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Prevalence of self-medication among students of Umm Al-Qura and Al-Baha Universities in Saudi Arabia

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ABSTRACT

Background: Self-medication is defined as the self-administration of medication based on self-diagnosis without visiting a physician or having a prescription and is a public health concern with potentially harmful consequences. Our study aimed to explore patterns of self-medication among medical and non-medical students at Umm Al-Qura and Al-Baha Universities in southwestern Saudi Arabia. *Materials and Methods:* An online, self-administered, questionnaire-based, cross-sectional survey was conducted via Google Forms for 3 weeks among students at Umm Al-Qura and Al-Baha Universities. *Results:* Out of the 418 students who responded to the questionnaire, 74.2% were practicing self-medication. The use of painkillers was significantly different among both the medical (40.4%) and non-medical students (61.5%). As for reasons to practice self-medication, time savings (40.3%) mild symptoms (20.0%), previous experience (14.8%), and financial reasons (14.5%) were the most common, with the flu symptoms (23.9%) and headache (23.5%) being the most reported symptoms treated by self-medication. *Conclusions:* Self-medication is a widespread practice among medical and non-medical students at Umm Al-Qura and Al-Baha Universities which needs to be mitigated by health education and effective preventive and interventional policies.

Keywords: Self-medication, Antibiotics, Painkillers, Medical students, Non-medical students, Saudi Arabia

1. INTRODUCTION

A global phenomenon, self-medication refers to the self-administration of medication based on self-diagnosis without having a prescription or even visiting a physician (WHO, 2000; Sunny et al., 2019; Maqbul et al., 2022). Self-medication practice can lead to various medical complications, including misdiagnosis and/or delayed diagnosis, insomnia, kidney and liver

dysfunction, immune system weakness, and antibiotic resistance (Khan, 2018; Rather et al., 2017), and is therefore considered to be a public health burden.

Patients shift to self-medication instead of visiting a hospital or medical center for a variety of reasons. For example, a study conducted in Saudi Arabia showed that 46.1% of patients who practiced self-medication found it to be difficult to reach the hospital, while 45.2% said that the health centers were inadequate in the first place. Other reasons included the lack of medical insurance and only mild symptoms that did not seem to require visiting a hospital (Al-Ghamdi et al., 2020). Globally, the phenomenon of self-medication affects developed and developing countries alike despite differences in their cultures and health care systems. For instance, a questionnaire-based study conducted in Sweden revealed that only three of every 1,000 participants used antibiotics with a prescription, while the rest self-medicated with antibiotics without a prescription (Svensson et al., 2004). Meanwhile, a study conducted in 2015 in Jordan revealed a high prevalence of self-medication, especially among students of medicine and pharmacy (Alkhatatbeh et al., 2016).

The phenomenon is also predominant in Saudi Arabia, where several studies on the topic of self-medication have been conducted. One such study involving medical interns at King Abdulaziz University in Jeddah, Saudi Arabia, revealed that 75.2% of them practiced self-medication (Ibrahim et al., 2014). Similarly high rates of self-medication were found among male university students in Qassim province (Al-Worafi et al., 2014). In Riyadh, a cross-sectional questionnaire-based study was conducted in randomly selected community pharmacies, where self-administered questionnaires were distributed randomly to consumers purchasing medication. The findings showed that 285 medications were purchased without a prescription and that approximately half (49%) required a prescription but the other half (51%) did not, because they were over-the-counter medications (Aljadhey et al., 2015).

Among researches on the topic addressing university students, a study conducted at King Khalid University in Abha, Saudi Arabia, revealed a high prevalence of self-medication using painkillers among medical students (91.6%) and self-medication with antibiotics without a prescription among non-medical students (35.4%) (Alshahrani et al., 2019). Given the significance of self-medication and its implications for public health, in this study we aimed to investigate the prevalence of knowledge about, attitude toward, and practice of self-medication among medical and non-medical students at two universities, Umm Al-Qura and Al-Baha Universities, in southwestern Saudi Arabia.

