Western region (63.8%). Most of them had a bachelor's degree (66.3) and were working (42.8%), and 25% were learners. Nearly half were married (48.1%). Over 50% of them indicated no health insurance (59.5%). Most of the participants reported no health-related background (87.3%), as well as no chronic disease (69.7%), with some of them having overlapping conditions.

As shown in Figure 1, 36.2% preferred OTC medications for self-medication, followed by 25.0% for prescription-only medicines, 23.3% for home remedies, and 15.5% for traditional medicine.

Table 2 shows that there was high knowledge on self-medication and use of OTC drugs. Accurate self-medication

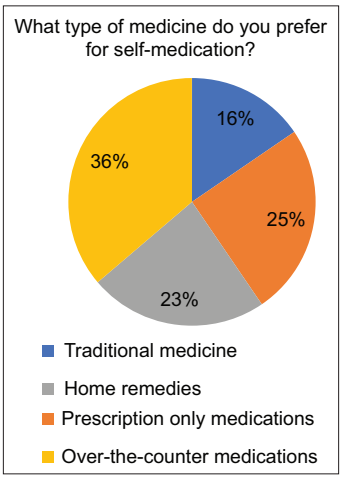

Figure 1: Illustrates type of medicine preferred for self-medication among participants

Table 1: Sociodemographic characteristics of participants (*n*=472)

Parameter	No.	Percentage
Age (Mean: 34.1, standard deviation: 12.4)		
23 or less	124	26.3
24–30	97	20.6
31–44	142	30.1
45 or more	109	23.1
Gender		
Female	266	56.4
Male	206	43.6
Nationality		
Saudi	441	93.4
Non-Saudi	31	6.6
Residential region		
Northern region	14	3.0
Southern region	19	4.0
Central region	103	21.8
Eastern region	35	7.4
Western region	301	63.8
Educational level		
Elementary	4	0.8
Intermediate	8	1.7
Secondary	95	20.1
Bachelor's	313	66.3
Postgraduate	51	10.8
No educational qualification	1	0.2
Occupation		
Student	118	25.0
Employee	202	42.8
Freelancer	31	6.6
Unemployed	96	20.3
Retired	25	5.3
Family monthly income		
<5,000 Saudi Riyals	62	13.1
From 5,000 to 9,999 Saudi Riyals	97	20.6
From 10,000 to 14,999 Saudi Riyals	94	19.9
From 15,000 to 19,999 Saudi Riyals	94	19.9
From 20,000 to 29,999 Saudi Riyals	55	11.7
From 30,000 Saudi Riyals or more	70	14.8
Marital status		
Single	224	47.5
Married	227	48.1
Divorced	16	3.4
Widowed	5	1.1
Do you currently have health insurance coverage?		
No	281	59.5

(Contd...)

Table 1: *(Continued)*

Parameter	No.	Percentage
Yes	191	40.5
Which best describes your background?		
I am a student in a health-related field (medicine, pharmacy, nursing, etc.)	60	12.7
I have no health background.	412	87.3
Has a doctor ever told you that you have any chronic disease?*		
None	329	69.7
Diabetes	38	8.05
Hypertension	19	4.03
Heart disease (e.g., CAD)	8	1.69
Asthma/COPD	12	2.54
Gastro-intestinal disorder (e.g., GERD)	31	6.57
Rheumatologic condition	7	1.48
Other	73	15.47

*Results may overlap. CAD: Coronary artery disease, GERD: Gastroesophageal reflux disease, COPD: Chronic obstructive pulmonary disease

concepts identification was between 68.2 and 71.6%. Majority of the respondents were aware that a prescription is necessary when purchasing medicines (93.6%) and taking prescription drugs without a doctor (prescription drugs) can result in complications (93.9%). The necessity to read medication leaflets (95.3%), as well as to check expiry dates (99.6%), was generally accepted. Moreover, the awareness of self-medication effects on adverse drug reaction or dependence was 92.8%, and 86.7% were aware of the consequences of self-medication in drug resistance, which shows satisfactory levels of knowledge.

