

# Self-medication practice among adults in Kingdom of Saudi Arabia

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## Abstract

**Introduction:** Self-medication (SM) is defined as drug utilization based on a patient's self-diagnosis, without consultation of any healthcare members. Despite being common among most communities, it carries a risk of medication errors. The current study aimed to assess the prevalence, awareness, and practices related to SM, including risky practices among adults in Kingdom of Saudi Arabia (KSA).

**Material and methods:** A cross-sectional survey-based study was conducted in Jeddah KSA. The sample size was 312 participants (as calculated by using the Epi-info CDC software calculator). They were recruited by volunteer sampling technique, through online propagation of a questionnaire, which was designed and assessed for validity and reliability. It was composed of 3 sections: demographics, assessment of awareness, and practices related to SM, including risky practices. Data were analysed using IBM SPSS-25.

**Results:** SM was practiced by 83% of the studied population. The prevalence of excellent, fair, and poor levels of awareness about SM were 12.4%, 45.6%, and 42%, respectively. Risky practices like using expired SMs, using SMs without checking expiry dates or without reading the instructions, using SMs during pregnancy or lactation, and continued use of SMs despite lack of improvement were identified among 5%, 12%, 39%, 11%, and 33% of participants, respectively.

**Conclusions:** An inappropriate level of awareness and a high prevalence of risky practices related to SM were identified among the studied sample of adults in KSA. It is critical to raise public awareness of SM to avoid SM-related health concerns.

**Key words:** self-medication, over the counter drugs, drug-related health hazards.

## Introduction

Self-medication (SM) is described as the utilization of drugs without consultation of a physician or a healthcare provider for the treatment of a self-diagnosed illness. The World Health Organization (WHO) defines it as “the process of medicating oneself to treat self-recognized disorders or illnesses” [1].

Treatment received by SM practice can include pharmacological or non-pharmacological measures, like herbs, acupuncture, behavioural

therapy, or modification of lifestyle. SM includes multiple behaviours, including self-care, disease prevention, and management [2].

This phenomenon represents a major worldwide public health concern. It is occurring increasingly in all countries, including developing and developed countries [3]. It can be considered a double-edged weapon, with both benefits and hazards. SM is a widespread practice all over the world because it is cheap, easy, and money- and time-saving, in addition to saving resources and decreasing the burden on healthcare facilities. On the other side, incorrect diagnosis, inappropriate drug selection, inaccurate dose, and erroneous timing of drug administration, among other numerous loose practices, can induce various hazards to the individual, healthcare facilities, and the entire community. SM can lead to serious consequences such as delay in diagnosis of illness, drug resistance, development of co-morbidities, and, in some cases, death [4]. Although SM practice was commonly preferred by patients in a trial to reduce the waste of time and money in visiting the appropriate healthcare facility, it can be a cause of major and sometimes critical health- and community-related problems [5].

Clinical pharmacists play a major role in the management of this major health issue. They represent the key role-players in patients' and consumers' education and counselling about the appropriate use of different medicines intended for self-medication [6, 7]. Pharmacists play a major role in identifying, solving, and preventing drug-related problems. They have the responsibility and opportunity to foster medication use in terms of safety, effectiveness, and suitability, particularly while dealing with therapies eligible for SM practice. Clinical pharmacists should differentiate and guide their patients to select between situations in which SM can be used and those in which patients should be referred to consult a physician. Additionally, information should be made available about appropriate storage and use of medications, in addition to their expiry [8].

The current study was conducted to assess the prevalence of self-medication, risky practice, benefits, and occurrence of complications from SM among adults in Kingdom of Saudi Arabia (KSA), as well as awareness of specific precautions for using some drugs.

## Material and methods

### Sample size

The study sample included 312 adults living in KSA.

### Inclusion criteria

Adults aged 18 to 60 years living in KSA.

### Exclusion criteria

Individuals with a language barrier, who were unable to communicate in English or Arabic were excluded.

### Study design

A descriptive survey-based, cross-sectional study was conducted in Jeddah City, Saudi Arabia, between December 2022 and March 2023, after obtaining ethical permission from the Research Ethics Committee, Fakeeh College for Medical Sciences, Jeddah, KSA.

