

Evaluation of Self-Medication Among Non-Medical Lebanese International University Students in Sana'a City, Yemen

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ABSTRACT

Background: Self-medication, especially among college students, is becoming a major global public health concern. Nevertheless, nothing is known about its frequency among Yemeni non-medical students. **Objectives:** To evaluate self-medication practices among non-medical students at the Lebanese International University (LIU) in Sana'a, Yemen. **Materials and Methods:** A cross-sectional study was carried out from October to November of 2022. 500 eligible students were given a structured, self-administered questionnaire; 320 valid replies (response rate of 64.6%) were examined. Sociodemographic information, self-medication behaviors, common indications, therapeutic classes used, and reasons influencing the practice were evaluated. descriptive statistics and Chi-square tests were used to assess the data. **Results:** 37.81% of students reported using self-medication in the previous year, with the most common diseases treated with self-medication being headache (80.94%) and common cold (69.06%). The most often utilized therapeutic classes were antipyretics (55.31%) and anti-inflammatory medications (77.81%). Significant gender disparities were found, whereas females were more likely than males to read pharmacological information ($p=0.001$) and practice self-medication (>5 times), whereas males were more likely to seek pharmacists ($p=0.004$). The belief that the health issue was not dangerous was the main driver of self-medication (79.06%). The dangers of overdosing were well-known (91.88%), but the risks of reducing the dosage were less well-known (44.69%). **Conclusion:** LIU non-medical students frequently self-medicate, mostly for mild illnesses. There are still gaps in knowledge about antibiotic use and dosage safety, despite a reasonable awareness of the hazards in general. Targeted educational interventions and strengthened regulatory oversight are recommended.

Keywords: Lebanese International University, Non-medical Students, Practices, Prescription drug misuse, Self-medication, Yemen.

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INTRODUCTION

Self-medication (SM) has become a common phenomenon and has garnered global attention in recent years due to the challenges it poses to all countries, and it is an increasingly growing public health issue (Behzadifar *et al.*, 2020). Operationally, SM is defined as the use of medications without prior medical consultation regarding the indications for use, dosage, or duration of treatment (WHO, 1998). The World Health Organization (WHO) has recognized that using self-medication appropriately as part of self-care can improve an individual's health. As a practical means

of treating minor illnesses that don't need medical attention. However, improper SM practices can have major repercussions including delayed diagnosis, adverse reactions, the possibility of pharmaceutical interference, inappropriate medication selection, abuse, substance dependency, overdosing, drug resistance, the development of co-morbidities, and in certain situations, death (Mamo *et al.*, 2018). Young people are particularly susceptible to the prevalence of SM. Due to variables like academic stress, newfound freedom, and the perception that the disease is mild, students in particular may have limited access to official health care services (Behzadifar *et al.*, 2020). Other studies cited more widespread causes, such as prior experience, time and money savings, minor illnesses, the desire for immediate relief, recommendations from friends or family, self-assurance, the ease of obtaining medications, dissatisfaction with health care, and rudeness of healthcare providers (Idoko *et al.*, 2018; Gelayee, 2017; Bekele *et al.*, 2016; Musa *et al.*, 2016). According to a systematic



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review study, the prevalence of SM among college students ranged from 7.9% to 99%, with an overall frequency of 70.1% (95% CI: 64.3-75.4). Stratifying according to the income level of the country, the prevalence was 71.8% and 67.2% in middle- and low-income countries, respectively. And based on region, the highest prevalence was in Oceania (91.7%) and Asia (71.7%), and higher in medical students (97.2%) than non-medical students (44.7%) (Behzadifar *et al.*, 2020). Compared to pupils from other nations, Asian students were more likely to self-medicate. These variations in prevalence can be explained by cultural, ethnic, economic, and social factors. The prevalence of SM may rise as a result of inadequate supervision systems for drug purchases, easy access to pharmaceuticals, some students' lack of insurance, and false beliefs about using medications without a prescription (Azami-Aghdash *et al.*, 2015). In Yemen, many medications are given out without any medical oversight. Drugs such as antibiotics and some psychiatric treatments, are widely available and simple to purchase without a prescription (Albawani *et al.*, 2017a). SM is very common (90.7%), according to a recent study done in Sana'a, Yemen. The study also found that consumers' lack of trust in the Ministry of Health (70.5%), doctors (68.8%), community drug dispensers (78.2%), and the quality of medicine dispensed by community pharmacies (59.7%) all have a significant impact on the use of medications without a prescription (Albawani *et al.*, 2017b). Nevertheless, there is little data on Yemeni university students' SM. Therefore, this study aimed to assess the use of SM among non-medical Lebanese international university students in Sana'a, Yemen.

