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Prevalence and Patterns of Self-Medication Among Community Pharmacy Attendees in Sana'a City, Yemen

Duaa Mutahar^{1*}, Marwan Ahmed¹, Mohammed Dada¹, Naif Alhadery¹, Musab Al-Biehani¹, Ahmed S. Hudna²

¹Department of Community Medicine and Family Health, Faculty of Medicine and Health Sciences, University of Science and Technology (USTY), Sana'a, Yemen

²Department of Pediatrics, Faculty of Medicine and Health Sciences, University of Science and Technology (USTY), Aden, Yemen

* Corresponding author: Email: dr.duaamutahar@gmail.com

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ABSTRACT

Background: Self-medication, defined as taking medicines to treat self-reported symptoms or conditions without consulting a physician, is a major public health problem. Inappropriate self-medication can result in incorrect treatment, side effects, drug interactions, delayed diagnosis, and the emergence and spread of antimicrobial resistance (AMR). This study aimed to estimate the prevalence of self-medication and describe its patterns, reasons, medication classes, information sources, and associated sociodemographic characteristics among community pharmacy attendees in Sana'a City, Yemen.

Methods: A pharmacy-based cross-sectional study was conducted among 320 community pharmacy attendees in Sana'a City between December 2023 and January 2024. Ten pharmacies, one from each selected district, were included using a multistage sampling procedure, and eligible attendees were selected by systematic random sampling. Data were collected using a structured questionnaire administered by an interviewer. The Association between self-medication and participant characteristics was assessed using the chi-square or Fisher's exact test, as appropriate, with $P < 0.05$ considered statistically significant.

Results: Among the 320 participants, 306 reported engaging in self-medication, resulting in a prevalence rate of 95.6%. The most frequently reported symptoms or conditions included headache (79.7%), influenza-like symptoms, colds, or cough (65.4%), body pain (45.8%), fever (33.7%), gastrointestinal symptoms or heartburn (21.2%), sore throat (20.6%), diarrhea (18.0%), and allergic symptoms or rash (17.6%). The most commonly used medication classes were analgesics (83.7%), antipyretics (72.2%), antibiotics (59.5%), gastrointestinal medicines (33.3%), and decongestants (27.5%). Pharmacists were identified as the most frequent source of medication information (78.4%). Reasons for self-medication included the perception that the illness was minor (72.2%), saving time and money (29.4%), lack of trust in physicians (23.9%), previous experience with the medicine (20.3%), and perceived pharmacological knowledge (19.6%). No significant associations were found between self-medication and any assessed sociodemographic, health, or lifestyle characteristics.

Conclusion: Self-medication is common among community pharmacy attendees in Sana'a City, with analgesics, antipyretics, and antibiotics commonly used and pharmacists serving as the primary source of medication information. Strengthening professional pharmacy counseling, responsible medicine dispensing, and referral practices is essential to reduce inappropriate use, adverse outcomes, delayed diagnosis, and AMR.

Keywords: Self-medication ▪ Community pharmacy attendee ▪ Over-the-counter medications ▪ Yemen



1. Introduction

Self-medication refers to taking medicines without a prescription or professional consultation with a physician. It may involve self-diagnosis based on prior illness experiences, recommendations from relatives or friends with no formal medical training, or advice from other non-medical individuals.⁽¹⁾ The World Health Organization (WHO) defines self-medication as “the use of medicinal products to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a drug prescribed for recurrent or chronic illnesses or symptoms.”⁽²⁾ A prescription is required for most medications, except for over-the-counter (OTC) medicines, which may be purchased from pharmacies without a physician’s prescription. OTC medicines are authorized by the National Drug Regulatory Authority for use without direct medical supervision.⁽³⁾

Self-medication is a major public health problem, particularly among young people. Local evidence from Sana’a supports this concern, where among non-medical undergraduates with dysmenorrhea, 45.2% reported using self-administered medications, whereas only 8.4% sought medical consultation.⁽⁴⁾ In developing countries, inadequate healthcare services, and limited access to qualified healthcare professionals contribute to its high prevalence.⁽⁵⁾ This practice varies across cultures and is influenced by gender, age, income, educational attainment, and medical knowledge.⁽⁶⁾ Commonly self-medicated medications include antipyretics, analgesics, cold and cough remedies, dermatological products, nutritional supplements, and antibiotics.⁽⁷⁾

People obtain medication-related information from various sources, including the internet, books, advertisements, healthcare professionals such as pharmacists and nurses, friends and family members, personal experience, medical representatives, and educational or counseling pamphlets.⁽⁸⁾

Although self-medication is often practiced for minor health problems because of convenience, financial constraints, or limited access to healthcare, inappropriate self-medication can result in the progression or worsening of illness due to misdiagnosis; adverse drug reactions; dosing errors; drug interactions; dependence or abuse; antimicrobial resistance (AMR), particularly in countries where antibiotics are easily accessible; and harmful effects associated with expired or improperly stored medications.^(6,7,9)

