

Self-Medication Among Medical and Non-Medical Students: A Cross-Sectional Study at Superior University

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Abstract
Background: Self-medication is a prevalent behavior among university students, often driven by accessibility, time constraints, and perceived knowledge. While it can offer quick relief, it also carries significant risks, especially when practiced without adequate awareness.
Objective: This study aimed to assess and compare self-medication practices, perceptions, motivations, and associated factors among medical and non-medical students at Superior University.
Methods: A cross-sectional study was conducted among 699 students using a structured, self-administered questionnaire. Data were analyzed using SPSS, applying descriptive

statistics and chi-square tests to determine associations between variables.

Results: The mean age of respondents was 21.38 ± 2.45 years. Females comprised 61.9% of the participants, and 66.7% were from medical backgrounds. Overall, 64.9% reported self-medicating in the past six months. Headache (58.3%) and pain (15.3%) were the most commonly self-treated conditions, with analgesics (50.8%) and antibiotics (25.8%) as the primary drugs used. Pharmacies (81.3%) were the most common source of medications. Medical students demonstrated significantly higher familiarity with the term self-medication ($p < 0.001$), greater awareness of risks ($p < 0.001$), and a stronger belief in its safety ($p = 0.001$). However, no significant difference was found in overall self-medication prevalence between medical and non-medical students ($p = 0.117$).

Conclusion: Self-medication is widespread among university students, with medical students showing more knowledge yet equal participation in the practice compared to their non-medical peers. Educational interventions promoting rational drug use and awareness of associated risks are strongly recommended.

INTRODUCTION

Self-medication defined as the use of medicines to treat self-recognized illnesses or symptoms without professional consultation is increasingly common among university students worldwide. Although self-medication may offer benefits like timely relief and reduced healthcare costs, it also poses risks such as misdiagnosis, inappropriate drug use, adverse reactions, and antibiotic resistance (1,2).

Recent studies report high prevalence rates of self-medication among university populations, often exceeding 50% (1,3). For instance, a 2025 study among medical undergraduates at Tanta University (Egypt) found a 71% prevalence of self-medication, with analgesics and antibiotics used most frequently; headache emerged as the most common complaint (3). Similarly, a study in Tanzania reported that 49.1% of medical students and 59.2% of non-medical students practiced antibiotic self-medication; non-medical students were more likely to self-medicate with antibiotics (2).

Knowledge gaps between medical and non-medical students also persist. In Tanzania, medical students scored significantly higher on antibiotic self-medication knowledge (mean score 6.4) compared with non-medical students (mean score 5.6; $p < 0.001$), but non-medical students self-medicated more with antibiotics (59.2% vs. 49.1%; AOR 1.6; 95% CI 1.2-2.3) (2).

Globally, a recent Frontiers in Pharmacology study highlighted that availability of antibiotics without prescription, easy pharmacy access, and lack of risk awareness are major drivers of self-medication, and that medical students may overestimate their ability to self-treat based on academic exposure (2). These findings underscore that increased knowledge does not necessarily translate into safer self-medication behaviors.

The COVID-19 pandemic has further influenced self-medication practices, with many students resorting to over-the-counter drugs for perceived relief amid restricted healthcare access (4). This trend is particularly pronounced in low- and middle-income countries where regulatory enforcement is weak and health literacy is variable (5,6).

Despite awareness of potential risks, self-medication remains a prevalent behavior among both medical and non-medical students. Understanding the motivations, perceptions, and influencing factors in these groups is essential for effective policy and educational interventions.

This study aims to assess and compare the prevalence, patterns, motivations, and perceptions of self-medication among medical and non-medical students at Superior University, thereby providing updated insights to inform campus-based health strategies and public health policy.

Methods

Study Design and Setting

This cross-sectional study was conducted at Superior University, Lahore, Pakistan. The study aimed to assess and compare self-medication practices among medical and non-medical undergraduate students.

Study Population and Sampling

The target population consisted of undergraduate students from both medical and non-medical faculties at Superior University. A total of 699 students participated in the study. Students were selected using convenience sampling. Inclusion criteria were enrollment as a full-time undergraduate student and willingness to participate. Students who declined to consent or returned incomplete questionnaires were excluded.