### Study variables

SM is defined as the utilization of any drug (prescription or over-the-counter [OTC] drugs) without consultation of a physician or a healthcare provider for the treatment of a self-diagnosed illness.

Risky practice is defined as practicing SM during pregnancy or lactation, using it without counselling or checking instructions, using it after the expiry date or without checking the expiry date, or continuing to use OTC drugs or any SM despite a lack of improvement.

### Sampling design

Participants were recruited by online propagation of the questionnaire.

### Data collection tool

A questionnaire was designed and assessed for validity and reliability, composed of 3 parts: Part 1 assessed the demographic distribution of recruited cases; Part 2 assessed the awareness about self-medication, in which each question was answered with strongly disagree, disagree, I don't know, agree, or strongly agree, and received scores of 5, 4, 3, 2, and 1, respectively. The total score was calculated for each participant. The level of awareness for the participant was considered poor, moderate, or excellent if the achieved score was  $\leq 50\%$ ,  $50 \leq 80\%$ , or  $> 80\%$ , respectively. The sum of the response scores provided the baseline score. Responders' scores of less than or equal to 35% were considered poor. A score between 35% and 65% was considered fair, while a score greater than 65% was considered excellent. Lastly, the third part asked about the patient's SM and risky practices.

### Sampling technique

The participants were recruited by volunteer sampling technique. The online survey was distributed through various social networking packages, and the questionnaire was designed on Google Forms.

**Table I.** Demographics of participants and prevalence of SM practice

Parameter	Frequency	Percentage
Age:		
Valid		
18-<30	214	68.5
30-< 50	57	18.3
≥ 50	41	13.2
Total	312	100.0
Gender:		
Female	210	67.3
Male	102	32.7
Total	312	100.0
Level of education:		
Postgraduate studies	46	14.7
Graduate	129	41.3
Undergraduate	117	41.3
Total	312	100.0
Prevalence of SM practice:		
No	53	17.0
Yes	259	83.0
Total	312	100.0
Reasons for practicing SMS:		
When I can't visit doctor	34	10.9
When symptoms are minor	192	61.5
Whenever I feel sick	86	27.6
What are the advantages of SMs:		
Easy accessibility	104	33.3
Low cost	38	12.2
Safe and tolerable	82	26.3
Time saving	88	28.2
Total	312.0	100.0
Illnesses treated by self-medication:		
Allergy	13	4.2
analgesics	25	8.0
Constipation	8	2.6
Fever	10	3.2
Dermatological causes	32	10.3
vitamins	224	71.8
Total	312	100
Type of the medication used for SM:		
OTC drug	113	36.2
Prescription only medicine	38	12.2
Both	161	51.6
Total	312	100.0
Source of information about self-treatment:		
No counselling	11	3.5
Doctor	50	16.0
Pharmacist	159	51.0
Friend	38	12.2
I haven't used SM	54	17.3
Total	312	100.0

## Statistical analysis

The data were analysed statistically using Statistical Package for Social Sciences (SPSS) software (version 25, SPSS Inc., Chicago, IL). Descriptive statistics were done and presented in the form of both sample counts and percentages. The  $\chi^2$  test was employed to analyse the relationship between various variables, and a *p*-value of 0.05 or less was considered statistically significant.

## Results

The study included 312 participants living in Jeddah City, Saudi Arabia. Most of the participants were female (67.3%); males represented 32.7%. Age distribution showed that the most common age group among participants was 18 to < 30 years, (representing 66.3% of participants). Those aged between 30 and < 50 years represented 18.3% of participants.

The 2 most common levels of education of the studied population were faculty and high school levels, each of which represented (41.3%) of the total sample. Among the participants, 83% were practicing self-medication, and 17% were not practicing self-medication.

The most common reason for using SM was when symptoms were minor (62%) and when there was difficulty in visiting the physician. Ten per cent of the population mentioned that they used SM whenever they were sick.

Most participants thought that SM has the advantage of being an easily accessible (33%), safe, and tolerable method of therapy (27%), which is time saving (28%) and low cost (11%).

Among the tested sample, 72% were practicing self-treatment by taking multivitamins, 10% were using them for dermatological causes, 8% for analgesic effect, and the remaining 10% were due to allergy, constipation, or fever.

The participants who practiced SM (258 participants) were asked who counselled them about the drug they used, and 62% responded that they received the information from a pharmacist, 19% received previous information from a physician, 15% selected the drug based on a friend's advice, and 4% used their own knowledge (Table I).