According to WHO, community pharmacists are among the most accessible healthcare professionals to the public. They dispense prescription and OTC medications, provide health advice, and promote the safe and appropriate use of medicines, including responsible self-medication.⁽¹⁰⁾ In many countries, pharmacies function as important points of primary healthcare and provide essential medical guidance.⁽¹¹⁾ Pharmacists play a key role in educating patients on the proper use of medicines, identifying and resolving drug-related problems, and advising patients to consult physicians when necessary. They are integral members of the healthcare team and are amongst the most trustworthy and affordable healthcare professionals.^(12–14)

The International Pharmaceutical Federation emphasizes that pharmacists act as “gateways to care: helping people towards better health.” They support patients in making informed self-care decisions, particularly when selecting and using OTC or non-prescription medicines, thereby contributing to improved patient outcomes.⁽¹⁵⁾ Self-medication is a worldwide public health concern, particularly in developing countries.⁽¹⁶⁾ It is also widespread in economically disadvantaged regions, with Asia reportedly having the highest prevalence, at 71%.⁽¹⁷⁾ In Yemen, the ongoing conflict and deterioration of the healthcare system have compelled many people to rely on self-medication as a primary means of



managing their healthcare needs. In 2019, only 51% of the country's health facilities were reported to be fully functional.⁽¹⁸⁾ Additional concerns include pharmacies that dispense prescription-only medications without prescriptions, unqualified dispensers acting as informal healthcare providers, and the consequent risks of medication misuse, misdiagnosis, and inappropriate treatment.⁽¹⁾

Existing research on self-medication in Yemen is limited and has primarily focused on the general population.^(19,20) This study aimed to estimate the prevalence of self-medication and describe its patterns, reasons, medication classes, information sources, and associated factors among community pharmacy attendees in Sana'a City, Yemen.

2. Methods

2.1. Study design, population and setting

A pharmacy-based, cross-sectional study was conducted from December 2023 to January 2024 among community pharmacy attendees in Sana'a City. Participants were eligible if they were aged ≥ 16 years, regardless of gender. Individuals who declined to participate or requested medications with a prescription were not asked to complete the questionnaire.

2.2. Sample size and sampling method

A sample size of 316 community pharmacy attendees was calculated with Epi Info software, version 7.0 (CDC, Atlanta, GA, USA), based on the following criteria: an estimated population of 3,296,342 individuals aged ≥ 15 years,^(21,22) an expected self-medication prevalence of 71%,⁽¹⁶⁾ a 95% confidence level, a margin of error of 5%, and a design effect of 1.0 because negligible intracluster correlation was assumed, indicating that clustering by pharmacy was not expected to substantially increase the sampling variance. However, 320 participants were ultimately included in the study.

A multistage cluster sampling method was employed. In the first stage, ten pharmacies, one from each of the following ten districts in the city, were randomly selected from a list of 1,350 community pharmacies. In the second stage, the calculated sample size was proportionally allocated across the ten pharmacies. In the third stage, participants were selected using systematic random sampling. The procedure began by randomly selecting one of the first five eligible attendees, after which every fifth eligible attendee was enrolled until the required sample size was reached.

2.3. Data collection

A structured interviewer-administered questionnaire comprising two sections was used to collect data. The first section included information on participants' age, gender, marital status, education, employment, residence, chronic illness, health insurance, and lifestyle habits. The second section included questions about self-medication behaviors and was adapted from a similar study.⁽²³⁾ The questionnaire was reviewed by two experts specialized in community medicine to assess its content validity. The questionnaire was also pilot-tested among 20 community pharmacy attendees to assess its clarity and feasibility.

2.4. Data analysis

Data were analyzed using IBM SPSS Statistics, version 23.0 (IBM Corp., Armonk, NY, USA). Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as mean and standard deviation (SD). Associations between participants' self-medication status and their sociodemographic, health, and lifestyle characteristics were analyzed using the chi-square or Fisher's exact test, as appropriate. A P value < 0.05 was considered statistically significant.



3. Results

3.1. Participant characteristics

Table 1 shows that the mean age of participants was 31.4 ± 10.8 years (range: 16–72). Of the 320 participants, 90.3% of participants were aged ≤ 45 years. Low educational attainment, defined as being illiterate, being able to read and write without completing formal schooling, or having primary education, was reported by 38.4% of participants. Secondary education was reported by 34.1%, while 27.5% had university-level education or higher. Most participants were male (86.6%), married (58.4%), not employed (70.9%), and residents of urban areas (94.1%). Of participants, 15% reported at least one chronic illness. Diabetes was reported by 4.4% of participants, hypertension by 3.4%, asthma by 2.5%, heart disease by 1.9%, neurological disorders by 1.6%, and musculoskeletal disorders by 1.3%. Only 13.8% of participants had health insurance. Khat chewing and smoking were reported by 71.9% and 30.6% of participants, respectively.