MATERIALS AND METHODS

Study Design and Setting

This study was a descriptive, cross-sectional study conducted at the Lebanese International University (LIU) in Sana'a city, Yemen. Data was gathered at a number of student-frequented campus places, such as lecture rooms, the library, the canteen, and student rest areas. The non-medical faculties at LIU, such as the Faculty of Business and Information Sciences, the Faculty of Engineering and Technology, the Faculty of Languages, and the Faculty of Arts, were the focus of the study. Twenty days, from October 24 to November 12, 2022, were allotted for data collecting in order to guarantee sufficient representation and data dependability.

Study Population and Eligibility Criteria

Undergraduate and postgraduate students enrolled at LIU made up the target population. Only students enrolled in non-medical faculties met the inclusion requirements.

Sample Size and Sampling Technique

The study used a convenience sampling technique to find volunteers. The sample size was calculated using the formula

for cross-sectional studies: $n = (Z^2 \times p \times q) / d^2$, where $Z = 1.96$ (95% confidence level), $p = 0.5$ (estimated prevalence for maximum sample size), $q = 0.5$, and $d = 0.05$ (margin of error). This yielded a minimum required sample size of 384 participants. To account for potential non-response and incomplete data, we distributed 500 questionnaires, resulting in 320 valid responses (64.6% response rate). This sample size was deemed adequate for statistical analysis.

Data Collection Instrument

A standardized, self-administered questionnaire printed in Arabic was used to gather data. The questionnaire was developed based on a comprehensive review of similar studies on self-medication among university students (Behzadifar *et al.*, 2020; Alshahrani *et al.*, 2019; Zafar *et al.*, 2008) and adapted to the local context. The instrument was translated into Arabic and underwent face and content validity assessment by three pharmacy faculty members. A pilot study was conducted on 20 students (subsequently excluded from the main study) to assess clarity, comprehension, and internal consistency. Cronbach's alpha was calculated to assess reliability ($\alpha = 0.78$), indicating acceptable internal consistency. There were four separate sections on the questionnaire: Demographic information: Age, gender, and academic year were among the baseline data gathered in this area. The existence, frequency, and length of self-medication practices during the previous 12 months were evaluated in Part 1 (Self-Medication Practices). Additionally, it investigated the origins of students' medications and their overall opinions regarding the safety of self-medication. The precise therapeutic classes of medications that are frequently used for self-medication were listed in Part 2 (Drugs and Indications), together with the medical problems (indications) for which they were prescribed. Part 3 (Factors Influencing Practice): This portion assessed the factors that influence the decision to self-medicate, including reasons favoring the practice and reasons for seeking professional help. Students' attitudes and knowledge about particular facets of the hazards and safety of self-medication were evaluated in Part 4 (Students' Views).

Statistical Analysis

Statistical software was used to enter and evaluate the data (SPSS, version 20). Demographic traits and self-medication behaviors were compiled using descriptive statistics, such as frequencies and percentages. To compare categorical variables, including self-medication habits by gender and academic year, the chi-square test was utilized. P-values below 0.05 were regarded as statistically significant. It is important to note that multiple comparisons were performed without adjustment (e.g., Bonferroni correction), which may increase the risk of Type I errors. Therefore, the findings should be interpreted with caution.

Ethical Considerations

The study adhered to ethical standards for Helsinki Declaration. Ethical approval was obtained from the LIU Research Ethics Committee. Verbal informed consent was taken from all the participants. The purpose of the study and information about confidentiality and anonymity, and that participation was voluntary and they could withdraw from the study were included in the cover letter of the questionnaire. No personal identifiers were collected.

RESULTS

The sociodemographic characteristics

The sociodemographic characteristics of the 320 participating non-medical students are presented in Table 1. With 156 males (48.75%) and 164 females (51.25%) in the sample, the gender distribution was almost equal. Students in their third year made up the highest percentage of the sample (30.62%), followed by those in their second year (24.37%), first year (21.56%), and fourth year (20.63%). Only 2.82% of participants were postgraduate students, making them the smallest group.