As shown in Figure 2, 34.3% disagreed or strongly disagreed that self-medication is a good practice, 43.0% were neutral, and 22.7% agreed or strongly agreed

Table 3 demonstrates the ambivalent attitudes to taking OTC medication. Almost 50% of respondents were neutral about self-medication as a general practice (43.0%), and a smaller proportion (22.7%) agreed or strongly agreed. Taking up old medicines was disapproved by 45.8 and 27.5 accepted. Most of them held that it was good to treat some ailments without seeing a doctor (59.9%) and believed that it was convenient (32.9%). The use of similar conditions to reuse the same medicines was accepted by 36.9%. There was a great popularity of self-medication of minor diseases (66.3%), and 52.5% of the respondents thought that pharmacists can treat certain illnesses. On the other hand, the level of distrust towards the information provided by social media was high (64.9%).

Table 4 records the self-medication habits, the safety habits, the triggers, and the source of OTC medicines. Most of the participants self-medicated occasionally or frequently

Table 2: Parameters related to knowledge regarding over-the-counter medication usage (*n*=472)

Parameter	No.	Percentage
Self-medication (SM) is taking medicine to treat an illness on one's initiative or at another person's suggestion without consulting a physician		
False	139	29.4
True	333	70.6
Using old prescriptions to manage a recurring disease or illness is SM		
False	134	28.4
True	338	71.6
SM is taking leftover medicines from a previously diagnosed illness to treat a recurrent one		
False	150	31.8
True	322	68.2
A prescription from a doctor is essential before buying any medicine		
False	30	6.4
True	442	93.6
It is possible to treat minor illnesses with SM correctly		
False	81	17.2
True	391	82.8
Taking prescription medications without a doctor's prescription can lead to complications		
False	29	6.1
True	443	93.9
The reading and understanding of leaflets in the drug pack is essential before taking medicine		
False	22	4.7
True	450	95.3
Checking the expiry date of medicine is essential before taking any medication		
False	2	0.4
True	470	99.6
SM can cause drug dependence/adverse drug reactions		
False	34	7.2
True	438	92.8
SM can cause drug resistance		
False	63	13.3
True	409	86.7

(68.5%), and OTC drugs were the most preferred ones (36.2%). The most notable causes of not seeing a doctor were prior experience (50.6) and time absence (48.1), whereas the prevalent causes of self-medication included mild symptoms (66.7%). Dose determination was usually done in consultation with pharmacists (72.3%), and most of the participants followed the prescribed doses (96.4%). Though most respondents (70.1) used community pharmacies to acquire medicines, safe practice, like adequate storage (75.4)

Table 3: Participants' attitude regarding over-the-counter medication usage (*n*=472)

Parameter	No.	Percentage
Self-medication is a good practice for the prevention and treatment of illnesses		
Strongly disagree	76	16.1
Disagree	86	18.2
Neutral	203	43.0
Agree	91	19.3
Strongly agree	16	3.4
When I fall sick, there is nothing wrong with using leftover medicines to treat myself		
Strongly disagree	125	26.5
Disagree	91	19.3
Neutral	126	26.7
Agree	111	23.5
Strongly agree	19	4.0
Some ailments can be treated at home by purchasing medicine from a pharmacy without consulting a doctor		
Strongly disagree	38	8.1
Disagree	36	7.6
Neutral	115	24.4
Agree	246	52.1
Strongly agree	37	7.8
It is convenient to purchase medicines directly from a pharmacist without consulting a doctor		
Strongly disagree	71	15.0
Disagree	86	18.2
Neutral	160	33.9
Agree	133	28.2
Strongly agree	22	4.7
When the condition is similar to a previous illness, I can use the same medicine again without consulting a doctor		
Strongly disagree	69	14.6
Disagree	111	23.5
Neutral	118	25.0
Agree	150	31.8
Strongly agree	24	5.1
I am always willing to take medicine for treatment when someone I trust recommends it		
Strongly disagree	121	25.6
Disagree	161	34.1
Neutral	104	22.0
Agree	81	17.2
Strongly agree	5	1.1
Consulting a doctor is only necessary when the illness is severe		
Strongly disagree	57	12.1
Disagree	125	26.5
Neutral	66	14.0
Agree	119	25.2
Strongly agree	105	22.2
Taking medicines without consulting a doctor can save the time and money spent on doctor's visits and consultations		
Strongly disagree	99	21.0
Disagree	114	24.2
Neutral	72	15.3
Agree	149	31.6
Strongly agree	38	8.1
Self-medication is preferable when the illness is minor/the symptoms are not severe		
Strongly disagree	26	5.5
Disagree	33	7.0
Neutral	100	21.2
Agree	226	47.9
Strongly agree	87	18.4
I believe the pharmacist can handle some of the ailments, and there is no need to consult a doctor		
Strongly disagree	32	6.8
Disagree	69	14.6
Neutral	123	26.1
Agree	203	43.0
Strongly agree	45	9.5
I trust information about medicines that I see on social-media platforms		
Strongly disagree	157	33.3
Disagree	149	31.6
Neutral	116	24.6
Agree	38	8.1
Strongly agree	12	2.5