2 MATERIALS AND METHODS

Our cross-sectional, self-administered, questionnaire-based study was conducted from March 15 to April 6, 2022. The target population for participants was all medical and non-medical university students attending Umm Al-Qura University in Makkah province or Al-Baha University in Al-Baha province, both in southwestern Saudi Arabia.

The calculation of the sample size was according to the rates of prevalence of self-medication among university students as determined in previous studies conducted at various universities in Saudi Arabia. Given the total number of students at both Umm Al-Qura University and Al-Baha University with an α level set at 5% and the confidence interval set at 95% with 5% precision, a sample of 338 participants was required. To overcome potential bias due to using online methods of data collection that depend primarily on snowball sampling, we added 20% of the required sample to reach a total of 418 participants.

Data collection

We developed and revised the questionnaire for the survey with reference to the literature, after which three assistant professors in the medical and health sciences field evaluated the data collection instrument. The questionnaire addressed the students' sociodemographic background; their knowledge about, attitude toward, and practice of self-medication; the signs or symptoms and more general reasons motivating their use of self-medication; and the types of medication most used despite not having a prescription. After the questionnaire was developed and translated from English into Arabic by professional translators, it was validated and reliability tested by conducting a pilot study with 30 university students from different colleges at Umm Al-Qura University. Ultimately, Cronbach's alpha coefficient was calculated to be 0.78.

For this study, the questionnaire was formatted for online use in Google Forms and posted on social media platforms (i.e., Facebook, Twitter, and LinkedIn). The link to the questionnaire was also sent to the email addresses and WhatsApp groups and other social media platforms to reach the student population of the targeted universities. After two weeks, a reminder was sent to the target population and data collection continued for one more week until the required sample was reached after about 3 weeks.

Ethical Considerations

Prior to data collection, ethical approval was obtained from the Ethical Review Board of Umm Al-Qura University (HAPO-02-K-012-2022-06-1139). During the study itself, we explained the purpose of the study in the first section of the questionnaire. We also informed prospective participants that no identification or personal data would be required and that the data they provide will be confidential and never be used for purposes other than research. All prospective participants were then given the right to participate in or disregard the study, and participants were allowed to withdraw from the study at any time for any or no reason and without penalty. Thus, the students' consent to participate in the study was confirmed by their opting to complete the questionnaire.

Statistical Analysis

The responses from the participants were sent directly to an Excel spreadsheet and imported the version 25.0 of the Statistical Package for the Social Sciences (SPSS) (IBM, Armonk, NY, USA). Qualitative data were processed as frequencies and percentages. A chi-squared test was used to compare the medical and non-medical university students' responses to the questionnaire items. All p values less than 0.05 were considered to indicate statistical significance.

3 RESULTS

Table 1, shows that 418 students completed the survey and were included in our analysis. Most of the participants were males (56.5%), were aged 21–23 years (48.3%), and were medical students (61.7%). Details about the students' sociodemographic data appear in Table 1.

Table 1 Sociodemographic data and prevalence of self-medication among students (N = 418) at Umm Al-Qura and Al-Baha Universities in south western Saudi Arabia

Variable		Frequency N (%)
Gender	Male	236 (56.5)
	Female	182 (43.5)
Age group	18–20 years	151 (36.1)
	21–23 years	202 (48.3)
	24–26 years	46 (11.0)
	≥27 years	19 (4.5)
University	Umm Al-Qura	229 (54.8)
	Al-Baha	189 (45.2)
Type of study	Medical	258 (61.7)
	Non-medical	160 (38.3)
Level of study	1st–3rd years	206 (49.3)
	4th–6th years	212 (50.7)
Self-medication practice in the past 6 months	Never	108 (25.8)
	Infrequent	142 (34.0)
	Frequent	168 (40.2)
Distance from the nearest medical facility	5–25 min	355 (84.9)
	26–60 min	58 (13.9)
	>60 min	5 (1.2)

Table 2 shows the prevalence of practicing self-medication as reported by the studied participants. The majority of students at both Umm Al-Qura and Al-Baha Universities reported practicing self-medication, 74.2% and 74.1, respectively. By gender, 75.8% of females reported self-medicating compared to 72.9% of males; while comparing the student from medical and non-medical faculties, 74.8% of medical students and 73.1% of non-medical students reported self-medicating practice. However, none of the differences shown in Table 2 were statistically significant.