Data Collection Instrument

Data were collected using a structured, self-administered questionnaire developed after a thorough literature review (1-3). The questionnaire was divided into sections covering:

- Demographic characteristics (age, gender, educational background, year of study)
- Familiarity with the term "self-medication" and awareness of potential risks
- Patterns and frequency of self-medication in the past six months
- Perceptions, motivations, and beliefs regarding self-medication

- Types of illnesses treated, medicines used, information sources, and side effects
- The questionnaire was pre-tested on a sample of 30 students to ensure clarity and reliability. Feedback was used to make minor adjustments before formal data collection.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of Superior University. Participation was voluntary, and informed consent was obtained from all respondents. Anonymity and confidentiality were assured, and participants were informed that data would be used solely for research purposes.

Statistical Analysis

Data were entered and analyzed using IBM SPSS Statistics Version 26. Descriptive statistics (mean, standard deviation, frequency, and percentage) were calculated for demographic variables and main outcomes. Cross-tabulation and chi-square tests were used to assess associations between categorical variables such as educational background, gender, year of study, and self-medication practices. A p-value of less than 0.05 was considered statistically significant.

Results

Demographic Characteristics

A total of 699 students participated in the study. The mean age was 21.38 ± 2.45 years (range: 16-28 years). Of these, **266 (38.1%)** were male and **433 (61.9%)** were female. The majority (**466; 66.7%**) were from medical faculties, while **233 (33.3%)** were non-medical students. Distribution by year of study is shown in **Table 1**.

Table 1: Demographic Characteristics of Participants (N=699)

Variable	Frequency (n)	Percentage (%)
Age (mean $\pm$ SD)	21.38 $\pm$ 2.45	
Gender		
Male	266	38.1
Female	433	61.9
Educational Background		
Medical	466	66.7
Non-medical	233	33.3
Year of Study		
1st year	182	26.0
2nd year	154	22.0
3rd year	93	13.3
4th year	178	25.5

5th year	92	13.2
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Familiarity and Awareness

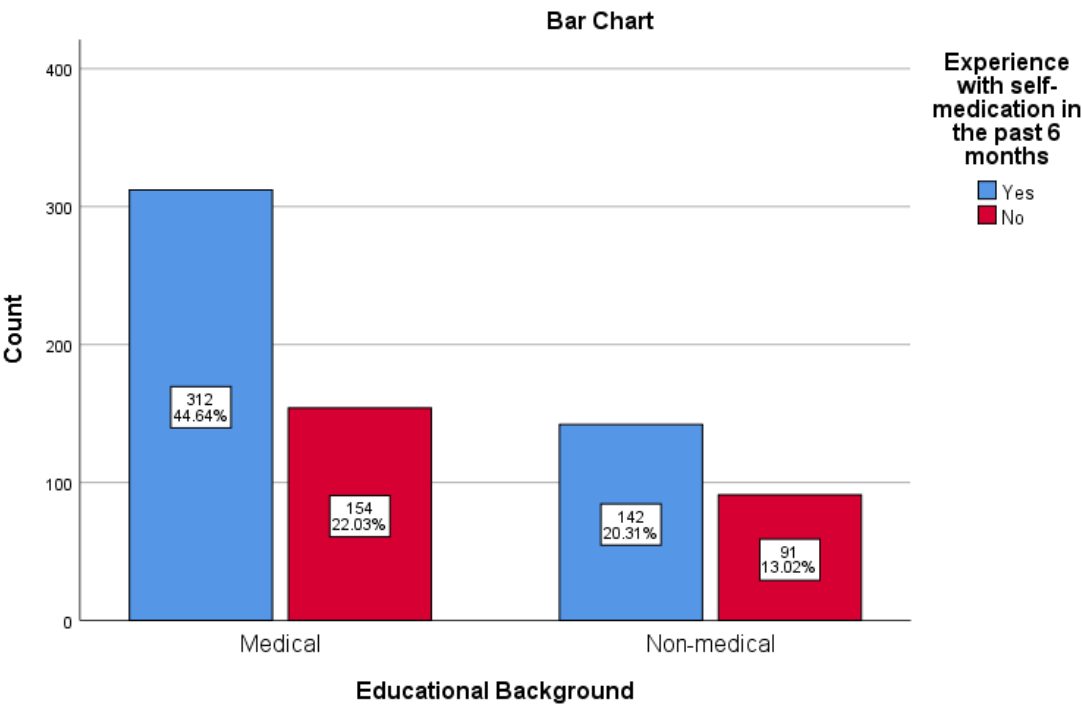
Most students (92.3%) were familiar with the term "self-medication", with significantly higher awareness among medical students ($p < 0.001$). Overall, 82.8% reported awareness of potential risks related to self-medication, again with medical students demonstrating greater awareness (Table 2).