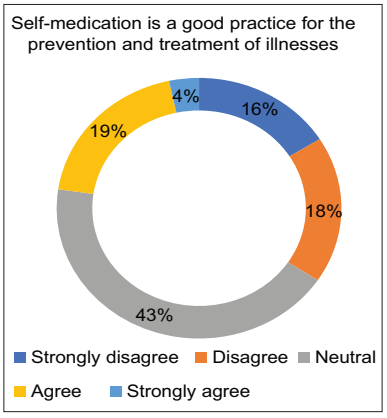

Figure 2: Illustrates whether self-medication is good for prevention among participants

Table 4: Participants' OTC safety, behaviors, reasons, and sources of medications (*n*=472)

Parameter	No.	Percentage
How frequently do you practice SM when you suffer from any illness?		
Always	36	7.6
Often	108	22.9
Sometimes	215	45.6
Rarely	97	20.6
Never	16	3.4
What type of medicine do you prefer for self-medication?		
Traditional medicine	73	15.5
Prescription only medications	118	25.0
Home remedies	110	23.3
Over-the-counter medications	171	36.2
What is/are the reasons for not consulting a doctor before taking any medicine?*		
Lack of time	227	48.09
Previous prescriptions	150	31.78
Financial constraints	145	30.72
Pressure from family-friends	26	5.51
Prior experience	239	50.64
Social stigma	26	5.51
What is your perception about your current health status?		
Excellent	142	30.1
Very good	166	35.2
Good	118	25.0
Acceptable	30	6.4
Poor	16	3.4
What information are you interested in while buying any medicine from the pharmacy?*		
Price	153	32.42
How to take it	246	52.12
Intended effects	272	57.63
Side-effects–adverse reactions	317	67.16
Active AND inert ingredients	116	24.58
Do you take the medicine based on the recommended dosage?		
No	17	3.6
Yes	455	96.4
How do you determine the dose for self-medication?*		
Checking the package	206	43.64
Consulting a pharmacist	341	72.25
Consulting family/friends	66	13.98
Previous experience	162	34.32
Guessing the dosage	20	4.24
Do you check the expiry date before buying any medicine?		
Always	228	48.3
Often	93	19.7
Sometimes	87	18.4
Rarely	25	5.3
Never	39	8.3
When you purchase any medicine, do you read the package insert?		
Always	169	35.8
Often	114	24.2
Sometimes	106	22.5
Rarely	55	11.7
Never	28	5.9
I share medicines with friends or family members		
Always	32	6.8
Sometimes	250	53.0
Never	190	40.3
I exceed the recommended dose of a medicine		
Always	6	1.3
Sometimes	68	14.4
Never	398	84.3
I store medicines in a properly sealed medicine box		
Always	356	75.4
Sometimes	90	19.1
Never	26	5.5
I discard medicines if their color, shape, or smell has changed		
Always	400	84.7
Sometimes	53	11.2
Never	19	4.0
I use anti-allergy medicines for purposes other than allergy treatment (e.g., to help with sleep)		
Always	23	4.9
Sometimes	112	23.7
Never	337	71.4
Reasons for self-medication		
Difficulty accessing a healthcare facility	124	26.27
Long waiting times at clinics/ hospitals	272	57.63
No health insurance/cost concerns	171	36.23
Mild symptoms/not serious illness	315	66.74
Previous successful experience with the medicine	243	51.48
Recommendation from friends or family	71	15.04
Time-saving/busy schedule	170	36.02

(Contd...)