A minimal, statistically insignificant difference was identified between the prevalence of SM practice between males and females (82.4% of female participants were practicing self-medication in comparison to 84.3% of males), and also among different age groups (Tables II and III).

All participants with a postgraduate level of education were practicing self-medication. The prevalence of SM among graduates and undergraduates was 82.9% and 73.5%, respectively (Table IV).

The association between different demographic data and SM practice was tested using the

**Table II.** Two-way table showing the prevalence of SM among males and females

Gender * SM practices crosstabulation			SM practice		Total	P-value
			Yes	No		
Gender	Male	Count	86	16	102	0.67
		% within gender	84.3%	15.7%	100.0%	
		% within SM practice	33.2%	30.2%	32.7%	
	Female	Count	173	37	210	
		% within gender	82.4%	17.6%	100.0%	
		% within SM practice	66.8%	69.8%	67.3%	
Total	Count	259	53	312		
	% within gender	83.0%	17.0%	100.0%		
	% within SM practice	100.0%	100.0%	100.0%		

**Table III.** Two-way table showing the prevalence of SM among different age groups

Age * SM practice crosstabulation		SM practice		Total	P-value
		Yes	No		
Age [years]	18-< 30	175	39	214	0.568975
	% within the age group	81.8%	18.2%		
	30-< 50	50	7	57	
	% within the age group	87.7%	12.3%		
	≥ 50	34	7	41	
	% within the age group	82.9%	17.1%		
Total		259	53	312	

**Table IV.** Two-way table showing the prevalence of SM among participants with different levels of education (\*statistically significant difference)

Highest level of education: * SM practices crosstabulation			SM practice		Total	P-value
			Yes	No		
Highest level of education:	Graduate	Count	107	22	129	0.000105*
		% within the group	82.9%	17.1%	100.0%	
	Undergraduate	Count	86	31	117	
		% within the group	73.5%	26.5%	100.0%	
	Postgraduate studies	Count	66	0	66	
		% within the group	100.0%	0.0%	100.0%	
Total		259	53	312		

$\chi^2$  test, which revealed that the level of education had a significant effect on the prevalence of SM practices (Table II–IV).

For assessment of the level of awareness about self-treatment, participants were asked the questions shown in Table V with the percentage of responses.

For assessment of the level of answers of strongly disagree, disagree, I don't know, agree, and strongly agree, received scores of 5, 4, 3, 2, and 1, respectively.

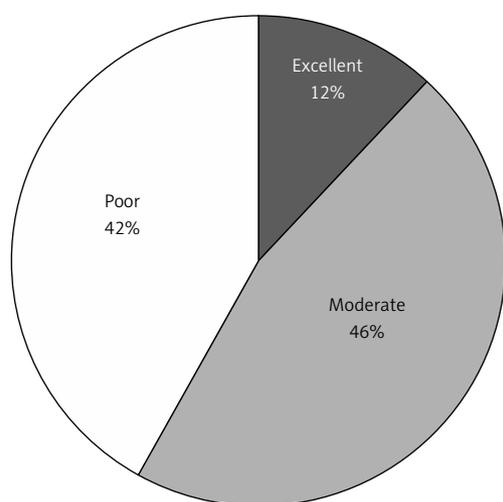
The total score was calculated, and the participants' score/total score was found to be 71.1%. This denotes that the overall level of awareness about the appropriate use of SM was fair. The to-

tal score for each participant was calculated using the same scoring system. This revealed that only 12.4% showed an excellent level of awareness, 45.6% showed fair knowledge, and 42% showed poor knowledge (Figure 1).