3.2. Patterns and reasons for self-medication

Table 2 shows that of the 320 participants, 95.6% reported obtaining or using medicines without a physician's prescription and were classified as practicing self-medication. Among these participants, 90.8% reported obtaining medicines for themselves, 44.8% for relatives, and 39.9% for their children. Participants could select more than one intended recipient. The most frequently reported reason for self-medication was perceiving the condition as a minor illness (72.2%). Other reasons were saving time and money (29.4%), lack of trust in physicians (23.9%), previous experience with a particular medicine (20.3%), perceived sufficient pharmacological knowledge (19.6%), avoiding crowding at primary healthcare centers (14.1%), high consultation costs (12.4%), privacy concerns (8.2%), distance from

primary healthcare centers (5.9%), and emergency circumstances (4.6%).

Table 1: Characteristics of participating community pharmacy attendees included in the study*

Characteristic	n (%)
Age (years)	
Mean $\pm$ SD: 31.4 ± 10.8	
16–25	123 (38.4)
26–35	110 (34.4)
36–45	56 (17.5)
46–55	19 (5.9)
>55	12 (3.8)
Gender	
Male	277 (86.6)
Female	43 (13.4)
Marital status	
Single	133 (41.6)
Married	187 (58.4)
Educational status	
Illiterate	25 (7.8)
Able to read and write	30 (9.4)
Primary education	68 (21.3)
Secondary education	109 (34.1)
University education or higher	88 (27.5)
Employment status	
Employed	93 (29.1)
Not employed	227 (70.9)
Place of residence	
Urban	301 (94.1)
Rural	19 (5.9)
Chronic illness	
Yes	48 (15.0)
No	272 (85.0)
Reported chronic illness	
Diabetes	14 (4.4)
Hypertension	11 (3.4)
Asthma	8 (2.5)
Heart disease	6 (1.9)
Neurological disorder	5 (1.6)
Musculoskeletal disorder	4 (1.3)
Health insurance	
Yes	44 (13.8)
No	276 (86.3)
Khat chewing	
Yes	230 (71.9)
No	90 (28.1)
Smoking	
Yes	98 (30.6)
No	222 (69.4)

* The total number of participants was 320. SD, standard deviation.



Table 2: Patterns and reasons for self-medication among community pharmacy attendees in Sana'a City, Yemen, 2024

Variable	n (%)
Buying medicines without a prescription (N = 320)	
Yes	306 (95.6)
No	14 (4.4)
Intended recipient of self-medication (N = 306)	
Participant	278 (90.8)
Relative	137 (44.8)
Child or children	122 (39.9)
Symptoms or conditions treated (N = 306)	
Headache	244 (79.7)
Flu-like symptoms, cold, or cough	200 (65.4)
Body pain or aches	140 (45.8)
Fever	103 (33.7)
Heartburn or gastrointestinal symptoms	65 (21.2)
Sore throat	63 (20.6)
Diarrhea	55 (18.0)
Allergies or rash	54 (17.6)
Urinary symptoms	31 (10.1)
Dental problems	21 (6.9)
Gynecological problems	20 (6.5)
Insomnia	19 (6.2)
Medication classes used (N = 306)	
Analgesics	256 (83.7)
Antipyretics	221 (72.2)
Antibiotics	182 (59.5)
Gastrointestinal medicines	102 (33.3)
Decongestants	84 (27.5)
Vitamins	57 (18.6)
Dermatological preparations	51 (16.7)
Other medicines	12 (3.9)
Reasons for self-medication (N = 306)^a	
Perceived minor illness	221 (72.2)
Saving time and money	90 (29.4)
Lack of trust in physicians	73 (23.9)
Previous experience with a particular medicine	62 (20.3)
Perceived sufficient pharmacological knowledge	60 (19.6)
Avoiding crowding at primary healthcare centers	43 (14.1)
High consultation costs	38 (12.4)
Privacy concerns	25 (8.2)
Distance from a primary healthcare center	18 (5.9)
Emergency circumstances	14 (4.6)

3.3. Sources of information regarding self-medication

The most common source of information about self-medication was pharmacists, reported by 78.4% of participants, followed by previous prescriptions (30.7%) and seeking advice from friends or relatives (21.9%). Nurses were consulted by 17.3% of participants, whereas 14.1% relied on their own academic

knowledge. The internet served as a source of information for 7.2% of participants, and only 3.3% relied on drug advertisements (Figure 1).