The comparison of SM behaviors by gender

The comparison of SM behaviors by gender is shown in Table 2. Statistically significant associations were observed in certain behaviors, although the overall percentage of SM in the past year was the same for both genders at 37.81% ($p=0.590$). The prevalence of SM without a prescription was substantially greater among male (43.44%) than among female (42.19%) ($p=0.035$). A highly significant difference was observed in the frequency of practice ($p<0.001$), where females reported practicing SM more than five times (20.94%) at a higher rate than males (8.44%). Females were far more probably than males to read about the drug before using it (31.25% vs. 20.31%, $p=0.001$) and to be aware of the probable negative effects (29.69% vs. 21.25%, $p=0.014$). On the other hand, males were considerably more probably to consult a pharmacist prior to SM (38.44% vs. 32.81%, $p=0.004$). Males reported higher consumption (4.38%) than females (3.44%), indicating a significant difference in the market-sourced drugs ($p=0.049$). There were no discernible gender differences in the use of antibiotics as SM or the perception that SM can be hazardous.

The medical disorders and treatment classifications

Figure 1 illustrates the distribution of medical conditions, where the headache was the most common ailment (80.94%), followed by common cold (69.06%), fever (61.25%), and cough (55.94%). Correspondingly in Table 3, anti-inflammatory medications (77.81%) were the most utilized therapeutic class, followed by antipyretics (55.31%), decongestants (53.13%), and cough syrups (53.13%).

The common reasons and student's views on self-medication

The factors impacting SM behaviors and students' opinions on safety are listed in Table 4. The idea that the health issue was not dangerous (79.06%) was the main factor supporting SM. This was followed by the belief that the disease was easy (64.06%) and the wish to avoid lengthy clinic wait times (55.63%). On the other hand, the primary reasons for seeking professional assistance were the existence of significant pain (81.25%) and symptoms that persisted for more than a week (60.94%). In terms of hazards, 58.75% of students mentioned the danger of using the wrong medications, while 60% of students mentioned adverse effects. As well as, students showed strong agreement that taking more medication could be dangerous (91.88%) and that taking different medications together could be harmful (85.31%). However, there is a discrepancy in knowledge about dosage adjustments, since only 44.69% of respondents agreed that lowering the dose could be dangerous (Supplementary Table 1).

DISCUSSION

This study investigated self-medication practices among non-medical students at the Lebanese International University (LIU) in Sana'a city, Yemen. The results show that self-medication practices are quite prevalent, with notable differences between gender and particular behavioral patterns. The study sample consisted of 320 non-medical students with almost equal distribution of males (48.75%) and females (51.25%). The total prevalence of self-medication practices for both genders during the previous 12 months was 37.81%. This result is less than the global pooled prevalence of self-medication among college students, which a systematic review and meta-analysis found to be 70.1% (Behzadifar *et al.*, 2020). In the same way, a Saudi Arabian study revealed a spread of 81.6% among college students (Bin Abdulrahman *et al.*, 2024). Our study's lower spread could be explained by variations in research methods, the precise definition of self-medication utilized, or Yemeni-specific cultural considerations. Nevertheless, our study results are more in line

Table 1: Sociodemographic characteristics of non-medical students, Lebanese international university, Sana'a city, Yemen ($n=320$).

Variable	Frequency	Percentage
Gender		
Male	156	48.75
Female	164	51.25
Year of study		
1 st year	69	21.56
2 nd year	78	24.37
3 rd year	98	30.62
4 th year	66	20.63
Postgraduate	9	2.82

Table 2: Comparison of student's self-medication practice in the past year with gender.

Items	Male		Female		Chi-Square	Odds Ratio	P value
	No.	%	No.	%			
SM in the past year							
Yes	121	37.81	121	37.81	0.28	1.23	0.590
No	35	10.94	43	13.44			
SM without prescription							
Yes	139	43.44	135	42.19	4.44	1.76	0.035*
No	17	5.31	29	9.06			
Frequency for SM							
None	13	4.06	6	1.88	23.6	-	<0.001*
1-3 Times	52	16.25	56	17.5			
4-5 Times	26	8.13	12	3.75			
> 5 Times	27	8.44	67	20.94			
Long period for SM							
None	11	3.44	12	3.75	6.87	-	0.076
1-3 Days	92	28.75	81	25.31			
4-6 Days	45	14.06	43	13.44			
≥ Week	17	5.31	32	10			
I have an idea of rational use of SM							
Yes	87	27.19	100	31.25	1.02	0.81	0.310
No	69	21.56	64	20			
SM is mitigating symptoms but doesn't address the reasons							
Yes	102	31.88	114	35.63	0.33	0.83	0.560
No	54	16.88	50	15.63			
Learn the expected side effect of SM							
Yes	68	21.25	95	29.69	6.09	0.56	0.014*
No	88	27.5	69	21.56			
Read about the drug when I practice SM							
Yes	65	20.31	100	31.25	10.03	0.46	0.001*
No	91	28.44	64	20			
Sources of obtaining medication during SM							
Community pharmacy	118	36.88	102	31.88	9.52	-	0.049*
House pharmacy	30	9.38	41	12.81			
Market	14	4.38	11	3.44			
Herb store	11	3.44	27	8.44			
Friends	18	5.63	14	4.38			
I speak to pharmacist before SM							
Yes	123	38.44	105	32.81	8.23	2.09	0.004*
No	33	10.31	59	18.44			

