

TO EVALUATE THE LEVEL OF AWARENESS, RISK PERCEPTION, AND INFLUENCING FACTORS OF SELF-MEDICATION AMONG UNIVERSITY STUDENTS: A COMPARATIVE CROSS SECTIONAL STUDY.

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Abstract

Objective(s): To compare the prevalence and frequency of self-medication among medical and non-medical students and to assess the influence of digital media, risk perception, and level of awareness on self-medication.

Methodology: A Comparative cross-sectional study was conducted on students from medical and non-medical universities in Peshawar (Jan-Sep 2024). A total sample of 550 was calculated using OpenEpi (95% confidence, 5% margin of error). Stratified random sampling ensured proportional representation. Data were collected via a structured questionnaire on demographics, drug use patterns, information sources, awareness of side effects, and risk perception. Analysis was performed using SPSS v26 with Chi-square tests ($p < 0.05$).

Results:

Among 550 students (55% medical, 45% non-medical), self-medication was more prevalent in medical students (32%) vs. non-medical (20%) ($p = 0.03$). Commonly used drugs were antipyretics (57%), antiallergics (19%), and antibiotics (6%). Awareness of side effects was low; only 33% were fully aware, with higher awareness observed among medical students (42% vs. 20%).

Antibiotic use without prescription was reported by 25% in both groups with significant association ($p = 0.005$). Antiallergic self-medication was significantly higher among medical students ($p < 0.001$).

Digital influence was notable: 24% used platforms like ChatGPT/Google, 44% self-diagnosed, and 57% were influenced by peers or social media. Barriers to healthcare access (41%) and financial/time constraints (33%) were key reasons for self-medication.

Conclusion:

Self-medication is common among students, particularly medical students, yet overall awareness remains low. Social media plays a significant role in promoting this practice because of its easy accessibility, lower cost, and time-saving appeal.

INTRODUCTION:

Self-medication is commonly practiced as a routine component of self-care to maintain personal health ¹. It is commonly defined as the

use of medicines, including herbs or home remedies, initiated by an individual or based on informal advice, without professional medical consultation ². Self-medication is a component of

self-care and is considered as primary public health resource in health care system.

Some studies have revealed the burden of self-medication is higher in developing countries than in developed countries especially in using of Antibiotics. However, inappropriate antibiotic use is a growing concern. While healthcare professionals may recognize the severity of antibiotic misuse, public awareness remains low. A study in Italy found that only 9.8% of the general population understood what antibiotic resistance means, and just 21.2% knew when antibiotics should be used³. Self-medication is more prevalent 4-75% in Asia as compared to the 3% in northern Europe⁴.

In university students in Karachi self-medication is to be high as 80.4%, among them 83.3% were in medical students as compared to non-medical students which was 77.7%⁵.

The leading factor of Self-medication, due to its lower cost, is a substitute for people who cannot afford proper medical care⁶. They also prefer self-medication due to minor illness and less time consuming. Findings from Yemen and Uzbekistan showed that 49% of respondents discontinued antibiotics on their own as soon as they started feeling better⁷.

Self-medication poses several significant risks, including the misuse of medical resources, the emergence of drug-resistant pathogens, and serious health consequences such as adverse drug reactions and extended illness duration. Antimicrobial resistance remains a growing global concern, especially in developing nations where antibiotics are often accessible without a prescription.^{1,8}

Self-medication is a rising public health concern, particularly among university students. While medical students may self-medicate due to perceived knowledge, non-medical students often rely on digital platforms and peer advice, sometimes lacking awareness of associated risks. In Pakistan, the easy availability of medicines and minimal regulation further fuel this trend. Despite the increasing digital influence on health behaviors, comparative data on self-medication practices between medical and non-medical

students in Peshawar is scarce. This purpose of this study is to explore the differences in self-medication behavior, risk perception, and digital influence to inform targeted public health strategies.

Given the rising trend of self-medication among young adults, especially university students, there is a critical need to understand the underlying factors driving this behavior. Despite widespread access to information and varying levels of health literacy, comparative data between medical and non-medical students in Pakistan remains scarce. Therefore, this study aims to compare the frequency and types of self-medicated drugs among medical and non-medical university students in Peshawar, assess their awareness regarding the risks and side effects of self-medication, evaluate the influence of digital media, peer advice, and prior experience, and identify differences in risk perception and decision-making confidence between the two groups

Methodology

Study Design and sample Size:

This study employed a comparative cross-sectional design to compare self-medication practices among medical and non-medical students in Peshawar. A total sample of 550 participants was included, comprising equal number of medical students and non-medical students across different universities in Peshawar, KPK.