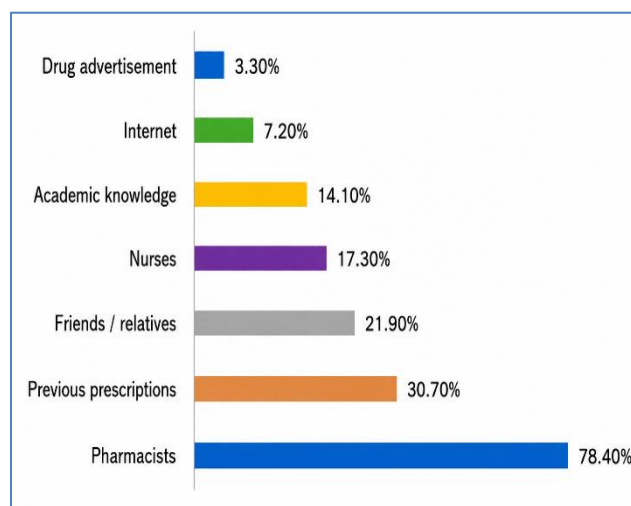


Figure 1: Reported sources of information about self-medication among community pharmacy attendees in Sana'a City, Yemen 2024

3.4. Association of demographic, health-related, and lifestyle characteristics with self-medication

Table 3 shows that none of the demographic variables was significantly associated with self-medication, including gender ($P = 0.924$), age ($P = 0.728$), marital status ($P = 0.226$), educational status ($P = 0.728$), employment status ($P = 0.520$), and place of residence ($P = 0.845$). Similarly, no significant associations were observed between self-medication and the health-related variables, including the presence of a chronic illness ($P = 0.146$) and health insurance coverage ($P = 0.100$). Regarding lifestyle factors, neither khat chewing ($P = 0.970$) nor smoking status ($P = 0.108$) was significantly associated with self-medication.



Table 3: Association of demographic, health-related, and life-style characteristics with self-medication among community pharmacy attendees in Sana'a City, Yemen, 2024

Factors	N	n (%)	P value
Gender			
Male	277	265 (95.7)	0.924
Female	43	41 (95.3)	
Age (years)			
16–25	123	117 (95.1)	0.728
>25	197	189 (95.9)	
Marital status			
Single	133	125 (94.0)	0.226
Married	187	181 (96.8)	
Educational level ^a			
Low	123	117 (95.1)	0.728
High	197	189 (95.9)	
Employment status			
Employed	93	90 (96.8)	0.520
Unemployed	227	216 (95.2)	
Place of residence			
Urban	301	288 (95.7)	0.845
Rural	19	18 (94.7)	
Presence of chronic illness			
Yes	48	44 (91.7)	0.146
No	272	262 (96.3)	
Health insurance coverage			
Yes	44	40 (90.9)	0.100
No	276	266 (96.4)	
Khat chewing			
Yes	230	220 (95.7)	0.970
No	90	86 (95.6)	
Smoking			
Yes	98	91 (92.9)	0.108
No	222	215 (96.8)	

N, number of respondents; n, number of respondents reporting self-medication. ^a Low level included illiterate, able to read and write, or primary education, while high level included secondary education or above.

4. Discussion

Self-medication is a widespread practice globally, and the use of pharmaceuticals without professional supervision represents a substantial public health concern. The present study revealed an exceptionally high prevalence of self-medication (95.6%) among community pharmacy attendees, exceeding the rates reported from Sana'a (87.1%) and Ibb (85.0%) governorate.^(19,20) This estimate is also higher than those reported in studies conducted Al-Madinah Al-Munawwarah, Saudi Arabia (74.7%),⁽²⁴⁾ Malaysia (62.7%),⁽²⁵⁾ Asmara, Eritrea (45.1%),⁽²⁶⁾ India (35%),⁽²⁷⁾

and Kuwait (27.5%).⁽²⁸⁾ The high prevalence observed in the current study may reflect several factors, including limited access to healthcare, high treatment costs, cultural acceptance of self-treatment, and weak enforcement of prescription-only medicine regulations amid Yemen's ongoing conflict. The predominance of younger and unemployed participants may also have contributed. However, comparisons with other studies should be interpreted cautiously because of differences in study populations, sampling methods, self-medication definition, and healthcare contexts. Moreover, because the study recruited community pharmacy attendees, the sampling setting may have resulted in a higher prevalence than would be expected in the general population.

Analgesics were the most frequently self-medicated medicines, requested by 83.7% of participants. This proportion is almost consistent with that (90.1%) reported among consumers in Sana'a City.⁽¹⁹⁾ It also aligns with findings reported from Nigeria (95.2%),⁽²⁹⁾ Jazan, Saudi Arabia (87%),⁽³⁰⁾ and India (77.6%).⁽²⁷⁾ However, it is higher than those reported in Syria (55.7%) and Al-Madinah Al-Munawwarah, Saudi Arabia (51.2%).^(24,31) The frequent use of analgesics may be attributed to their widespread availability without prescription and the high occurrence of symptoms such as headache and musculoskeletal pain. Differences between countries may reflect variations in medicine availability, regulatory enforcement, healthcare accessibility, local patterns of illness, and public knowledge regarding the risks associated with analgesic use.