Table 2: Familiarity with Self-Medication and Awareness of Risks by Educational Background

Variable	Medical n (%)	Non-medical n (%)	Total n (%)	p-value
Familiarity with Self-Medication				<0.001
Yes	442 (94.8)	203 (87.1)	645 (92.3)	
No	24 (5.2)	30 (12.9)	54 (7.7)	
Awareness of Risks				<0.001
Yes	410 (88.0)	169 (72.5)	579 (82.8)	
No	56 (12.0)	64 (27.5)	120 (17.2)	

Prevalence and Patterns of Self-Medication

The prevalence of self-medication in the past six months was 64.9% (n=454). There was no statistically significant difference in self-medication practice between medical and non-medical students ($p = 0.117$).



Among those who self-medicated, the most common ailments treated were headaches (58.3%), pain (15.3%), respiratory tract infections (7.3%), and gastrointestinal infections (6.7%). The most commonly used medicines were analgesics (50.8%), followed by antibiotics (25.8%), as shown in Table 3.

Table 3: Illnesses Treated and Types of Medicines Used in Self-Medication (Past 6 Months)

Illness Treated	Frequency (n)	Valid %*
Headache	225	58.3
GI infection	26	6.7
Respiratory tract infection	28	7.3
Pain	59	15.3
Malaria	7	1.8
Skin disease	12	3.1
Eye disease	11	2.8
Psychological	18	4.7
Total (valid responses)	386	100.0
Type of Medicine Used	Frequency (n)	Valid %*
Analgesics (pain relief)	211	50.8
Antibiotics	107	25.8

GIT drugs	20	4.8
Antimalarial	12	2.9
Anthelmintic	6	1.4
Anti-inflammatory	15	3.6
Supplements	44	10.6
Total (valid responses)	415	100.0

*Percentages are out of those who reported self-medicating for an illness or using a medicine.

Sources of Information and Medications

The main sources of self-medicated drugs were pharmacies (81.3%), with fewer students obtaining drugs from family/friends (14.6%) or through online purchases (4.1%). Information sources differed significantly by educational background; medical students were more likely to consult healthcare professionals, while non-medical students relied more on the internet and family ($p < 0.001$).

[Insert Figure 2: Distribution of sources of information and medications for self-medication]

Motivations and Perceptions

The most common reasons for choosing self-medication were the mildness of illness (24.9%), the need for quick relief (22.0%), familiarity with medicines and ailments (18.7%), and the belief in having sufficient knowledge about medications (17.5%). Regarding perceived advantages, students cited quick relief (42.5%) and avoiding doctor visits (38.5%). Main concerns included incorrect dosage (39.8%) and delayed professional diagnosis (32.8%).

Table 4: Motivations, Perceived Advantages, and Concerns Related to Self-Medication (N=699)

Motivation / Perceived Advantage / Concern	Frequency (n)	Percentage (%)
Primary Reason for Self-Medication		
Mildness of the illness	174	24.9
Dissatisfaction with healthcare service	28	4.0
Familiarity with medicines/ailments	131	18.7
Sufficient knowledge about medications	122	17.5
Needed quick relief	154	22.0
To save money	30	4.3
To save time	60	8.6
Perceived Advantages		