*Significant at p value <0.05.

with a Nigerian study that found 49.41% a spread of university students (Fetensa *et al.*, 2021). The disparity in prevalence rates between research emphasizes the impact of cultural attitudes on self-care behaviors, economic circumstances, and regional

healthcare accessibility (Behzadifar *et al.*, 2020). The gender difference in the frequency of self-medication activities was a significant finding of this study ($p < 0.001$). Compared to male students (8.44%), female students were more likely to self-medicate

Table 3: Therapeutic classes reported in self-medication practices of LIU students, Sana'a city, Yemen (n=320).

Drug classes	Yes		No	
	<i>n</i>	(%)	<i>n</i>	(%)
Anti-inflammatory	249	77.81	71	22.19
Antipyretic	177	55.31	143	44.69
Cough syrup	170	53.13	150	46.88
Decongestant preparations	170	53.13	150	46.88
Vitamins	150	46.88	170	53.13
Eyes/ear/nose drops	108	33.75	212	66.25
Complementary nutrients	88	27.50	232	72.50
Anti-stomach inflammation	79	24.69	241	75.31
Inflammatory local drugs	63	19.69	257	80.31
Anti-diarrheal	56	17.50	264	82.50
Anti-emetic	53	16.56	267	83.44
Constipation	45	14.06	275	85.94
Appetizers	36	11.25	284	88.75
Herbs	28	8.75	292	91.25
Complementary energy	27	8.44	293	91.56
Oral contraceptives	10	3.13	310	96.88

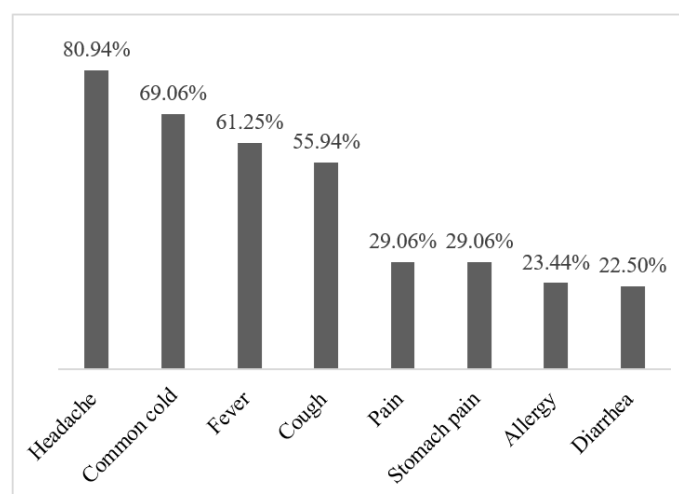
more than five times (20.94%), which is in line with WHO EMRO systematic review that found female students self-medicate more frequently than male students (Behzadifar *et al.*, 2020). Similar trends have been found in Slovenia, where 90.9% of male students and 94.1% of female students reported self-medication; however, the difference was not statistically significant (Klemenc-Ketiš and Kersnik, 2011). Greater health knowledge, more common mild illnesses, or a greater willingness to disclose health behaviors are some of the possible explanations for the higher prevalence among females (Waqar *et al.*, 2019). Furthermore, women could feel more at ease handling minor medical ailments on their own or have easier access to household drugs (Tripković *et al.*, 2020). Compared to male students, female students were more likely to read about medications before using them ($p=0.001$) and showed much higher awareness of potential side effects ($p=0.014$). In contrast, gender disparities in knowledge were not statistically significant across KAP dimensions in certain MENA research (Tan *et al.*, 2025). Nonetheless, it is consistent with studies that indicate female students typically display more circumspect health habits and information seeking tendencies (Alzoubi *et al.*, 2023). It's interesting to note that male students were substantially more likely than female students to speak with pharmacists prior to self-medication (38.44% vs. 32.81%, $p=0.004$). This may suggest that men prefer expert assistance when it is available, whereas women obtain knowledge more independently. Other studies conducted in the Middle East have noted this tendency, with pharmacist consultation differing according on accessibility and gender (Alshahrani *et al.*, 2019). With 28.13% of males and 24.38% of females reporting antibiotic self-medication, there was