Antipyretics were the second most frequently bought medications, requested by 72.2% of participants in the present study, which is higher than that (55%) reported in Saudi Arabia.⁽²⁴⁾ Their frequent use may reflect the common occurrence of febrile illnesses, limited access to healthcare services, and



the availability of these medicines from community pharmacies. Nevertheless, this difference should not be attributed solely to conflict, poverty, or regulatory weaknesses because differences in study design, population characteristics, and patterns of infectious disease may also have contributed.

In the present study, antibiotic self-medication was observed among 59.5% of participants, a proportion comparable to that reported in Sudan (60.8%),⁽³²⁾ but higher than those documented in Eritrea (45.1%),⁽²⁶⁾ the United Arab Emirates (32%),⁽³³⁾ and India (32.9%).⁽²⁷⁾ The similarity between the findings from Yemen and Sudan may partly reflect comparable barriers to healthcare access and weak enforcement of regulations governing antibiotic sales. The high level of antibiotic use without appropriate medical supervision is a major public health concern because unnecessary or inappropriate antibiotic use can contribute to adverse drug reactions, treatment failure, and the emergence and spread of AMR.⁽³⁴⁾

Among the reported indications for self-medication in the present study, headache was the most common, reported by 79.7% of participants. This proportion was higher than those reported from Egypt (58.9%) and Saudi Arabia (39%).^(30,35) Cold, flu-like, and cough symptoms were reported by 65.4% of participants, compared with 49.3% in Egypt and 12.9% in Sudan.^(35,36) This finding is particularly relevant in the local context, as a study conducted in pediatric and ear, nose and throat clinics in Sana'a found that 94.7% of outpatients with upper respiratory tract infections received antibiotics, including a high proportion of prescriptions for infections unlikely to be bacterial.⁽³⁷⁾ The high frequency of self-medication for respiratory symptoms may be related to environmental and living conditions, including exposure to dust, overcrowding, poor housing, malnutrition, and increased transmission of respiratory infections. However, these explanations were

not directly assessed in the present study and should therefore be regarded as possible interpretations rather than established causal factors.

Perceiving the illness as minor was the most frequently reported reason for self-medication, cited by 72.2% of participants in the present study. This proportion was comparable to that reported in Egypt (73.9%),⁽³⁵⁾ but higher than those reported in Jordan (46.4%),⁽³⁸⁾ the United Arab Emirates (52%),⁽³³⁾ and India (37.7%).⁽²⁷⁾ Saving time and money was reported by 29.4% of participants, which is lower than those observed in Saudi Arabia (59%) and Jordan (34.6%),^(30,38) but higher than that reported in Egypt (23.7%).⁽³⁵⁾ These findings suggest that self-medication is driven by a combination of perceived symptom severity, convenience, financial considerations, previous experience, and barriers to accessing formal healthcare.

Pharmacists were the most frequently reported source of information about self-medication, cited by 78.4% of participants in the present study. This finding is consistent with those reported in Saudi Arabia (78%) and the United Arab Emirates (76.0%),^(30,33) but higher than those reported in Egypt (69.9%),⁽³⁵⁾ India (28%),⁽²⁷⁾ Sana'a, Yemen (26%),⁽³⁹⁾ and Jordan (14%).⁽³⁸⁾ The prominent role of pharmacists may be explained by their accessibility, the public's confidence in pharmacies as first points of care, the cost and inconvenience of medical consultations, and the limited availability of other healthcare services. Although pharmacists can support responsible self-care, dispensing prescription-only medicines without appropriate clinical assessment may increase the risks of misdiagnosis, inappropriate treatment, adverse drug reactions, and delayed referral for serious conditions. The importance of this finding is reinforced by a recent study among retail pharmacists in Sana'a, which found that 86.0% demonstrated poor antibiotic-dispensing practices



and 35.7% reported dispensing antibiotics without a prescription.⁽⁴⁰⁾

Self-medication may be particularly concerning among individuals with chronic diseases. In the present study, only 15% of participants reported chronic illnesses, including diabetes mellitus, hypertension, asthma, and cardiovascular diseases. Although self-medication is often associated with acute or minor conditions, individuals with chronic illnesses may also use medicines intermittently or continuously to manage recurrent symptoms or episodes of disease worsening, particularly when access to professional healthcare is limited.⁽⁴¹⁾ This group may be at greater risk because unsupervised use of OTC medicines, including analgesics and combination cold and influenza preparations, may be inappropriate for people with hypertension, diabetes, kidney disease, liver disease, or cardiovascular conditions. Such use may result in drug-disease or drug-drug interactions, adverse effects, poor control of chronic illness, and delays in seeking appropriate medical care.⁽⁴¹⁾