Table 4: *(Continued)*

Parameter	No.	Percentage
I do not like visiting doctors	133	28.18
Other	37	7.84
Sources of medicines		
Community pharmacy without prescription	331	70.13
Leftover medicines at home	229	48.52
Friends or relatives	53	11.23
Online purchase (e.g., licensed e-pharmacy/app)	64	13.56
Herbal/traditional healer	117	24.79
Other	43	9.11
Have you ever experienced side effects after taking medicine without a prescription?		
Yes	64	13.6
No	293	62.1
Not sure	115	24.4
If yes, which side-effects did you experience? (*n*=64)		
Upset stomach/indigestion	28	5.93
Nausea or vomiting	21	4.45
Heartburn/acid reflux	11	2.33
Diarrhea	20	4.24
Constipation	9	1.91
Swelling of face/lips/eyes	3	0.64
Shortness of breath/wheezing	6	1.27
Dizziness or light-headedness	20	4.24
Headache	17	3.60
Skin rash or itching	14	2.97
Other	6	1.27
Are you concerned about the potential long-term side effects of using medicines without medical guidance?		
Very concerned	106	22.5
Somewhat concerned	150	31.8
Neutral	105	22.2
Slightly concerned	71	15.0
Not concerned at all	40	8.5

*Results may overlap

and disposal of expired medicines (84.7) were reported, though there were instances of medicine sharing.

Table 5 shows that most participants demonstrated high knowledge about OTC medication usage (75.8%), while 21.6% had moderate knowledge and only 2.5% showed low awareness.

Table 6 shows low awareness attitudes toward OTC medication use, with 47.5% showing low levels, 46.8% moderate levels, and only 5.7% showing high attitude scores.

Table 5: Knowledge about over-the-counter medication usage score results

Knowledge level	Frequency	Percentage
High knowledge level	358	75.8
Moderate knowledge level	102	21.6
Low knowledge level	12	2.5
Total	472	100.0

Table 6: Awareness about over-the-counter medication usage score results

Awareness level	Frequency	Percentage
High attitude level	27	5.7
Moderate attitude level	221	46.8
Low attitude level	224	47.5
Total	472	100.0

Table 7: Risk level and safety regarding over-the-counter medication usage score results

Risk level	Frequency	Percentage
High risk level	6	1.3
Moderate risk level	443	93.9
Low risk level	23	4.9
Total	472	100.0

Table 7 shows that most participants had a moderate risk level regarding OTC medication safety (93.9%), while few exhibited low risk (4.9%) or high risk (1.3%) levels.

Table 8 shows that knowledge about OTC medication usage has a statistically significant relation to gender ($P = 0.015$), family monthly income ($P = 0.030$), and marital status ($P = 0.030$).

Table 9 shows that attitude level regarding OTC medication usage has a statistically insignificant relation to gender, age, nationality, residential region, educational level, occupation, family monthly income, marital status, and health insurance coverage.

Table 10 shows that safety and misuse level regarding OTC medication usage has a statistically significant relation to age ($P = 0.004$), residential region ($P = 0.007$), occupation ($P = 0.006$), family monthly income ($P = 0.037$), and having health insurance (0.041). It also shows a statistically insignificant relation to gender, nationality, educational level, and marital status.

DISCUSSION

The aim of the current study was to assess the extent of people's awareness about OTC medications and to describe

Table 8: Relation between knowledge about over-the-counter medication usage and sociodemographic characteristics

Parameters	Knowledge level		Total (*n*=472)	*P*-value
	High knowledge level	Moderate or low knowledge		
Gender				
Female	213	53	266	0.015*
	59.5%	46.5%	56.4%	
Male	145	61	206	
	40.5%	53.5%	43.6%	
Age				
23 or less	97	27	124	0.598
	27.1%	23.7%	26.3%	
24–30	70	27	97	
	19.6%	23.7%	20.6%	
31–44	111	31	142	
	31.0%	27.2%	30.1%	
45 or more	80	29	109	
	22.3%	25.4%	23.1%	
Nationality				
Saudi	336	105	441	0.511
	93.9%	92.1%	93.4%	
Non-Saudi	22	9	31	
	6.1%	7.9%	6.6%	
Residential region				
Northern region	12	2	14	0.760
	3.4%	1.8%	3.0%	
Southern region	15	4	19	
	4.2%	3.5%	4.0%	
Central region	75	28	103	
	20.9%	24.6%	21.8%	
Eastern region	25	10	35	
	7.0%	8.8%	7.4%	
Western region	231	70	301	
	64.5%	61.4%	63.8%	
Educational level				
Elementary	2	2	4	0.322
	0.6%	1.8%	0.8%	
Intermediate	7	1	8	
	2.0%	0.9%	1.7%	
Secondary	67	28	95	
	18.7%	24.6%	20.1%	
Bachelor's	238	75	313	
	66.5%	65.8%	66.3%	
Postgraduate	43	8	51	
	12.0%	7.0%	10.8%	
No educational qualification	1	0	1	
	0.3%	0.0%	0.2%	