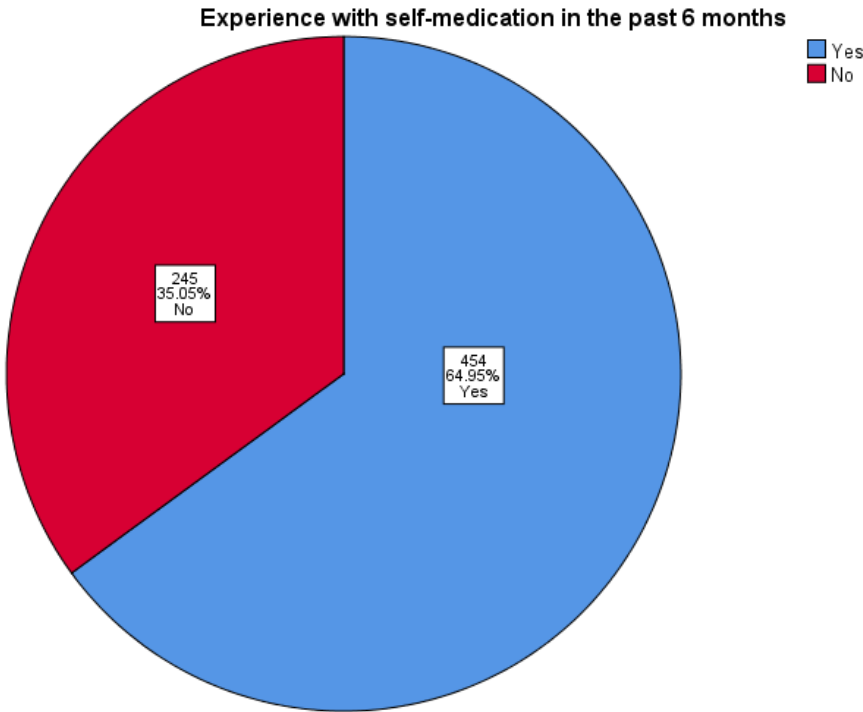
Quick relief	297	42.5
Independence	133	19.0
Avoiding doctor visits	269	38.5
Perceived Concerns/Risks		
Incorrect dosage	278	39.8
Masking underlying conditions	192	27.5
Delayed professional diagnosis	229	32.8

Beliefs and Effectiveness

A slight majority (52.5%) believed that self-medication is safe, with medical students more likely to hold this belief ($p = 0.001$). Most students (89.4%) considered self-medication effective, with no significant differences between medical and non-medical backgrounds.

Experience of Side Effects

Side effects due to self-medication were reported by 27.0% of participants, while 73.0% did not report any side effects. There were no significant differences in reported side effects by gender or educational background.



Statistical Associations

Chi-square analysis demonstrated significant associations between educational background and familiarity with the term self-medication, awareness of risks, perception, belief in safety, sources of information, primary reasons for self-medication, and sources of drugs (all $p < 0.05$; see **Table 5** for summary of significant associations). No significant associations were found between educational background and experience with self-medication in the past six months, experience of side effects, or perceived effectiveness.

Table 5: Summary of Significant Associations between Educational Background and Key Variables

Variable	p-value	Significant Association
Familiarity with self-medication	<0.001	Yes
Awareness of risks	<0.001	Yes
Perception of self-medication	0.001	Yes
Belief in safety of self-medication	0.001	Yes
Sources of information for self-medication	<0.001	Yes
Primary reasons for self-medication	<0.001	Yes
Common sources of self-medicated drugs	0.005	Yes
Experience with self-medication in past 6 months	0.117	No
Experience of side effects	0.470	No
Perceived effectiveness of self-medication	0.258	No

Additionally, year of study showed significant associations with awareness of risks, perception, belief in safety, experience in the past six months, information sources, frequency, and primary reasons for self-medication ($p < 0.05$).

The findings indicate a high prevalence of self-medication among students at Superior University, with both medical and non-medical students engaging in the practice at similar rates. However, medical students exhibited higher levels of awareness and knowledge, and were more likely to consult professionals when making decisions about self-medication. Despite this, a considerable proportion of both groups believed self-medication to be safe and effective, and many participants underestimated the risks associated with improper use of medications. The frequent use of analgesics and antibiotics, as well as the notable percentage of students reporting side effects, highlights

the need for targeted interventions and educational programs to promote responsible medication use.

Discussion

This study reaffirmed the high prevalence of self-medication among university students, aligning with global data indicating rates of approximately 70% (meta-analysis: 70.1%) (7). Although medical students tend to have greater pharmacological knowledge, their involvement in self-medication remains substantial. In a Tanzanian study, 59.2% of non-medical and 49.1% of medical students self-medicated with antibiotics, with medical students being 1.6 times more likely to self-medicate despite better knowledge scores (AOR 1.6, 95% CI 1.2–2.3) (2).

In our study, headaches and pain were the most common conditions self-treated, with analgesics being the most frequently used drug class. This finding mirrors the dominant trends from Brazil, where analgesic use was reported in 65.7% of cases during the COVID-era PADu-multicenter project (8). Similarly, painkillers remain the primary category across various student populations (6).