This study found no significant association with the studied demographic, health-related, or lifestyle characteristics. This finding should not be interpreted as evidence that these factors have no influence on self-medication. Rather, the extremely high prevalence of self-medication in the study population may have produced a ceiling effect, leaving little variation between participants and reducing the ability of statistical analyses to detect meaningful differences across subgroups. The pharmacy-based sampling approach may also have yielded a relatively homogeneous group with similar patterns of medicine-seeking behavior. In addition, limited subgroup sizes, broad categorization of some variables, and unmeasured factors, such as household income, distance to healthcare facilities, perceived illness severity, previous treatment experience, and

knowledge of medication risks, may have reduced the statistical power to identify associations or resulted in residual confounding. These findings suggest that self-medication may be widespread across sociodemographic groups in this setting; however, larger population-based studies using more detailed measures are needed to clarify its determinants. Although khat chewers may use medications, particularly analgesics, during or after chewing sessions to relieve associated symptoms or discomfort, the present study found no statistically significant association between khat chewing and self-medication. Therefore, khat chewing does not appear to influence self-medication in this population. Therefore, using medicine-specific information and detailed assessments of participants' motives for medication use should be investigated.

This study provides valuable information about self-medication among community pharmacy attendees in Sana'a. Nevertheless, it has several limitations. First, its cross-sectional design precludes causal inference, while recruitment from urban community pharmacies in a single city may have introduced selection bias and limits generalizability, particularly to rural populations. Second, self-reported data are subject to recall and social desirability biases, and medication use could not be independently verified. Third, the marked imbalance between participants who purchased medicines without a prescription and those who purchased medicines with a prescription may have reduced statistical power and prevented valid multivariable logistic regression, possibly explaining the absence of significant associations. The predominance of male participants may also have underrepresented women's self-medication practices. In addition, the study did not fully assess the appropriateness, dosage, duration, indications, or clinical consequences of the medicines purchased.



5. Conclusion

Self-medication is common among community pharmacy attendees in Sana'a City, and may be practiced by more than nine in ten participants. Analgesics, antipyretics, and antibiotics are among the most frequently used medicines, while pharmacists represent the leading source of medication-related information. The frequent unsupervised use of antibiotics and other potentially high-risk medicines raises substantial concerns regarding adverse drug reactions, inappropriate treatment, delayed diagnosis, and AMR. The prominent role of community pharmacies as sources of medicines and health information highlights the importance of strengthening pharmacy practice, professional counseling, and appropriate referral. Future multicenter and longitudinal studies are needed in Sana'a and other governorates of Yemen to assess changes over time, identify determinants of inappropriate self-medication, examine medicine-specific practices, and evaluate associated clinical and public health outcomes.

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Ethical approval

The Research Ethics Committee of the University of Science and Technology, Sana'a, Yemen, approved the study (ethical clearance no. 1447/0097/UREC/UST). Permission was also obtained from the relevant health offices and the owners of the selected pharmacies. The committee waived the requirement for written informed consent because the study involved minimal risk and used an anonymous questionnaire. Before the questionnaire was administered, participants were informed about the purpose of the study, and verbal informed consent was obtained from each participant. They were informed that participation was voluntary and that they could decline to participate, withdraw from the study, or

skip any question without consequences. All data were kept confidential and used solely for research purposes

Conflict of interest

The authors declare no conflict of interest.