no significant gender difference in these behaviors ($p=0.063$). Given the threat of antibiotic resistance to global public health, this incidence is alarming. According to a systematic review, university students in low- and middle-income countries are very likely to self-medicate with antibiotics (Xu *et al.*, 2019). High rates of students self-medicating antibiotics have also been reported in studies from China and Iran, with female gender occasionally being linked to greater rates (Zhu *et al.*, 2016; Sarahroodi *et al.*, 2010). In Yemen, where regulatory enforcement of prescription requirements may be inadequate, the lack of substantial gender differences in our study may be a reflection of ubiquitous access patterns to antibiotics (Albawani *et al.*, 2017a). Regardless of gender, this data emphasizes the need for focused efforts to address antibiotic abuse. The study discovered that the majority of self-medication behaviors, such as using antibiotics ($p=0.470$), practicing without a prescription ($p=0.750$), and practicing within the previous year ($p=0.710$), did not differ much between academic years. This conclusion runs counter to some research that suggests senior students' self-medication practices differ because of their considerable health knowledge (Patel *et al.*, 2025). Nonetheless, it is consistent with studies showing that self-medication habits are formed early and hold steady during college years (Helal & Abou-ElWafa, 2017). One possible explanation for this could be that university students, both medical and nonmedical, do not care much about the consequences of such behavior and therefore do not hesitate to engage in such activities (Zafar *et al.*, 2008). Another possibility is that nonmedical students believe they are as knowledgeable about medications as medical students (Zafar *et al.*, 2008). Regarding

Table 4: Common reasons and Student's views on self-medication (n=320).

Common reasons for SM	Agree		Disagree	
	n	(%)	n	(%)
Reasons in favour of SM				
Health problem not risky	253	79.06	67	20.94
Simple illness	205	64.06	115	35.94
Avoid clinic wait times	178	55.63	142	44.38
Increase the cost of appointments	104	32.5	216	67.5
Suggestion of friends/relative	67	20.94	253	79.06
Doctors' advice in herb treatment	51	15.94	269	84.06
Feeling shy of disease symptoms discussion	15	4.69	305	95.31
Reasons for seeking professional help				
Present severe pain	260	81.25	60	18.75
Symptoms last more than a week	195	60.94	125	39.06
Complication of disease	118	36.88	202	63.13
Long treatment ineffective	83	25.94	237	74.06
Thinking there something risky	71	22.19	249	77.81
Side effect from long treatment	50	15.63	270	84.38
Student's views on self-medication				
All drugs (in prescription, without prescription, or herbs) have side effect	256	80	64	20
Overdosing is risky	294	91.88	26	8.13
Drug combinations are risky	273	85.31	47	14.69
Reducing dose is risky	143	44.69	177	55.31
Physicians required. consultate in side effect	273	85.31	47	14.69
Small issue not required medicine treatment	274	85.63	46	14.38

the belief that "self-treatment mitigates symptoms but doesn't address the reasons" ($p=0.029$), there was a substantial difference, with fourth-year students exhibiting the highest level of agreement. This could be a result of improved critical thinking abilities and health literacy brought about by scholastic advancement (Bin Abdulrahman *et al.*, 2024). The results imply that, even though behavioral changes take longer to materialize, educational interventions may have a gradual impact on students' comprehension of the constraints associated with self-medication. With regard to common medical conditions, the most medical ailment in the current study was headache (80.94%), followed by fever (61.25%), cough (54.94%), and common cold (69.06%). These results are very in line with the literature from around the world. According to a Pakistani study, the most common symptoms for self-medication were fever (55.2%), flu (65.5%), and headache (72.4%) (Zafar *et al.*, 2008). Similarly, a study conducted in Jordan found that the main reasons why students self-medicate include minor illnesses and emergencies (Malak & AbuKamel, 2019). The prevalence of mild, self-limiting illnesses indicates that students typically save self-medication for illnesses they believe to be trivial. Numerous research conducted in the