On the assessment of practices related to SM and the prevalence of risky practices, 5% of the participants were using SM even if they had expired, and 7% were sometimes using expired SM. Moreover, 12% of participants were using SMs without checking expiry dates, and 27% were sometimes using SM without checking the expiry dates. Thirty-nine percent of the participants used SM without reading the instructions, 33% read them sometimes, and 28% of them read the

**Table V.** Assessment of the level of awareness about SMs

Variable	Strongly agree % (n)	Agree	I don't know	Disagree	Strongly disagree
Do you think OTC drugs are completely safe for self-medication?	0% (0)	27.6% (86)	16.3% (51)	41.3% (129)	14.7% (46)
Do you think OTC drugs are completely safe during pregnancy and lactation?	2.5% (8)	9% (28)	14.7% (46)	18.6% (58)	55.1% (172)
Do you think taking any painkiller on an empty stomach is safe?	38.8% (121)	19.2% (60)	26.3% (82)	8.6% (27)	7.1% (22)
Do you think OTC drugs are not affected by storage?	6.1% (19)	5.1% (16)	16.3% (51)	21.2% (66)	51.3% (160)
Do you think liquid medicine can be used regardless of the duration passed after opening it?	16.7% (52)	7.7% (24)	32% (100)	19.2% (60)	24.4% (76)
Do you think eye/nose/ear drops can be used regardless of the duration passed after opening it?	4.8% (15)	20.2% (63)	27.6% (86)	12.2% (38)	35.3% (110)



**Figure 1.** Distribution of the level of awareness about SM among participants

instructions before using SM. Regarding use of SM during pregnancy or lactation, 11% used SMs without a prescription, and 33% continued using SM and did not seek medical care even if their condition did not improve by using SM.

All risky practices were more prevalent among males than among females. Regarding the level of education, risky practices were more common among undergraduates in comparison to the faculty graduates and postgraduate students. Additionally, participants aged  $\geq 50$  years showed more prevalent risky practices (Table VI).

## Discussion

SM is the use of drugs to treat common health issues without a doctor's supervision. It involves using OTC drugs or prescription drugs available

to the patient for other health-related issues. Although most over-the-counter drugs are thought to be reasonably safe, some can have major negative effects [9]. Consumers frequently underestimate the hazards connected with OTC medications. Certain drugs, when used incorrectly, can cause serious harm to patients [10]. Clinical pharmacists play a crucial role in the prevention, early identification, and management of drug-related problems including OTC drugs and SMs using prescription-only drugs [11].

In the current study, it was found that 83% of participants were practicing SM. No significant difference was found between the prevalence of practicing SM between males and females. SM practice was more common among participants with a higher level of education and among the elderly population, of whom 100% practiced SM. Taking multivitamins was the most frequent form of SM (71.8%). The assessment of the overall awareness about SM among participants revealed that the total level of awareness was 71%, which is interpreted as a moderate level of awareness. Only 12% of participants reported great awareness of self-medication, 42% had poor awareness, and the remaining 46% had intermediate awareness.

Numerous studies have documented this practice among undergraduates, both in the medical and non-medical fields [12, 13] as well as among the general populace in other nations including Brazil [14], Peru [15], and KSA [1]. It was identified that health science students around the world are increasingly turning to self-medication [16, 17].

An earlier study conducted in India by Mathias *et al.* (2020) [18] studied the prevalence of SM among adolescents and showed less prevalence of SM (78.6%) in comparison to the current study (83%). The most used drug in Mathias' study were antipyretics (78.6%), followed by antitussives

**Table VI.** Crosstabulation and chi-square test of the prevalence of risky practices related to SMs and demographic data (\*statistically significant difference)