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References

1. Al-Worafi YM, editor. Drug safety in developing countries: achievements and challenges. London: Academic Press; 2020. p. 3–5. [DOI](#) • [Google Scholar](#)
2. Yakubu R, Isa AM, Abubakar IJ, Oreagba I, Awaisu A. Drug safety in Nigeria. In: Al-Worafi YM, editor. Drug safety in developing countries: achievements and challenges. London: Academic Press; 2020. p. 525–56. [DOI](#) • [Google Scholar](#)
3. Gutema GB, Gadisa DA, Kidanemariam ZA, Berhe DF, Berhe AH, Hadera MG, et al. Self-medication practices among health sciences students: the case of Mekelle University. J Appl Pharm Sci. 2011;1(10):183–9. [Google Scholar](#)
4. Abdulaziz M, Almikhlafe A, Alkasmy WA, Al-Hammadi LN, Aqlan MN, Shukri NA, et al. Prevalence, severity and quality-of-life impact of dysmenorrhea among non-medical undergraduates in Sana'a City, Yemen. UST J Med Sci. 2026;4:7. [DOI](#) • [Google Scholar](#)
5. Shankar PR, Partha P, Shenoy N. Self-medication and non-doctor prescription practices in Pokhara Valley, Western Nepal: a questionnaire-based study. BMC Fam Pract. 2002;3:17. [DOI](#) • [PubMed](#) • [Google Scholar](#)
6. De Sanctis V, Soliman AT, Daar S, Di Maio S, Elalaily R, Fiscina B, et al. Prevalence, attitude, and practice of self-medication among adolescents and the paradigm of dysmenorrhea self-care management in different countries. Acta Biomed. 2020;91(1):182–92. [DOI](#) • [PubMed](#) • [Google Scholar](#)
7. Shafie M, Eyasu M, Muzeyin K, Worku Y, Martin-Aragón S. Prevalence and determinants of self-medication practice among selected households in Addis Ababa community. PLoS One 2018;13(3):e0194122. [DOI](#) • [PubMed](#) • [Google Scholar](#)
8. Bennadi D. Self-medication: a current challenge. J Basic Clin Pharm. 2013;5(1):19–23. [DOI](#) • [PubMed](#) • [Google Scholar](#)
9. Phalke VD, Phalke DB, Durgawale PM. Self-medication practices in rural Maharashtra. Indian J Community Med. 2006;31(1):34–5. [DOI](#) • [Google Scholar](#)
10. World Health Organization. The role of the pharmacist in the health care system: report of a WHO Consultative Group, New Delhi, India, 13–16 December 1988; report of a WHO meeting, Tokyo, Japan, 31 August – 3 September 1993. Geneva: WHO; 1994. [Google Scholar](#)
11. Laliberté MC, Perreault S, Damestoy N, Lalonde L. Ideal and actual involvement of community pharmacists in health promotion and prevention: a cross-sectional study in Quebec, Canada. BMC Public Health 2012;12:192. [DOI](#) • [PubMed](#) • [Google Scholar](#)