Table 2 Prevalence of self-medication practice among students (*N* = 418) at Umm Al-Qura and Al-Baha Universities, in south western Saudi Arabia

		Have self-medicated (n = 310, 74.2%)	Have never self-medicated (n = 108, 25.8%)	p
University	Umm Al-Qura (n = 229)	170 (74.2)	59 (25.8)	0.529
	Al-Baha (n = 189)	140 (74.1)	49 (25.9)	
Gender	Male (n = 236)	172 (72.9)	64 (27.1)	0.285
	Female (n = 182)	138 (75.8)	44 (24.2)	
Type of student	Medical (n = 258)	193 (74.8)	65 (25.2)	0.393
	Non-medical (n = 160)	117 (73.1)	43 (26.9)	

Figure 1 illustrates the distribution of the studied students who practiced self-medication according to their universities, gender and faculty. In all the comparisons, however, being not significantly different, the reported self-medication practice by the participating students accounted for nearly, three-quarters (>70%) for Umm Al-Qura and Al-Baha, males and females, and medical and non-medical students.

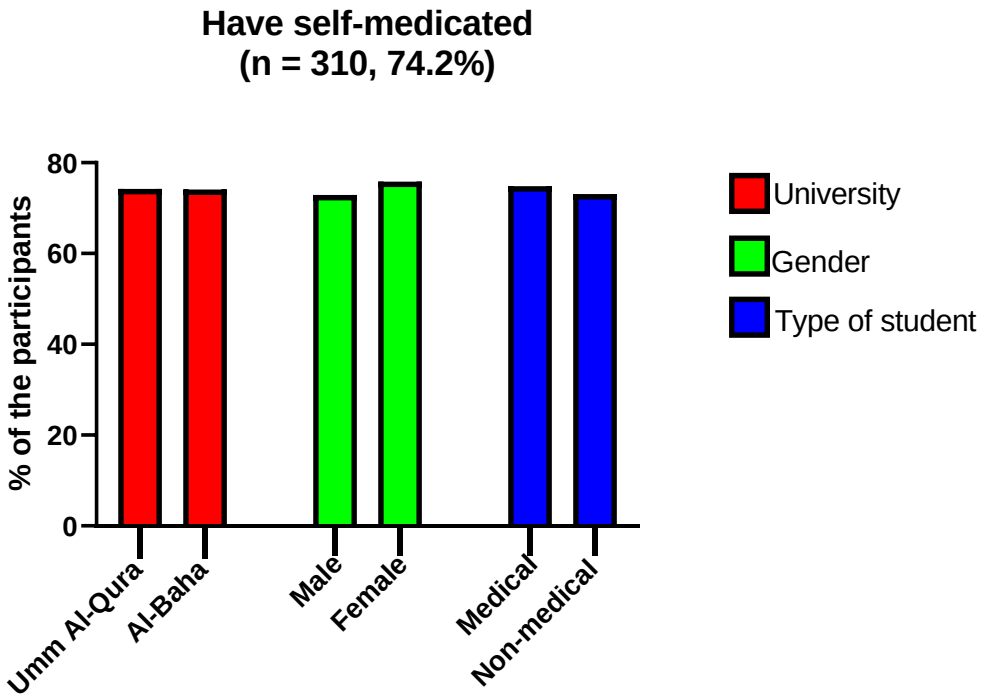

Figure 1 Self-medication practicing students (*N* = 310) compared according to Umm Al-Qura and Al-Baha Universities, gender, and type of faculty (medical or non-medical).

Table 3 shows that most students reported knowing whether the medication (s) that they consume require a prescription (55.5%) and the difference in responses regarding questions 2, 4 and 5 (knowledge and practice) between the students of both universities was statistically significant. Table 3 also highlights that 15.8% of the participants preferred to obtain antibiotics for self-medication. Table 4 shows that most participants (88%) reported understanding the risks of self-medication, likely because they do not consider the practice to be safe, and, on that count, the difference between the medical and non-medical students was not significant. By

contrast, medical students did have significantly higher levels of knowledge and better practice regarding the self-medication practice. Thus, the medical students' response to questions (1, 2, 4 and 5) was significantly better than that of non-medical students.