Variable	Crosstabulation and $\chi^2$ test											
	Gender					Age [years]					Level of education	
	Frequency (%)	Male	Female	P-value	18-< 30	30-< 50	≥ 50	P-value	Graduate	Undergraduate	Postgraduate studies	P-value
Prevalence of using SM after expiry dates:												
Yes	17 (5.4%)	12 (11.8%)	5 (2.4%)	< 0.05*	5 (2.3%)	5 (8.8%)	7 (17.1%)	< 0.05*	5 (3.9%)	7 (6%)	5 (7.6%)	< 0.05*
No	274 (87.8%)	76 (74.5%)	198 (94.3%)		203 (94.9%)	45 (78.9%)	26 (63.4%)		117 (90.7%)	101 (86.3%)	56 (84.8%)	
Sometimes	21 (6.7%)	14 (13.7%)	7 (3.3%)		6 (2.8%)	7 (12.3%)	8 (19.5%)		7 (5.4%)	9 (7.7%)	5 (7.8%)	
Total	312 (100%)	102 (100%)	210 (100%)		214 (100%)	57 (100%)	41 (100%)		129 (100%)	117 (100%)	66 (100%)	
Prevalence of using SM without checking expiry dates:												
Yes	38 (12.2%)	27 (26.5%)	11 (5.2%)	< 0.05*	17 (7.9%)	10 (17.5%)	11 (26.8%)	< 0.05*	8 (6.2%)	25 (21.4%)	5 (7.6%)	< 0.05*
No	190 (60.9%)	8 (7.8%)	182 (86.7%)		167 (78.1%)	13 (22.8%)	10 (24.4)		100 (77.5%)	41 (35%)	49 (74.2%)	
Sometimes	84 (26.9%)	67 (65.7%)	17 (8.1%)		30 (14%)	34 (59.6%)	20 (48.7%)		21 (16.3%)	51 (43.6%)	12 (18.2%)	
Total	312 (100%)	102 (100%)	210 (100%)		214 (100%)	57 (100%)	41 (100%)		129 (100%)	117 (100%)	66 (100%)	
Prevalence of using SM without reading the instructions:												
Yes	122 (39.1%)	83 (81.3%)	39 (18.6%)	< 0.05*	90 (42.1%)	13 (22.8%)	19 (46.3%)	< 0.05*	41 (31.8%)	76 (65%)	5 (7.6%)	< 0.05*
No	87 (27.9%)	6 (5.9%)	81 (38.6%)		70 (32.7%)	10 (17.5%)	7 (17.1%)		20 (15.5%)	17 (14.5%)	50 (75.8%)	
Sometimes	103 (33%)	13 (12.7%)	90 (42.9%)		54 (25.2%)	34 (59.6%)	15 (36.2%)		68 (52.7%)	24 (20.5%)	11 (16.7%)	
Total	312 (100%)	102 (100%)	210 (100%)		214 (100%)	57 (100%)	41 (100%)		129 (100%)	117 (100%)	66 (100%)	
Prevalence of using SM despite lack of improvement:												
Yes	103 (33%)	72 (70.6%)	31 (14.8%)	< 0.05*	29 (13.6%)	43 (75.4%)	31 (75.6%)	< 0.05*	23 (17.8%)	57 (48.7%)	23 (34.8%)	< 0.05*
No	209 (67%)	30 (29.4%)	179 (85.2%)		184 (86%)	14 (24.6%)	11 (24.4%)		106 (82.2%)	60 (51.2%)	43 (65.2%)	
Sometimes	0	0	0		0	0	0		0	0	0	
Total	312 (100%)	102 (100%)	210 (100%)		214 (100%)	57 (100%)	41 (100%)		129 (100%)	117 (100%)	66 (100%)	

(54.5%). However, in this study multivitamins were used more than other drugs. In Nepal, another study was conducted by Tesfamariam *et al.* (2019) [19], who concluded that analgesics (34.3%), antipyretics (15.7%), and cough and cold remedies (14.2%) were the preferred OTC medicine categories. Another study looked at the demographics of SM habits in Sub-Saharan Africa and discovered that OTC drug usage was more widespread among females, those with less than secondary education, and individuals over the age of 50 years [20].

The difference in the commonly used OTC drugs between the current study, in which multivitamins were used more than other drugs identified in earlier studies conducted outside and inside KSA, can be attributed to the higher quality of life and lower prevalence of infectious diseases for which antipyretics and cough suppressants are needed. The Kingdom of Saudi Arabia has proclaimed a new strategy for 2030, which includes a goal to increase the quality of healthcare in the Kingdom while preserving the effectiveness of spending [21].

The high prevalence of SM among the participants in this study was attributed to mild symptoms not necessitating visiting a physician or difficulty in scheduling a visit to a physician. However, 10% of participants mentioned that they were treating all their illnesses with SMs. Counselling regarding SM was received in most cases from pharmacists, but 38% of participants received inappropriate counselling either from earlier experience with a physician or from a friend, which can involve an error in problem identification or drug selection; additionally, 4% did not receive any counselling.

Authors (2020) [22] studied SM practices in different countries. It was concluded that multiple factors like age, gender, income, expense, self-care attitude, education level, medical knowledge, satisfaction, and disease perception all influence self-treatment patterns in different cultures.