The sample size was calculated using OpenEpi, with a 95% confidence interval and a 5% margin of error. Stratified random sampling was used to ensure proportional representation from various colleges.

Inclusions and exclusions:

The study included medical students enrolled in 1st to 3rd year MBBS programs, as well as non-medical undergraduate students from various disciplines. Only those students who had self-reported engaging in self-medication within the past six months and had provided informed consent were eligible to participate. Exclusion criteria consisted of final-year medical students and interns, due to their higher clinical exposure,

as well as students who were enrolled in pharmacy or paramedical programs to minimize potential bias arising from advanced drug knowledge. In addition, participants with chronic medical conditions requiring regular medication were excluded to avoid confounding, and any incomplete or invalid questionnaire responses were also excluded from the analysis.

Ethical Consideration:

Ethical approval was taken from the Ethical Review Committee of the Prime Foundation Under the Reference No: Prime/ERC/2023-05 on 5th October 2022. Participants privacy and confidentiality was assured.

Data analysis:

Data were collected through a structured questionnaire developed for this study, which

comprised sections on demographic information, frequency and types of self-medicated drugs, sources of drug information, awareness of side effects, and a validated risk perception scale.

Data were analyzed using descriptive statistics, including frequency distributions, means, and standard deviations. The Chi-square test was employed to compare categorical variables between groups. All analyses were conducted at a significance level of $p < 0.05$.

Results

Out of the total 550 participants, 55% ($n = 270$) were medical students, while 45% ($n = 240$) were non-medical students enrolled in disciplines such as engineering, arts, and business. The majority of respondents were male (60%), and the mean age was 22 years. Regarding academic standing, 50% were third-year students, 30% were in their first year, and 20% were in their second year. table 1

Table 1 : Socio-demographics distribution of the Students .

Characteristic	Category	Frequency (n)	Percentage (%)
Student Type	Medical	270	55%
	Non-Medical (Engineering, Arts, Business)	230	45%
Gender	Male	300	60%
	Female	200	40%
Mean Age			22 years
Academic Year	First Year	150	30%
	Second Year	100	20%
	Third Year	250	50%

Regarding self-medication practices, the most commonly used drugs were antipyretics and analgesics (57%), followed by antiallergic medications (19%), gastric medications (13%), and antibiotics (6%). When experiencing symptoms such as fever or headache, 30% of participants opted for self-medication, with medical students (32%) more likely than non-medical students (20%) to self-medicate. Conversely, 28% consulted a physician, with higher proportions among medical (37%) than non-medical (30%) students with statistically

significant association ($p = 0.03$).

Awareness of the risks and side effects associated with self-medication was generally low. Only 33% of participants—42% of medical students and 20% of non-medical students—were fully aware of the potential side effects, while 23% reported minimal knowledge. Approximately 46% were aware of drug toxicities. Half of the respondents reported using antibiotics only upon a doctor's recommendation, with significantly more medical students (60%) than non-medical students (40%) doing so. Nonetheless, 25% in both groups

admitted to self-medicating with antibiotics, with this difference reaching statistical significance ($p = 0.005$). Only 34% of participants had heard of antibiotic resistance.

For gastric issues, 41% of students among them 51% of medical and 40% of non-medical used medication as per a physician's advice, while 25% in each group reported self-medicating and statistically nonsignificant ($p = 0.10$) association was found. Antiallergic drugs were among the most frequently self-medicated, with 55% using them without a prescription. Among these, 25% were medical students and 12% were non-medical students. In contrast, only 20% of respondents used antiallergics under medical guidance, with 64% being medical students and 48% non-medical students ($p < 0.001$). Regarding side-effect awareness for antiallergics, 23% were unaware, and only 17% had adequate knowledge.

Cold and cough medications were also frequently self-administered; 41% of students (45% medical, 38% non-medical) preferred self-medication, while 29% (32% medical, 24% non-medical) consulted a doctor. This difference was not statistically significant ($p = 0.36$). Moreover, 23% of participants had no knowledge of the potential side effects of these medications, and 20% had only partial awareness.

Following the use of medication, 40% of students reported discontinuing treatment based on self decision, whereas 36% withdrew medication according to doctor advice. When asked about drug safety perception, 57% of respondents considered antipyretics to be safe for self-medication, followed by 22% who preferred antitussives safe, and 20% who believed gastric medications could be safely self-administered.