Drivers for self-medication reported in our cohort such as previous experience, time-saving, and mild illness echo findings from Riyadh, where 81.6% of students self-medicated, and the most common motivations were past experience (66.5%) and convenience (50.2%) (9). In Karachi, 75% of non-medical students relied on online information, and 76.9% self-medicated at least once, underscoring the impact of Internet-based self-diagnosis (3).

The persistent use of antibiotics without prescription remains alarming. Our findings are consistent with regional evidence showing significant antibiotic self-medication rates in LMICs. For example, a meta-analysis highlighted a pooled antibiotic self-medication prevalence of 55.3% in Africa alone (10). The Dar-es-Salaam study also reported that non-medical students had higher antibiotic self-medication rates than medical counterparts (59.2% vs. 49.1%; $p < 0.004$) (2).

Notably, increased familiarity among medical students did not correspond with lower self-medication rates. Such paradoxical findings have been observed elsewhere; increased pharmacological literacy may engender overconfidence and irresponsible medication behaviors (Tanzania study) (2). This suggests that knowledge alone is insufficient to reduce inappropriate self-medication.

The COVID-19 pandemic appears to have exacerbated self-medication trends. The PADu-project in Brazil found that infection suspicion was associated with a 1.63-fold increase in self-medication behaviors, particularly relying on OTC analgesics and

antipyretics (8). Similarly, reliance on home-based remedies and self-prescribed meds rose as students avoided healthcare facilities due to infection fears (3).

In summary, self-medication remains prevalent among both medical and non-medical students at Superior University, with similar risk patterns emerging globally. Interventions that surpass mere knowledge transfer such as enforcing safe dispensing and strengthening health-seeking behaviors are essential.

Implications for policy and practice include integrating pharmacological education across all academic disciplines, enforcing prescription-only access to antibiotics, and enhancing the role of pharmacists in promoting rational use. Behavioral interventions should also target misconceptions about safety and efficacy of self-medication.

Limitations of this study include the cross-sectional design, reliance on self-reported data, and sampling from a single institution, limiting generalizability. Future research could focus on longitudinal and interventional approaches.

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Self-Medication Study - Questionnaire

Consent

I consent to participate in this study. I understand it is voluntary, confidential, and I may withdraw at any time.

☐ Yes, I consent ☐ No, I do not consent

Section 1: Basic Information

- Age: _____
- Gender: ☐ Male ☐ Female ☐ Other
- Educational Background: ☐ Medical ☐ Non-Medical
- Year of Study:
 - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th

Section 2: Knowledge & Perception

1. Do you know what self-medication means? ☐ Yes ☐ No
2. Are you aware of risks of self-medication? ☐ Yes ☐ No
3. How do you perceive self-medication? ☐ Positive ☐ Neutral ☐ Negative
4. Do you believe it is safe? ☐ Yes ☐ No
5. Have you self-medicated in the past 6 months? ☐ Yes ☐ No

Section 3: Practices & Opinions

6. Sources of information? (Select all that apply):
 - ☐ Internet ☐ Family ☐ Friends ☐ Healthcare professionals ☐ Pharmacists
7. Frequency of self-medication:
 - ☐ Never ☐ Rarely ☐ Occasionally ☐ Frequently
8. Reasons for self-medication (Select all):
 - ☐ Mild illness ☐ Poor healthcare access ☐ Familiarity with meds
 - ☐ Sufficient knowledge ☐ Quick relief ☐ Save money ☐ Save time
9. Benefits perceived (Select all):
 - ☐ Quick relief ☐ Independence ☐ Avoid doctor visits
10. Concerns/risks (Select all):
 - ☐ Incorrect dosage ☐ Masking condition ☐ Delayed diagnosis
11. Side effects experienced? ☐ Yes ☐ No
12. Did it help you recover? ☐ Yes ☐ No

Section 4: Medication & Illnesses

13. Illnesses self-medicated for (Select all):
 - ☐ Headache ☐ GI infection ☐ Respiratory infection ☐ Pain ☐ Malaria
 - ☐ Skin disease ☐ Eye disease ☐ Psychological
14. Drug classes used (Select all):
 - ☐ Analgesics ☐ Antibiotics ☐ GIT drugs ☐ Antimalarials ☐ Anthelmintics
 - ☐ Anti-inflammatories ☐ Supplements

15. Medication source:

☐ Pharmacy ☐ Online ☐ Family/Friends