Several previous studies assessed the awareness of different populations about SM and revealed inadequate levels in different communities. In Italy [23] it was found that the population was not aware of the concepts of contraindications, side effects, and dose identification. Participants with hypertension were using analgesics and decongestants without being aware that they could harm the control of their hypertension or the risk of abuse. Consumption of SMs without consultation or with advice from unqualified sources such as friends or relatives poses possible dangers such as wrong self-diagnosis, incorrect dosage, unsuitable therapy selection, masking of severe disease, and drug interactions. The danger of side effects is increased by a lack of awareness of warnings and precautions, storage conditions, the prescribed shelf-life, and unpleasant reactions [22].

To minimize the risk of adverse drug reactions that can occur because of the malpractice of SMs, community pharmacists are uniquely equipped to guide this practice, and, where necessary, to recommend medical guidance [24]. Pharmacists can help people make good lifestyle choices, recommend suitable OTC medications, as well as educate customers about when they should seek a higher level of medical care [25].

The most used SMs in the studied population were multivitamins. Similar results were recognized in a recent study conducted in the USA, where 84.6% of the studied sample were consuming multivitamins [26]. There is no evidence that taking vitamins without a medical prescription enhances the health of those who eat a diversified diet. Many people are tempted to use vitamin supplements by health claims, oblivious to the fact that proof of benefit is insufficient, let alone the risks of overdose [27]. Although they are considered relatively safe, numerous adverse effects have been reported by most vitamins. High dosages of pyridoxine (vitamin B<sub>6</sub>) can cause polyneuropathy, especially in motor neurons [28]. Vitamin E supplementation, although well known to be an effective molecule to reduce oxidative stress, cardiovascular diseases, and overall mortality, can lead to an increase in lung cancer risk especially in current smokers, with the use of doses higher than or equal to 400 mg/day and for a longer duration [29].

Hazardous effects can be induced by vitamin C supplements including prooxidant effects with subsequent cellular damage through enhancement of lipid peroxidation [30].

The risk of prostate cancer was found to be increased among those taking the folic acid supplement [31]. Vitamin A was proven to be associated with more risks, including increased incidence of lung cancer and greater mortality in cigarette smokers, including cardiovascular mortalities [32], teratogenic effects [33], and osteoporosis [34]. This shows that the high prevalence of the intake of multivitamins carries potential health-related risks, especially if taken without counselling. The prevalence of risky practices was assessed, and it was revealed that 7% of participants were using expired SMs, 12% did not check expiry dates, 39% did not read the instructions, 11% used SMs during pregnancy and lactation, and 33% of participants continued using SMs despite lack of improvement.

The expiration date is the last day on which the manufacturer guarantees a medication's complete efficacy and safety. Most pharmaceutical labels include drug expiration dates, including prescription, OTC, and dietary (herbal) supplements. The potency of medication steadily declines from the

time it is manufactured. Proper medicine storage may help to extend their potency. Because of heat and humidity, the bathroom and medicine cabinet are not suitable places to store pharmaceuticals. Medications should not be left in a hot automobile. Medications are most stable in dry, cool, light-free environments [35].

In Sweden, although most participants in the study conducted by Westerlund *et al.* (2017) [36] received their information regarding SMs from pharmacists, most of them were making mistakes like storing drugs in inappropriate circumstances [24].

A recent study conducted in Arar City, KSA by Elmahi *et al.* (2022) [37] found that 77% of participants practiced antibiotic self-medication. And 20.1% believed this is good practice [38]. This is considered risky behaviour not only on an individual level, but also on a community level because it is linked to increased pathogen resistance, a worldwide problem that may be caused by antibiotics given without a prescription, as well as a higher risk of serious health hazards such as prolonged suffering and adverse reactions.

In conclusion, SM, despite having multiple advantages, like reduction of the burden on health care facilities, relief of mild illnesses with time, and money saving, still carries the risk of adverse effects, and it can result in negative impact not only on the individual's health but also on the community. The current study concluded that SM is a common behaviour among adults in KSA to manage multiple illnesses, improving general health by taking multivitamins, managing dermatologic illnesses like acne and hair loss, and managing headaches, fever, gastrointestinal disturbances, and allergies. Assessment of awareness about appropriate SM practices showed that 12.4% of participants had excellent levels of awareness, 45.6% showed fair knowledge, and 42% showed poor knowledge. The prevalence of risky practices revealed that 7% of participants were using expired SMs, 12% did not check expiry dates, 39% did not read the instructions, 11% used SMs drugs during pregnancy and lactation without medical counselling, and 33% of participants continued using SMs even if their symptoms did not improve.