Table 2: Shows Self medication among university students for specific Health issues.

Variable	Medical Students (%)	Non-Medical Students (%)	Total (%)	p-value
1)Self-medication for fever/headache	32%	20%	30%	0.03
Consulted physician for fever/headache	37%	30%	28%	0.03
Full awareness of side effects	42%	20%	33%	—
Minimal awareness of side effects	—	—	23%	—
Awareness of drug toxicities	—	—	46%	—
2)Used antibiotics on doctor's advice	60%	40%	50%	—
Self-medicated with antibiotics	25%	25%	25%	0.005
Heard of antibiotic resistance	—	—	34%	—
Used gastric medications on doctor's advice	51%	40%	41%	0.10
Self-medicated for gastric issues	25%	25%	25%	0.10
Self-medicated with antiallergics	25%	12%	55%	<0.001
3)Used antiallergics on doctor's advice	64% (of 20%)	48% (of 20%)	20%	—
Unaware of antiallergic side effects	—	—	23%	—
Aware of antiallergic side effects	—	—	17%	—

Variable	Medical Students (%)	Non-Medical Students (%)	Total (%)	p-value
Self-medicated with cold/cough medications	45%	38%	41%	0.36
4)Used cold/cough medications as prescribed	32%	24%	29%	0.36
No awareness of cold/cough side effects	—	—	23%	—
Partial awareness of cold/cough side effects	—	—	20%	—

In terms of information sources, only a minority relied on healthcare professionals. A significant proportion of students (24%) reported using digital platforms such as ChatGPT, Google, and other online sources for guidance. Additionally, 57% were influenced by social media personalities, peers, or online influencers.

Remarkably, 44% of students used platforms like Google, YouTube, and ChatGPT to self-diagnose their symptoms. Alarming, 44% of participants admitted to prescribing or recommending medications to others without medical qualifications.

Table 3: Source of Self medication among University students.

Source of self-medication	Frequency (n)	Percentage (%)
Used digital platforms (ChatGPT, Google, etc.)	120	24%
Influenced by social media/peers/influencers	285	57%
Self-diagnosed using YouTube, Google, ChatGPT	220	44%
Recommended/prescribed medications to others	220	44%

When asked about reasons for self-medication, 41% cited long-distance travel barriers to accessing healthcare facilities. Financial constraints and time limitations were reported by 17% of students.

Another 16% preferred self-medication due to prolonged waiting times and delays commonly experienced in government health care facilities.