**Figure 1:** Medical conditions reported in self-medication practices .

Middle East and around the world have reported this pattern (Zewdie *et al.*, 2020). However, concerns regarding possible misinterpretation of more serious illnesses exhibiting similar symptoms are raised by the high occurrence (Azócar *et al.*, 2023). Additionally, our study showed that the most commonly utilized

therapeutic class was anti-inflammatory medications (77.81%), followed by decongestants (53.13%), cough syrups (53.13%), and antipyretics (55.31%). These results are consistent with trends seen in Saudi Arabia, where the most often prescribed self-medicated medications were analgesics (60.3%) and antibiotics (30.6%) (Aljaouni *et al.*, 2015). The prevalence of pain and fever-related disorders among students is reflected in the increased use of anti-inflammatory and antipyretic drugs. From a public health standpoint, the comparatively low usage of antibiotics (28.13% males, 24.38% females) in comparison to several regional studies is positive but nonetheless cause for concern. Higher rates of students self-medicating and storing antibiotics at home have been shown in studies from Vietnam and other LMICs (Doan *et al.*, 2025). The discrepancy can be due to variations in the availability of antibiotics, prescription procedures, or knowledge of the hazards associated with antimicrobial resistance (Doan *et al.*, 2025). The assumption that the health issue was not dangerous (79.06%), the belief that the condition was easy (64.06%), and the desire to avoid lengthy clinic wait times (55.63%) were the main reasons given for self-medication in this study. These results are in line with several studies that found that accessibility to healthcare and the severity of the illness were important factors (Gebregziabher *et al.*, 2024). According to a study, 74.10% of participants said they self-medicated because they didn't have time to see a doctor (Zewdie *et al.*, 2020). The minor ailment perception has been documented from a variety of cultural contexts as evidence of self-medication justification (Alomoush *et al.*, 2024). Public health education on warning indicators that necessitate expert evaluation is necessary, as this impression may result in a delayed identification of dangerous illnesses (Patel *et al.*, 2025). Additionally, the most common reason for students to seek professional care was extreme pain (81.25%), which was followed by symptoms that persisted for more than a week (60.94%). These care-seeking thresholds are generally reasonable and indicate that students are able to discriminate between problems that need professional care and those that can be handled on their own (Azócar *et al.*, 2023). However, major illnesses that manifest without significant pain may go unnoticed if pain severity is used as the primary signal (Helal & Abou-ElWafa, 2017). Students showed understanding of the perceived dangers of self-medication, with 60% recognizing side effects, 58.75% identifying the risks of incorrect drug usage, and 55.63% acknowledging the risks of misdiagnosis. This understanding is positive and consistent with research indicating that college students are generally aware of the risks associated with self-medication (Castro *et al.*, 2022). The high frequency of self-medication behaviors in spite of risk identification, however, shows that awareness does not necessarily result in behavioral change (Zewdie *et al.*, 2020). High percentage of respondents (91.88%) agreed that raising dosages might be dangerous, 85.31% accepted the risks of drug combinations, and 85.31% acknowledged the dangers of unknown drug contents for

individuals with liver or kidney problems, according to the present study. These results show that LIU students have a high level of health awareness about medication safety. There is a knowledge gap about the risks of under-dosing, too, since only 44.69% of respondents agreed that lowering doses could be dangerous. Other study has seen this asymmetry in awareness, with students focusing more on the risk of overdose than on the possibility of treatment failure due to under-dosing (Alshahrani *et al.*, 2019). This gap should be filled by educational initiatives to encourage a thorough comprehension of dose significance. In our study, students appear to understand the benefits of non-pharmacological treatments for minor ailments, as seen by the high agreement (85.63%) that minor health conditions do not require medical care. From the standpoint of rational drug use, this finding is encouraging and consistent with suggestions to cut down on needless medication use (Behzadifar *et al.*, 2020). It is important to acknowledge that the current study design and the lack of adjustment for potential confounding variables (such as academic year, socioeconomic status, or prior health education) limit the ability to establish causal relationships between the observed variables. There are some differences between our results and those of other Yemeni studies. Compared to our 37.81% prevalence, a study conducted in Shabwah Governorate (located in southern Yemen to east from Aden by about 385 kilometers) found a 69.9% prevalence of self-medication (Hezam & Yousef, 2024). Another in Ibb city (Yemeni city located south of the capital Sana'a with 193 km) where 85% of participants engaged self-medication in the three months before data collection (Mogali *et al.*, 2015). These discrepancies could be the result of methodological inconsistencies in data collecting, regional inequalities in healthcare access, or economic conditions. Saudi Arabian study have revealed conflicting results, with some indicating that prevalence rates are higher among students who are not medical students (Alshahrani *et al.*, 2019). The disparity among Middle Eastern nations emphasizes how national healthcare laws, drug laws, and cultural norms affect the use of self-medication (Khalifeh *et al.*, 2017).