(Contd...)

Table 8: *(Continued)*

Parameters	Knowledge level		Total (*n*=472)	*P*-value
	High knowledge level	Moderate or low knowledge		
Occupation				
Student	93	25	118	0.554
	26.0%	21.9%	25.0%	
Employee	153	49	202	
	42.7%	43.0%	42.8%	
Freelancer	20	11	31	
	5.6%	9.6%	6.6%	
Unemployed	74	22	96	
	20.7%	19.3%	20.3%	
Retired	18	7	25	
	5.0%	6.1%	5.3%	
Family monthly income				
<5,000 Saudi Riyals	40	22	62	0.030*
	11.2%	19.3%	13.1%	
From 5,000 to 9,999 Saudi Riyals	78	19	97	
	21.8%	16.7%	20.6%	
From 10,000 to 14,999 Saudi Riyals	73	21	94	
	20.4%	18.4%	19.9%	
From 15,000 to 19,999 Saudi Riyals	66	28	94	
	18.4%	24.6%	19.9%	
From 20,000 to 29,999 Saudi Riyals	40	15	55	
	11.2%	13.2%	11.7%	
From 30,000 Saudi Riyals or more	61	9	70	
	17.0%	7.9%	14.8%	
Marital status				
Single	174	50	224	0.030*
	48.6%	43.9%	47.5%	
Married	171	56	227	
	47.8%	49.1%	48.1%	
Divorced	12	4	16	
	3.4%	3.5%	3.4%	
Widowed	1	4	5	
	0.3%	3.5%	1.1%	
Do you currently have health insurance coverage?				
No	214	67	281	0.849
	59.8%	58.8%	59.5%	
Yes	144	47	191	
	40.2%	41.2%	40.5%	

**P*-value was considered significant if ≤ 0.05

the patterns and indications for using OTC medications among the adults residing in Saudi Arabia. This cross-sectional survey of 472 participants provided much about the awareness, attitudes, and practices of behavior related to OTC medication use, which would be well done in comparison with existing literature and discussion of methodological considerations.

The demographic characteristics of the study participants (mean age 34.1 + −12.4 years, females 56.4%, Saudi nationals

Table 9: Attitude level regarding over-the-counter medication usage in association with sociodemographic characteristics

Parameters	Attitude level		Total (*n*=472)	*P*-value
	High or moderate attitude	Low attitude level		
Gender				
Female	138	128	266	0.743
	55.6%	57.1%	56.4%	
Male	110	96	206	
	44.4%	42.9%	43.6%	
Age				
23 or less	72	52	124	0.451
	29.0%	23.2%	26.3%	
24–30	52	45	97	
	21.0%	20.1%	20.6%	
31–44	69	73	142	
	27.8%	32.6%	30.1%	
45 or more	55	54	109	
	22.2%	24.1%	23.1%	
Nationality				
Saudi	236	205	441	0.111
	95.2%	91.5%	93.4%	
Non-Saudi	12	19	31	
	4.8%	8.5%	6.6%	
Residential region				
Northern region	7	7	14	0.197
	2.8%	3.1%	3.0%	
Southern region	10	9	19	
	4.0%	4.0%	4.0%	
Central region	45	58	103	
	18.1%	25.9%	21.8%	
Eastern region	23	12	35	
	9.3%	5.4%	7.4%	
Western region	163	138	301	
	65.7%	61.6%	63.8%	
Educational level				
Elementary	2	2	4	0.088
	0.8%	0.9%	0.8%	
Intermediate	3	5	8	
	1.2%	2.2%	1.7%	
Secondary	42	53	95	
	16.9%	23.7%	20.1%	
Bachelor's	165	148	313	
	66.5%	66.1%	66.3%	
Postgraduate	35	16	51	
	14.1%	7.1%	10.8%	
No educational qualification	1	0	1	
	0.4%	0.0%	0.2%	

(Contd...)