This highlights the importance of enhancing the level of awareness of the population about the benefits and hazards of SM, and how to minimize this risk, by appropriate identification of the ideal storage conditions of each drug, reading the instructions related to each drug, or asking for counselling from the pharmacist or any health care member. The role of pharmacists in the enhancement of awareness about SM should be emphasized, to reach the maximal safety and highest efficacy of different over-the-counter medications.

## Conflict of interest

The authors declare no conflict of interest.

## References

1. Al-Ghamdi S, Alfauri TM, Alharbi MA, et al. Current self-medication practices in the Kingdom of Saudi Arabia: an observational study. *Pan Afr Med J* 2020; 37: 51.
2. Siraj EA, Yayehrad AT, Kassaw AT, et al. Self-medication prevalence and factors associated with knowledge and attitude towards self-medication among undergraduate health science students at GAMBY Medical and Business College, Bahir Dar, Ethiopia. *Patient Prefer Adherence* 2022; 16: 3157-72.
3. Malik M, Tahir MJ, Jabbar R, et al. Self-medication during Covid-19 pandemic: challenges and opportunities. *Drugs Ther Perspect* 2020; 36: 565-7.
4. Alzoubi A, Nasor EM, Suliman EMO, et al. A comparative piloting of determinants of self-medication among University students in the MENA region; UAE and Jordan as an example. *Patient Prefer Adherence* 2023; 17: 699-709.
5. Quincho-Lopez A, Benites-Ibarra CA, Hilario-Gomez MM, et al. Self-medication practices to prevent or manage COVID-19: a systematic review. *PLoS One* 2021; 16: e0259317.
6. Wilbur K, Salam SE, Mohammadi E. Patient perceptions of pharmacist roles in guiding self-medication of over-the-counter therapy in Qatar. *Patient Prefer Adherence* 2010; 4: 87-93.
7. Farahani I, Farahani S, Deters MA, et al. Training pharmacy students in self-medication counseling using an objective structured clinical examination-based approach. *J Med Educ Curric Dev* 2021; 8: 23821205211016484.
8. Selvaraj K, Kumar SG, Ramalingam A. Prevalence of self-medication practices and its associated factors in Urban Puducherry, India. *Perspect Clin Res* 2014; 5: 32-6.
9. Saedder EA, Brock B, Nielsen LP, et al. Identifying high-risk medication: a systematic literature review. *Eur J Clin Pharmacol* 2014; 70: 637-45.
10. Yla-Rautio H, Siissalo S, Leikola S. Drug-related problems and pharmacy interventions in non-prescription medication, with a focus on high-risk over-the-counter medications. *Int J Clin Pharm* 2020; 42: 786-95.
11. Perrot S, Cittee 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: 1747-62.
12. Behzadifar M, Behzadifar M, Aryankhesal A, et al. Prevalence of self-medication in university students: systematic review and meta-analysis. *East Mediterr Health J* 2020; 26: 846-57.
13. Kanwal ZG, Fatima N, Azhar S, et al. Implications of self-medication among medical students-A dilemma. *J Pak Med Assoc* 2018; 68: 1363-7.
14. Arrais PS, Fernandes MER, da Silva Dal Pizzol T, et al. Prevalence of self-medication in Brazil and associated factors. *Rev Saude Publica* 2016; 50 (Suppl 2): 13s.
15. Barros-Sevillano JS, Sandoval CP, Alcarraz-Mundial LS, Barboza JJ. Self-medication in times of COVID-19. A perspective from Peru. *Gac Med Mex* 2021; 157: 116.
16. Ibrahim NK, Alamoudi BM, Baamer WO, Al-Raddadi RM. Self-medication with analgesics among medical students and interns in King Abdulaziz University, Jeddah, Saudi Arabia. *Pak J Med Sci* 2015; 31: 14-8.