Table 3 Comparison of knowledge about, attitude toward, and practice of self-medication between students (N = 418) at Umm Al-Qura and Al-Baha Universities

Questions		Total n (%)	Umm Al-Qura (n = 229, 54.8%) n (%)	Al-Baha (n = 189, 45.2%) n (%)	p
1. Do you know whether the medicines you consume need a prescription?	*Yes* *No*	232 (55.5) 186 (44.5)	123 (53.7) 106 (46.3)	109 57.7) 80 (42.3)	0.238
2. Do you know the potential adverse drug reactions of the drug(s) that you use when self-medicating?	*Yes* *No*	241 (57.7) 177 (42.3)	108 (47.2) 121 (52.8)	133 70.4) 56 (29.6)	0.001
3. Do you think that self-medication is safe?	*Yes* *No*	50 (12.0) 368 (88.0)	32 (14.0) 197 (86.0)	18 (9.5) 171 (90.5)	0.106
4. When you self-medicate, do you read the drug information provided before using the medication?	*Yes* *No*	188 (45.0) 230 (55.0)	89 (38.9) 140 (61.1)	99 (52.4) 90 (47.6)	0.004
5. Do you prefer antibiotics obtained for self-medication?	*Yes* *No*	66 (15.8) 352 (84.2)	44 (19.2) 185 (80.8)	22 (11.6) 167 (88.4)	0.023

Table 4 Comparison of knowledge, attitude, and practice of self-medication between medical and non-medical students (N = 418)

Question		Total responses, n (%)	Medical (n = 258, 61.7%) n (%)	Non-medical (n = 160, 38.3%) n (%)	p
1. Do you know whether the medicines you consume need a prescription?	*Yes* *No*	232 (55.5) 186 (44.5)	176 (75.9) 82 (44.1)	56 (24.1) 104 (55.9)	0.001
2. Do you know the potential adverse drug reactions of the drug(s) that you use when self-medicating?	*Yes* *No*	241 (57.7) 177 (42.3)	180 (74.7) 78 (44.1)	61 (25.3) 99 (55.9)	0.001
3. Do you think that self-medication is safe?	*Yes* *No*	50 (12.0) 368 (88.0)	27 (54.0) 231 (62.8)	23 (46.0) 137 (37.2)	0.149
4. Do you read the drug information provided before you self-medicate?	*Yes* *No*	188 (45.0) 230 (55.0)	132 (70.2) 126 (54.8)	56 (29.8) 104 (45.2)	0.001
5. Do you prefer antibiotics obtained for self-medication?	*Yes* *No*	66 (15.8) 352 (84.2)	27 (40.9) 231 (65.6)	39 (59.1) 121 (34.4)	0.001

Table 5 shows the medications that students reported self-medicating with, as well as their causes, source of information, and symptoms and general reasons that encouraged them to self-medicate. Pain killers were the most reported medication used without prescriptions among both medical (48.2%) and non-medical (40.4%) students. The primary reason for self-medicating—to save time—was also the same for both medical (40.3%) and non-medical students (38.9%). However, the primary source of information about self-medication for medical students was personal experience (44.0%), and for non-medical students, it was relatives (49.6%). Last, the primary symptoms motivating students to self-medicate also differed by the type of student: flu for the medical students (23.9%) and headache for the non-medical students (28.2%).

Table 5 Self-medication, causes, source of information, and symptoms that encouraged the medical and non-medical students to practice self-medication (*n* = 310).