Table 9: *(Continued)*

Parameters	Attitude level		Total (*n*=472)	*P*-value
	High or moderate attitude	Low attitude level		
Occupation				
Student	67	51	118	0.454
	27.0%	22.8%	25.0%	
Employee	109	93	202	
	44.0%	41.5%	42.8%	
Freelancer	15	16	31	
	6.0%	7.1%	6.6%	
Unemployed	43	53	96	
	17.3%	23.7%	20.3%	
Retired	14	11	25	
	5.6%	4.9%	5.3%	
Family monthly income				
<5,000 Saudi Riyals	30	32	62	0.548
	12.1%	14.3%	13.1%	
From 5,000 to 9,999 Saudi Riyals	45	52	97	
	18.1%	23.2%	20.6%	
From 10,000 to 14,999 Saudi Riyals	51	43	94	
	20.6%	19.2%	19.9%	
From 15,000 to 19,999 Saudi Riyals	50	44	94	
	20.2%	19.6%	19.9%	
From 20,000 to 29,999 Saudi Riyals	34	21	55	
	13.7%	9.4%	11.7%	
From 30,000 Saudi Riyals or more	38	32	70	
	15.3%	14.3%	14.8%	
Marital status				
Single	123	101	224	0.147
	49.6%	45.1%	47.5%	
Married	110	117	227	
	44.4%	52.2%	48.1%	
Divorced	12	4	16	
	4.8%	1.8%	3.4%	
Widowed	3	2	5	
	1.2%	0.9%	1.1%	
Do you currently have health insurance coverage?				
No	147	134	281	0.904
	59.3%	59.8%	59.5%	
Yes	101	90	191	
	40.7%	40.2%	40.5%	

**P*-value was considered significant if ≤ 0.05

predominantly 93.4%) correlate with similar descriptive surveys carried out in the Kingdom of Saudi Arabia and are representative of the general population of adults. The high educational attainment among this cohort (66.3% with bachelor's degree) is consistent with national trends in healthcare awareness studies, and may affect knowledge and practice patterns about the use of medications.[10]

With regards to preferences on OTC medication, the present study noted that 36.2% of respondents favored

Table 10: Safety and misuse level regarding over-the-counter medication usage in association with sociodemographic characteristics

Parameters	Safety and misuse level		Total (*n*=472)	*P*-value
	High or moderate risk	Low risk level		
Gender				
Female	251	15	266	0.380
	55.9%	65.2%	56.4%	
Male	198	8	206	
	44.1%	34.8%	43.6%	
Age				
23 or less	120	4	124	0.004
	26.7%	17.4%	26.3%	
24–30	86	11	97	
	19.2%	47.8%	20.6%	
31–44	135	7	142	
	30.1%	30.4%	30.1%	
45 or more	108	1	109	
	24.1%	4.3%	23.1%	
Nationality				
Saudi	419	22	441	0.659
	93.3%	95.7%	93.4%	
Non-Saudi	30	1	31	
	6.7%	4.3%	6.6%	
Residential region				
Northern region	14	0	14	0.007
	3.1%	0.0%	3.0%	
Southern region	15	4	19	
	3.3%	17.4%	4.0%	
Central region	100	3	103	
	22.3%	13.0%	21.8%	
Eastern region	35	0	35	
	7.8%	0.0%	7.4%	
Western region	285	16	301	
	63.5%	69.6%	63.8%	
Educational level				
Elementary	4	0	4	0.094
	0.9%	0.0%	0.8%	
Intermediate	8	0	8	
	1.8%	0.0%	1.7%	
Secondary	94	1	95	
	20.9%	4.3%	20.1%	
Bachelor's	291	22	313	
	64.8%	95.7%	66.3%	
Postgraduate	51	0	51	
	11.4%	0.0%	10.8%	
No educational qualification	1	0	1	
	0.2%	0.0%	0.2%	

(Contd...)