12. 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. [DOI](#) • [PubMed](#) • [Google Scholar](#)
13. Agency for Healthcare Research and Quality, Patient Safety Network. The pharmacist's role in medication safety. Rockville: Agency for Healthcare Research and Quality; 2019 [cited 2026 Jul 23]. Available from: <https://psnet.ahrq.gov/primer/pharmacists-role-medication-safety>
14. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm*. 1990;47(3):533–43. [PubMed](#) • [Google Scholar](#)
15. International Pharmaceutical Federation. Pharmacy: gateway to care. The Hague: International Pharmaceutical Federation; 2017 [cited 2026 Jul 23]. Available from: <https://www.fip.org/file/1590>
16. Abdelwahed AE, Abd-Elkader MM, Mahfouz A, Abdelmawla MO, Kabeel M, Elkot AG, et al. Prevalence and influencing factors of self-medication during the COVID-19 pandemic in the Arab region: a multinational cross-sectional study. *BMC Public Health* 2023;23:180. [DOI](#) • [PubMed](#) • [Google Scholar](#)
17. Ghasemyani S, Roohravan Benis M, Hosseini-fard H, Jahangiri R, Aryankhesal A, Shabaninejad H, et al. Global, WHO regional, and continental prevalence of self-medication from 2000 to 2018: a systematic review and meta-analysis. *Ann Public Health*. 2022;1:585–600. [DOI](#) • [Google Scholar](#)
18. United Nations Office for the Coordination of Humanitarian Affairs (OCHA). *Yemen Humanitarian Needs Overview 2019*. New York: OCHA; 2018 [cited 2026 Jul 23]. Available from: https://yemen.un.org/sites/default/files/201908/2019_Yemen_HNO_FINAL.pdf
19. Albawani SM, Hassan YB, Abd-Aziz N, Gnanasan S. Self-medication practice among consumers in Sana'a City. *Int J Pharm Pharm Sci*. 2016;8(1):119–24. [DOI](#) • [Google Scholar](#)
20. Mojali S, Al-Ghanim S, Alduais AM, Al-Shabrani BF. Self-medication practice among Yemeni patients in Ibb City: a survey study exploring patients' perceptive. *J Hosp Adm*. 2015;4(4):32–40. [DOI](#) • [Google Scholar](#)
21. Political Development Forum Yemen. Political Development Forum Yemen (PDF-Yemen). Sana'a: PDF-Yemen; 2021 [cited 2026 Jul 23]. Available from: <http://www.pdfyemen.com>
22. Ministry of Public Health and Population, Central Statistical Organization, The Pan Arab Program for Family Health, ICF International. National health and demographic survey 2013. Rockville (MD): ICF International; 2015.
23. Limaye D, Limaye V, Krause G, Fortwengel G. A systematic review of the literature on survey questionnaires to assess self-medication practices. *Int J Community Med Public Health*. 2017;4(8):2623–8. [DOI](#) • [Google Scholar](#)
24. Allam AT, Amer SM. Prevalence and factors influencing self-medication in Medina Al-Munawara, Saudi Arabia. *Arch Pharm Pract*. 2020;11(4):85–92. [Google Scholar](#)
25. Hassali MA, Shafie AA, Al-Qazaz H, Tambyappa J, Palaian S, Hariraj V. Self-medication practices among adult population attending community pharmacies in Malaysia: an exploratory study. *Int J Clin Pharm*. 2011;33(5):794–9. [DOI](#) • [PubMed](#) • [Google Scholar](#)
26. Ateshim Y, Bereket B, Major F, Emun Y, Woldai B, Pasha I, et al. Prevalence of self-medication with antibiotics and associated factors in the community of Asmara, Eritrea: a descriptive cross-sectional survey. *BMC Public Health* 2019;19:726. [DOI](#) • [PubMed](#) • [Google Scholar](#)
27. Sridevi K, Subbaiah MV, Surekha M, Harini J, Sujana D, Sankar AR. Assessment of self-medication practices among community people. *IOSR J Dent Med Sci*. 2017;16(5):75–82. [DOI](#) • [Google Scholar](#)
28. Negarandeh R, Jahan Shayan S, Nazari R, Kiwanuka F, Akhavan Rad S. Self-medication with antibiotics in the WHO Eastern Mediterranean Region: a systematic review and meta-analysis. *Research Square* [Preprint]. 2020. [DOI](#) • [Google Scholar](#)
29. Oyediran OO, Ayandiran EO, Olatubi MI, Olabode O. Awareness of risks associated with self-medication among patients attending the general outpatient department of a tertiary hospital in southwestern Nigeria. *Int J Afr Nurs Sci*. 2019;10:110–5. [DOI](#) • [Google Scholar](#)
30. Faqih AHMA, Sayed SF. Self-medication practice with analgesics (NSAIDs and acetaminophen), and antibiotics among nursing undergraduates in University College Farasan Campus, Jazan University, KSA. *Ann Pharm Fr*. 2021;79(3):275–85. [DOI](#) • [PubMed](#) • [Google Scholar](#)
31. Abdelwahed RNK, Jassem M, Alyousbashi A. Self-medication practices, prevalence, and associated factors among Syrian adult patients: a cross-sectional study. *J Environ Public Health*. 2022;2022:9274610. [DOI](#) • [PubMed](#) • [Google Scholar](#)
32. Elmahi OKO, Musa RAE, Shareef AAH, Omer MEA, Elmahi MAM, Altamih RAA, et al. Perception and practice of self-medication with antibiotics among medical students in Sudanese universities: a cross-sectional study. *PLoS One* 2022;17(1):e0263067. [DOI](#) • [PubMed](#) • [Google Scholar](#)
33. Sharif SI. Evaluation of self-medication among pharmacy students. *Am J Pharmacol Toxicol*. 2012;7(3):135–40. [DOI](#) • [Google Scholar](#)
34. Helal RM, Abou-ElWafa HS. Self-medication in university students from the city of Mansoura, Egypt. *J Environ Public Health* 2017;2017:9145193. [DOI](#) • [PubMed](#) • [Google Scholar](#)
35. Abdul-Ghani R. A national antimicrobial resistance surveillance network in Yemen: an urgent call for action. *UST J Med Sci*. 2025;3:1. [DOI](#) • [Google Scholar](#)
36. Awad A, Eltayeb I, Matowe L, Thalib L. Self-medication with antibiotics and antimalarials in the community of Khartoum State, Sudan. *J Pharm Pharm Sci*. 2005;8(2):326–31. [PubMed](#) • [Google Scholar](#)
37. Al-Khazzan AY, Ibrahim DA, Halboup AM, Harun SN, Al-Dhubai S, Hayal N, et al. Determinants of antibiotic prescribing for upper respiratory tract infections in Sana'a City, Yemen. *UST J Med Sci*. 2024;2:6. [DOI](#) • [Google Scholar](#)
38. Yousef AM, Al-Bakri AG, Bustanji Y, Wazaify M. Self-medication patterns in Amman, Jordan. *Pharm World Sci*. 2008;30(1):24–30. [DOI](#) • [PubMed](#) • [Google Scholar](#)
39. Mohanna M. Self-medication with antibiotics in children in Sana'a City, Yemen. *Oman Med J*. 2010;25(1):41–3. [DOI](#) • [PubMed](#) • [Google Scholar](#)



40. Al-Subol IH, Al-Moliky AH, Nassar MT, Al-Bakali AA, Al-Mashreqi FA, Alwajeh RJ, et al. Discrepancy between knowledge and practice regarding antimicrobial resistance among retail pharmacists in Sana'a City, Yemen. UST J Med Sci. 2026;4:4. [DOI](#) • [Google Scholar](#)
41. World Health Organization. Guidelines for the regulatory assessment of medicinal products for use in self-medication. Geneva: WHO; 2000.



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