Self-medication overview	Total	Medical (n = 193)	Non-medical (n = 117)	p
Medications frequently used without prescription				
Painkillers	149 (48.2)	78 (40.4)	72 (61.5)	0.002
Antihistamines	65 (21.0)	51 (26.4)	14 (12.0)	
Anti-flu medications	34 (11.0)	20 (10.4)	14 (12.0)	
Anti-fever medications	17 (5.5)	16 (8.3)	1 (0.9)	
Antibiotics	14 (4.5)	8 (4.1)	6 (5.1)	
Anti-cough agents	12 (3.9)	8 (4.1)	4 (3.4)	
Antacids	7 (2.3)	5 (2.6)	2 (1.7)	
Vitamins and supplements	6 (1.9)	4 (2.1)	2 (1.7)	
Antidiarrheal medications	2 (0.6)	0 (0.0)	2 (1.7)	
Dermatological treatments	2 (0.6)	2 (1.0)	0 (0.0)	
Eye or ear drops	1 (0.3)	1 (0.5)	0 (0.0)	
Reasons for self-medicating				
To save time	125 (40.3)	75 (38.9)	50 (42.7)	0.044
Only mild symptoms	62 (20.0)	42 (21.8)	20 (17.1)	
Previous experience	46 (14.8)	35 (18.1)	11 (9.4)	
Financial reasons	45 (14.5)	22 (11.4)	23 (19.0)	
Privacy	18 (5.8)	9 (4.7)	9 (7.7)	
No health facility nearby	14 (4.5)	10 (5.2)	4 (3.4)	
Sources of information about drugs used when self-medicating				
Relatives	107 (34.5)	49 (25.4)	58 (49.6)	0.001
Personal experience	104 (33.5)	85 (44.0)	19 (16.2)	
Medical advice without prescription	31 (10.0)	24 (12.4)	7 (6.0)	
Pharmacist	27 (8.7)	19 (9.8)	8 (6.8)	
Friends	22 (7.1)	8 (4.1)	14 (12.0)	
Media or social media	19 (6.1)	8 (4.1)	11 (9.4)	
Symptoms motivating self-medication				
Flu symptoms	74 (23.9)	48 (24.9)	26 (22.2)	0.09
Headache	73 (23.5)	40 (20.7)	33 (28.2)	
Gastrointestinal problems	31 (10.0)	19 (9.8)	12 (10.3)	
Cough	30 (9.7)	24 (12.4)	6 (5.1)	
Menstrual disturbance	24 (7.7)	13 (6.7)	11 (9.4)	
Acne vulgaris	18 (5.8)	11 (5.7)	7 (6.0)	
Allergy	16 (5.2)	13 (6.7)	3 (2.6)	
Fever	15 (4.8)	7 (3.6)	8 (6.8)	
Dental pain	13 (4.2)	5 (2.6)	8 (6.8)	
Body ache	9 (2.9)	7(3.6)	2 (1.7)	
Insomnia	7 (2.3)	6 (3.1)	1 (0.9)	

4. DISCUSSION

Our study showed that 74.2% of the participating students practiced self-medication, which is a lower rate than found in several previous national research investigated in Saudi Arabia. A survey performed in Qassim among 354 males attending university revealed an approximately 86.6% prevalence of self-medication (Al-Worafi et al., 2014). In another study conducted in Abha at King Khalid University among 528 students of both genders, the prevalence was nearly 98.7% (Alshahrani et al., 2019). Although the

variation in the results can be attributed to different sample sizes and cultures between Saudi cities, highly similar results were found in another study conducted in Al-Medina Al-Munawarah, where the prevalence of self-medication in the population of primary health care professionals was 74.7% (Allam and Amer, 2020). By contrast, various international studies have shown a remarkably less prevalent practice of self-medication. The average prevalence was 36.8% in Ethiopia; 57.05% in West Bengal, India; 35.7% in Tehran, Iran; and 52.6% in Iraq (Ahmed andSulaiman, 2016; Ayalew, 2017; Banerjee & Bhadury, 2012; Purreza et al., 2013). Such variation could be due to many factors, including socioeconomic factors, cultural factors, and age differences between the targeted samples, and variations in governmental health policies.

According to the results of our research, self-medication prevalence was slightly higher among medical than non-medical students, however, this difference was not statistically significant. Such findings were consistent with the results of other studies conducted in Brazil and Slovenia (Corrêa Da Silva et al., 2012; Klemenc-Ketis et al., 2010). At the same time, the higher frequency of self-medication among medical students was significant in other national studies and could be explained by their higher level of medical and pharmaceutical knowledge, as well as greater access to medication, health care workers and hospital facilities, than non-medical students (Aljaouni et al., 2015; Alshahrani et al., 2019).