17. Khan SD, Al-Garni M, Alalhareth FA, et al. Data on self-medication among healthcare students at Najran University, KSA. *Bioinformation* 2020; 17: 599-607.
18. Mathias EG, D'Souza A, Prabh S. Self-medication practices among the adolescent population of South Karnataka, India. *J Environ Public Health* 2020; 2020: 9021819.
19. Tesfamariam S, Anand IS, Kaleab G, et al. Self-medication with over-the-counter drugs, prevalence of risky practice and its associated factors in pharmacy outlets of Asmara, Eritrea. *BMC Public Health* 2019; 19: 159.
20. Kawuma R, Chimukuche RS, Francis AS, et al. Knowledge, use (misuse) and perceptions of over-the-counter analgesics in sub-Saharan Africa: a scoping review. *Glob Health Action* 2021; 14: 1955476.
21. Althumairy RI. Exploring the quality of life for Saudi patients utilizing dental healthcare services: a systematic review. *J Multidiscip Healthc* 2022; 15: 309-15.
22. Tagliaferri L, Vavassori A, Lancellotta V, et al. INTERACTS (INTERventional Radiotherapy ACTIVE Teaching School) consensus conference on sarcoma interventional radiotherapy (brachytherapy) endorsed by AIRO (Italian Association of Radiotherapy and Clinical Oncology). *J Contemp Brachytherapy* 2020; 12: 397-404.
23. Calamusa A, di Marzio a, Cristofani R, et al. Factors that influence Italian consumers' understanding of over-the-counter medicines and risk perception. *Patient Educ Couns* 2012; 87: 395-401.
24. Jairoun AA, Al-Hemyari SS, Shahwan M, et al. Assessing knowledge, attitude, and practice of community pharmacists on the pain management and implications in UAE children. *Pharm Pract (Granada)* 2022; 20: 2664.
25. Bell J, Dziekan G, pollack C, Mahachai V. Self-care in the twenty-first century: a vital role for the pharmacist. *Adv Ther* 2016; 33: 1691-703.
26. Tan ECK, Eshetie TC, Gray SL, Marcum ZA. Dietary supplement use in middle-aged and older adults. *J Nutr Health Aging* 2022; 26: 133-8.
27. Helwig A, Smulders Y. Toxicity of vitamin supplements. *Ned Tijdschr Geneesk* 2020; 164: D4762.
28. Bossard V, Bourmeyster N, Pasini S, et al. Problematic rise of vitamin B6 supplementation overuse and potential risk to bariatric surgery patients. *Nutrition* 2022; 102: 111738.
29. Slatore CG, Littman AJ, Au DH, et al. Long-term use of supplemental multivitamins, vitamin C, vitamin E, and folate does not reduce the risk of lung cancer. *Am J Respir Crit Care Med* 2008; 177: 524-30.
30. Hamishehkar H, Ranjdoost F, Asgharian P, et al. Vitamins, are they safe? *Adv Pharm Bull* 2016; 6: 467-77.
31. Figueiredo JC, Grau MV, Haile RW, et al. Folic acid and risk of prostate cancer: results from a randomized clinical trial. *J Natl Cancer Inst* 2009; 101: 432-5.
32. Omenn GS, Goodman GE, Thornquist MD, et al. Effects of a combination of beta carotene and vitamin A on lung cancer and cardiovascular disease. *N Engl J Med* 1996; 334: 1150-5.
33. Guillonneau M, Jacqz-Aigrain E. Teratogenic effects of vitamin A and its derivatives. *Arch Pediatr* 1997; 4: 867-74.
34. Jackson HA, Sheehan AH. Effect of vitamin A on fracture risk. *Ann Pharmacother* 2005; 39: 2086-90.
35. Gikonyo D, Gikonyo A, Luvayo D, Ponoth P. Drug expiry debate: the myth and the reality. *Afr Health Sci* 2019; 19: 2737-9.
36. Westerlund T, Barzi S, Bernstein C. Consumer views on safety of over-the-counter drugs, preferred retailers and information sources in Sweden: after re-regulation of the pharmacy market. *Pharm Pract (Granada)* 2017; 15: 894.
37. Elmahi OKO, Musa RAE, Shareef AAH, et al. Perception and practice of self-medication with antibiotics among medical students in Sudanese universities: a cross-sectional study. *PLoS One* 2022; 17: e0263067.
38. Eltom EH, Alanazi AL, Alenezi JF, et al. Self-medication with antibiotics and awareness of antibiotic resistance among the population in Arar city, Saudi Arabia. *J Infect Dev Ctries* 2022; 16: 1762-7.