Table 10: *(Continued)*

Parameters	Safety and misuse level		Total (*n*=472)	*P*-value
	High or moderate risk	Low risk level		
Occupation				
Student	115	3	118	0.006
	25.6%	13.0%	25.0%	
Employee	195	7	202	
	43.4%	30.4%	42.8%	
Freelancer	26	5	31	
	5.8%	21.7%	6.6%	
Unemployed	88	8	96	
	19.6%	34.8%	20.3%	
Retired	25	0	25	
	5.6%	0.0%	5.3%	
Family monthly income				
<5,000 Saudi Riyals	61	1	62	0.037
	13.6%	4.3%	13.1%	
From 5,000 to 9,999 Saudi Riyals	89	8	97	
	19.8%	34.8%	20.6%	
From 10,000 to 14,999 Saudi Riyals	93	1	94	
	20.7%	4.3%	19.9%	
From 15,000 to 19,999 Saudi Riyals	89	5	94	
	19.8%	21.7%	19.9%	
From 20,000 to 29,999 Saudi Riyals	54	1	55	
	12.0%	4.3%	11.7%	
From 30,000 Saudi Riyals or more	63	7	70	
	14.0%	30.4%	14.8%	
Marital status				
Single	213	11	224	0.763
	47.4%	47.8%	47.5%	
Married	215	12	227	
	47.9%	52.2%	48.1%	
Divorced	16	0	16	
	3.6%	0.0%	3.4%	
Widowed	5	0	5	
	1.1%	0.0%	1.1%	
Do you currently have health insurance coverage?				
No	272	9	281	0.041
	60.6%	39.1%	59.5%	
Yes	177	14	191	
	39.4%	60.9%	40.5%	

**P*-value was considered significant if ≤0.05

over-the-counter medications for self-medication, followed by 25.0% of respondents favoring prescription-only medicines, 23.3% of respondents favoring home remedies, and 15.5% of respondents favoring traditional medicine. This pattern of OTC preference is in line with a cross-sectional study of 611 Riyadh residents in which the prevalence of self-medication was 52.9% within a 3-month period, with most of these individuals using pharmacy stores as their source of the drug (89.2%).[11] The preference for OTC medications in the present study implies a rational method of self-care for

minor ailments, as OTC drugs could generally be considered as safe and effective for use by the general public without the supervision of a professional.[12] Of note, the 36.2% preference for OTC medications among our cohort is a conscious choice of accessible, regulated pharmaceutical options in favor of unregulated remedies.

Regarding perceptions on self-medication practices, this study found complex views on the acceptability of OTC usage. A significant percentage (43.0%) of the participants had a neutral position regarding the statement that self-medication for prevention and treatment is a good practice, and 22.7% (19.3% agree + 3.4% strongly agree) supported it. This finding is similar to those reported in other studies conducted in Saudi Arabia, where populations showed varying views with regards to the safety of self-medication.[11] The seemingly reluctant admission to condone self-medication in this regard, despite its documented prevalence, is suggestive of a changing public conscience about the possible risks. Further, 52.1% of participants agreed that some ailments could be treated at home by buying the medicine from a pharmacy without consulting a doctor, which is a pragmatic admission of the role of OTC medications in the management of minor, self-limited health conditions. This attitude is supported by the WHO recommendations on the use of OTC drugs, which state that rational self-medication is acceptable for minor, self-limiting illnesses.[13]

The competency of the pharmacist in this study was a significant attitude variable, as shown by the results that 52.5% (43.0% + 9.5%) agreed or strongly agreed that the pharmacist can deal with some ailments without the need for physician consultation. This finding is consistent with previous literature from Saudi Arabia that found that pharmacists are an accessible source of medication information for the general population.[11] However, this increased confidence in pharmacist-led care should be interpreted cautiously because although pharmaceutical counseling is of value, it is not a replacement for clinical evaluation within a few conditions where differential diagnosis and investigation are necessary. Community pharmacists play an important role in OTC medication access as well as consumer education based on several studies in the Middle East and internationally.[14]

A critical finding in the present study was the relative low level of trust in social media information about medicines, as 64.9% (33.3% strongly disagree + 31.6% disagree) expressed skepticism in medicines advertised on social media platforms. This protective attitude is promising and suggests the public is aware of the risks of misinformation in the digital world. Previous studies in Saudi Arabia and other parts of the world have found fluctuating amounts of skepticism about social media health information.[11] The finding indicates that despite health information proliferation in digital format, a large proportion of the Saudi population continues to evaluate online sources critically, although public health messaging about media literacy is important.