Among our other results, most students reported knowing that the medications that they were consuming needed a prescription (55.5%). The difference between students' responses at Umm Al-Qura University versus Al-Baha University was not statistically significant. Even so, students at Al-Baha University had statistically significant responses to the questionnaire's questions addressing knowledge about, attitude toward, and practice of self-medication than their peers at Umm Al-Qura University. That difference could be attributed to the geographical, educational, and cultural differences between the two universities, which are located in different regions of Saudi Arabia. We also found that only 4.5% of the participating students reported self-medicating with antibiotics. That rate was far less than rates found in other studies, which revealed that the prevalence of self-medicating with antibiotics was approximately 28.2% in Saudi Arabia, 39.5% in Jordan, and 56% in Abu Dhabi in the United Arab Emirates (Abasaeed et al., 2009; Alshahrani et al., 2019; Sawair et al., 2008). The low percentage of antibiotics use in our study might be due to new laws enacted by the Ministry of Health in 2018 that have illegalized the dispensing of antibiotics without prescriptions (MOH, 2022).

Additionally, the results of our research showed that the vast majority of the medicines reportedly used when self-medicating were painkillers, which represented approximately 40.4% of responses from the medical students and 61.5% responses from the non-medical students. This result aligns with previous findings of several national and international studies, (Alshahrani et al., 2019; Ibrahim et al., 2014; Lukovic et al., 2014; Zafar et al., 2008) and could be explained by the fact that many painkillers are categorized as over-the-counter medications and are available outside pharmacies. We additionally found that the leading reported cause of practicing self-medication—to save time—was nearly, the same for both medical students (38.9%) and non-medical students (42.7%). The primary source of information about self-medication was the personal experience for medical students (44.0%) but relatives for non-medical students (49.6%). This distinction may be attributable to the fact that medical students have knowledge about and experience with using medications, whereas non-medical students, without such knowledge, have defaulted to relying on their relatives' advice. This result is congruent with the results of the research conducted at King Khalid University (Alshahrani et al., 2019).

Last, regarding symptoms that drove students to practice self-medication, the primary ones were flu for medical students (23.9%) and headache for non-medical students (28.2%). Other studies have shown partial consistency and primarily highlighted that fever, headache, and common cold were the leading symptoms justifying self-medication (Al-Nadaf and Awadallah, 2020; Banu et al., 2020; Elmahi et al., 2022; Ramadan, 2022). Cultural differences could affect the primary symptoms leading to self-medication. For example, it has been found that some practices of self-medication derive from symptoms related to alcohol consumption (e.g., hangover) (Badiger et al., 2012); however, those reasons do not apply in countries such as Saudi Arabia that have outlawed alcohol consumption.

5 CONCLUSION

Self-medication is prevalent among both medical and non-medical students at both Umm Al-Qura and Al-Baha Universities, in south western Saudi Arabia. Although the prevalence was similar among medical and non-medical students, differences between the groups emerged regarding medical indications and the type of drugs used. Medical schools and universities, in general, should improve students' awareness of the consumption of prescription-only drugs such as antibiotics and their health consequences. Beyond that, the dispensing of medications needs to be controlled by Saudi health authorities by developing effective preventive and interventional strategies.

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Author's contribution
Mahdi H. Alsugoor: Corresponding author who started the idea and wrote the paper.
Naif Alsuhaymi: manuscript review and proofreading
Yousef Alshahrani: manuscript review and proofreading
Yahya H. Alsagoor: data collection and manuscript general comments
Atheer M. Alghamdi: data collection and manuscript general comments
Samer M. Alalawi: data collection and manuscript revision
Shadi B. Alalawi: data collection and proofreading
Fahad A. Alothayqi: data collection proofreading
Mohammed M. Alamri: data collection and analysis
Ashraf Ewis: statistical analysis, interpretation of the results with revising and approval of the final version of the manuscript.

Ethical approval
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Conflicts of interest
The authors declare that there are no conflicts of interests.

Data and materials availability
All data associated with this study are present in the paper.

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