LIMITATIONS OF THE STUDY

It is important to recognize a number of limitations when interpreting these results. First, conclusions concerning the factors impacting self-medication habits are limited by the cross-sectional methodology. The cross-sectional nature of the study prevents causal inferences between variables. As well the convenience sampling method may introduce selection bias, as participants were recruited from specific campus locations (lecture rooms, library, canteen), which may not fully represent the entire student population. So the findings were interpreted with caution regarding generalizability. Second, self-reported statistics might underestimate some actions due to recollection and social desirability biases that may have led to underreporting of certain behaviors, particularly antibiotic misuse or practices

perceived as risky. Third, the study's generalizability to other Yemeni universities or regions was limited because it was carried out at a single university in Sana'a. Fourth, only non-medical students were included in the sample, making it impossible to compare them to medical students, who might have different practices and knowledge levels. Lastly, there is uncertainty regarding the safety and efficacy of reported behaviors because the study did not evaluate the clinical results of self-medication activities.

CONCLUSION

According to the study's findings, self-medication is common among non-medical students at the Lebanese International University in Sana'a. This behavior is mostly motivated by convenience and the perception of the severity of minor illnesses. According to the results, the most prevalent self-treated diseases are headache and cold, which are primarily treated with anti-inflammatory and antipyretic medications. There were notable differences based on gender, with male students showing a larger dependence on pharmacist advice and female students practicing and requesting information more frequently. Even while most students are adequately aware of the hazards associated with medications in general, there is a significant knowledge gap about the possible risks of reducing dosages and continuing to take antibiotics without supervision.

RECOMMENDATIONS

University health administrators are advised to create focused educational initiatives that encourage responsible drug use and antimicrobial stewardship, with a focus on dispelling myths about dosage adjustments. Stricter regulations should be put in place by regulatory bodies to restrict the distribution of prescription-only drugs, especially antibiotics, at neighborhood pharmacies close to campuses. In order to help students, develop safe self-care habits, pharmacists should also be encouraged to take on a more active counseling role. To further improve public health initiatives in Yemen, future research should concentrate on comparison studies between medical and non-medical students as well as longitudinal studies to evaluate the health effects of self-medication. In summary, although university students use self-medication as a coping strategy for minor health concerns, there are possible hazards associated with this practice that call for consideration from educators, medical professionals, and legislators. To safeguard student health and fight antibiotic resistance in Yemen and the wider region, a well-rounded strategy that discourages risky behaviors and encourages proper self-care is crucial.

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ABBREVIATIONS

SM: Self-medication; **LIU:** Lebanese International University; **WHO:** World Health Organization; **SPSS:** Statistical Package for the Social Sciences; **EMRO:** Eastern Mediterranean Regional Office; **MENA:** Middle East and North Africa; **LMIC:** Low- and middle-income countries; **KAP:** Knowledge, Attitude, and Practices.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

Author Contributions: K.A. and A.M. conceptualized the study and designed the methodology. A.M. collected and analyzed the data. Both authors contributed to the writing, reviewing, and editing of the final manuscript.

SUMMARY

Self-medication is prevalent (37.81%) among non-medical university students at the Lebanese International University in Sana'a, Yemen. While students predominantly self-medicate for minor ailments such as headaches and the common cold using anti-inflammatory and antipyretic drugs, significant knowledge gaps remain regarding safe dosing and the risks of non-prescription antibiotic use. The findings highlight the critical need for stricter regulatory oversight and targeted health education campaigns on university campuses.

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Supplementary Table S1: Comparison of student's self-medication practice in the past year with study year.