Behavioral patterns for OTC medication usage in this cohort showed that 52.3% of the subjects (52.1% agree + 7.8% strongly agree) that certain ailments can be treated by self-medication, by buying drugs directly at a pharmacy without medical consultation. This is consistent with the understanding that, in a common sense, conditions with minor symptoms (headache, cough, fever) may not require physician evaluation. Epidemiological studies have shown that headache (64.8%), pain (35.4%), and fever/flu (31. 4%) are among the most prevalent indications for OTC drug use reported from developed and developing nations[11] suggesting that behavioral patterns are consistent with evidence-based rational self-care of minor illnesses.

Regarding the medication cost-benefit considerations, 39.7% of the participants (31.6% agree + 8.1% strongly agree) agreed with the idea that taking medicines without consulting a doctor can save time and money when it comes to physician consultations, and 45.2% (21.0% strongly disagree + 24.2% disagree) did not agree with the idea that taking medicines without consulting a doctor can save time and money when it comes to physician consultations. This divided opinion is a real conflict between accessibility in healthcare and clinical safety. Economic factors play a significant role in the behavior of seeking medications, especially in middle-income healthcare settings where out-of-pocket costs are high despite the provision of healthcare by the government.[15]

The behavioral practice of using leftover medications is one area that should receive particular attention, as 27.5% (23.5% agree + 4.0% strongly agree) supported the use of residual prescription medications for similar conditions without seeking re-consultation. Although this percentage is less than one third of the participants, it represents a potentially unsafe practice that is known to increase adverse drug events, treatment failures, and antibiotic resistance.[16] A population-based study in Saudi Arabia showed that significant proportions of self-medication patients reported adverse drug events.[15] The reuse of leftover medications without the benefit of a proper diagnosis creates several risks, such as incorrect dosage, drug-drug interactions, and the masking of a serious underlying condition that requires professional evaluation.

The knowledge dimension of OTC medication use, while not formally assessed through a comprehensive validated scale in the present study, was reflected in attitudinal measures. A recent cross-sectional study of 326 participants in Al-Ahsa, Saudi Arabia, found that only 11.96% demonstrated adequate knowledge regarding OTC medications, 56.44% had moderately adequate knowledge, and 31.6% exhibited inadequate understanding of appropriate OTC medication safety.[6] The present study's findings of predominantly neutral and agreeing responses suggest moderate knowledge prevalence, though formal assessment using validated instruments would be required to quantify this dimension precisely.

The study's limitations warrant explicit acknowledgment. First, the cross-sectional design permits only associations, not causal inference regarding factors influencing OTC use. Second, self-reported data is subject to social desirability bias, potentially affecting accuracy of behavioral and attitudinal responses. Third, the questionnaire, while undergoing pilot testing, was not formally validated through confirmatory factor analysis or comparison with established instruments. Fourth, the study population's geographic concentration may not fully represent all Saudi demographics, particularly rural populations where healthcare access differs substantially.

CONCLUSION

The present investigation demonstrates that awareness of OTC medications exists within the Saudi adult population, with approximately one-third preferring OTC agents for self-medication. Attitudes predominantly reflect rational perspectives on OTC use for minor ailments, with appropriate skepticism regarding unverified sources. However, continued emphasis on evidence-based patient education, community pharmacist-led medication counseling, structured health communication regarding medication safety, and reinforcement of appropriate thresholds for medical consultation remain essential public health priorities. The integration of OTC medication awareness into healthcare provider training and patient education programs would optimally balance the public health benefits of OTC accessibility with safety imperatives and prevention of irrational self-medication.

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ETHICAL APPROVAL

The study was fully explained to all participants, and it was emphasized that participation was voluntary. Written informed consent was obtained from each participant before enrollment. All collected information was securely stored and used exclusively for research purposes.

INFORMED CONSENT

Written informed consent was obtained from all study participants.

DATA AND MATERIALS AVAILABILITY

All data generated or analyzed during this study are included in this published article.

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