Items	1 st Y (n=69)		2 nd Y (n=78)		3 rd Y (n=98)		4 th Y (n=66)		Postgrad. (n=9)		Chi-Square	p value
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)		
SM last year	50 (15.6)	19 (5.9)	59(18.4)	19(5.9)	76(23.8)	22(6.9)	52(16.3)	14(4.4)	5(1.6)	4(1.3)	2.11	0.710
Practice SM without prescription	58(18.1)	11(3.4)	66(20.6)	12(3.8)	84(26.3)	14(4.4)	58(18.1)	8(2.5)	8(2.5)	1(0.3)	1.94	0.750
Practice SM can be harmful	30(9.4)	39(12.2)	33(10.3)	45(14.1)	49(15.3)	49(15.3)	29(9.1)	37(11.6)	4(1.3)	5(1.6)	1.83	0.771
Practice times for SM												
None	62(19.4)	7(2.2)	71(22.2)	7(2.2)	87(27.2)	11(3.4)	61(19.1)	5(1.6)	7(2.2)	2(0.6)	5.98	0.652
1-3 Times	48(15.0)	21(6.6)	47(14.7)	31(9.7)	62(19.4)	36(11.3)	48(15.0)	18(5.6)	7(2.2)	2(0.6)		
4-5 Times	60(18.8)	9(2.8)	68(21.3)	10(3.1)	85(26.6)	13(4.1)	58(18.1)	8(2.5)	8(2.5)	1(0.3)		
> 5 Times	37(11.6)	32(10.0)	48(15.0)	30(9.4)	60(18.8)	38(11.9)	31(9.7)	35(10.9)	5(1.6)	4(1.3)		
Long period for SM												
None	63(19.7)	6(1.9)	71(22.2)	7(2.2)	93(29.1)	5(1.6)	62(19.4)	4(1.3)	8(2.5)	1(0.3)	6.41	0.601
1-3 Days	30(9.4)	39(12.2)	41(12.8)	37(11.6)	48(15.0)	50(15.6)	34(10.6)	32(10.0)	6(1.9)	3(0.9)		
4-6 Days	59(18.4)	10(3.1)	56(17.5)	22(6.9)	70(21.9)	28(8.8)	42(13.1)	24(7.5)	5(1.6)	4(1.3)		
≥ Week	55(17.2)	14(4.4)	66(20.6)	12(3.8)	83(25.9)	15(4.7)	60(18.8)	6(1.9)	8(2.5)	1(0.3)		
I have an idea of rational use of SM	36(11.3)	33(10.3)	43(13.4)	35(10.9)	53(16.6)	45(14.1)	51(15.9)	15(4.7)	4(1.3)	5(1.6)		
SM is mitigating symptoms but doesn't address the reasons	48(15.0)	21(6.6)	54(16.9)	24(7.5)	72(22.5)	26(8.1)	89(27.8)	27(8.4)	8(2.5)	1(0.3)	10.74	0.029*
Learn the expected side effect of SM	28(8.8)	41(12.8)	37(11.6)	41(12.8)	53(16.6)	45(14.1)	41(12.8)	25(7.8)	4(1.3)	5(1.6)	3.91	0.421
Read about the drug when I practice SM	38(11.9)	31(9.7)	34(10.6)	44(13.8)	50(15.6)	48(15.0)	39(12.2)	27(8.4)	4(1.3)	5(1.6)	4.88	0.300
Sources of SM												
Community pharmacy	41(12.8)	27(8.4)	53(16.6)	25(7.8)	68(21.3)	30(9.4)	52(16.3)	14(4.4)	6(1.9)	13(4.1)	18.73	0.061*
House pharmacy	17(5.3)	51(15.9)	15(4.7)	63(19.7)	23(7.2)	75(23.4)	15(4.7)	51(15.9)	1(0.3)	8(2.5)		
Market	6(1.9)	62(19.4)	5(1.6)	73(22.8)	10(3.1)	88(27.5)	2(0.6)	64(20.0)	2(0.6)	7(2.2)		
Herb store	11(3.4)	57(17.8)	8(2.5)	70(21.9)	12(3.8)	86(26.9)	7(2.2)	59(18.4)	0	9(2.8)		
Friends	5(1.6)	63(19.7)	4(1.3)	74(23.1)	15(4.7)	83(25.9)	6(1.9)	60(18.8)	2(0.6)	7(2.2)		
I speak to pharmacist before SM	45(14.1)	24(7.5)	57(17.8)	21(6.6)	72(22.5)	26(8.1)	47(14.7)	19(5.9)	7(2.2)	2(0.6)	4.67	0.323
I take antibiotics as SM	39(12.2)	30(9.4)	37(11.6)	41(12.8)	50(15.6)	48(15.0)	37(11.6)	29(9.1)	5(1.6)	4(1.3)	3.54	0.470

SM: self-medication; Y: Year; Postgrad.: Postgraduate; *Significant at p value<0.05.