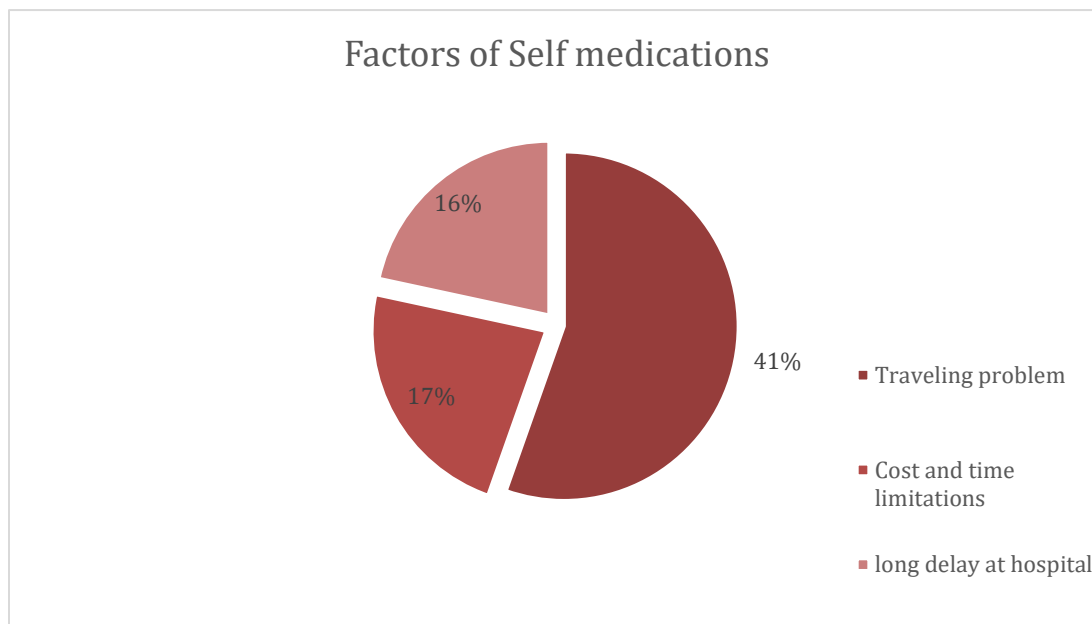


Figure 1: Shows Reasons of Self medication

Discussion

The findings of this study reveal a high prevalence of self-medication practices among both medical and non-medical university students in Peshawar, with notable differences in drug choice, awareness levels, and influencing factors. This is consistent with previous studies conducted in South Asia and globally, which have reported widespread self-medication behaviors among university populations due to easy access to over-the-counter drugs, time constraints, and perceived mildness of symptoms [1, 5]. In our study (57%), aligning with studies from India and Nepal that found similar trends among students treating common conditions like fever and headache without medical consultation [1, 10, 13]. Antiallergic and gastric medications were also commonly used, reflecting findings from studies in North India and West Bengal [6, 14]. Notably, awareness of the risks associated with self-medication was alarmingly low. Only 33% of participants demonstrated full awareness of side effects, with a significant gap between medical (42%) and non-medical (20%) students. This mirrors results from

research in Karachi and West Bengal, which emphasize the knowledge gap among students

despite widespread practice [5, 11].

The misuse of antibiotics is of particular concern. Although 50% reported using antibiotics only on a doctor's recommendation, 25% admitted to self-medicating with antibiotics a finding statistically significant between groups ($p = 0.005$). This echoes studies in Nepal and Saudi Arabia, where self-medication with antibiotics was linked to a lack of awareness about antimicrobial resistance [7, 10, 12]. Only 34% of our respondents had heard of antibiotic resistance, similar to the low awareness reported by Shrestha et al. and Shah et al. in Nepal [10, 13].

Digital platforms like ChatGPT, Google, and YouTube were used by 24% for drug guidance, while 44% admitted to self-diagnosing through online sources. This trend reflects a growing dependency on non-medical digital information, as reported by Banerjee et al. and Vizhi et al., raising concerns about unregulated online health content [1, 11]. Alarmingly, 44% of students had also recommended medications to others without

qualifications, indicating a potentially dangerous ripple effect within peer networks.

Social and infrastructural challenges were also identified. Factors such as long-distance travel, financial constraints, and delays in public hospitals were cited as primary reasons for choosing self-medication. These barriers are consistent with those reported in Mexico, South India, and Nepal, where systemic inefficiencies push individuals toward self-care without professional oversight [4, 8, 13].

Medical students, while more aware of drug risks, still showed substantial self-medication behavior, possibly due to overconfidence in their partial knowledge a pattern noted in studies from Pakistan, Italy, and Yemen [3, 7, 9]. Although their curriculum provides basic pharmacological knowledge, it may not be sufficient to prevent inappropriate practices, especially under peer influence or time pressure

What makes this study especially valuable is its focus on a new generation of self-medicators, those influenced not just by peer experience, but also by rapidly growing access to online medical content. These results point to an urgent need for health education programs, especially in universities, that promote safe practices and digital health literacy. Moving forward, this research can serve as a foundation for developing policy guidelines, awareness campaigns, and future studies focused on managing the influence of digital platforms in healthcare decisions ensuring students are informed, cautious, and supported in making the right choices for their health

Our findings highlight a growing reliance on digital tools and peer networks by university students for health-related decisions, often in place of professional consultation and social networks when it comes to managing their health. Unlike previous studies, this research highlights the emerging role of platforms like ChatGPT, Google, and YouTube in shaping students' choices about medication and diagnosis. This is particularly relevant in a time when access to professional healthcare can be limited by distance, time, or cost. One of the most striking findings is that nearly half of the students had not only self-

medicated but also recommended medications to others without medical training, which raises serious concerns about the potential misuse of drugs and rising antibiotic resistance.

Limitation:

Despite all positive findings there is certain limitations. The study didn't explore self medication of particular drugs. Therefore, difference in pattern and risk associated with particular drugs couldn't be assessed. Major side effects were recorded based on students own knowledge which may not represent actual pharmacological risk. Moreover the findings are based on Specific Population like students from both medical and non medical background which may not be generalizable to other age groups or general public.

Conclusion

Self-medication is highly prevalent among both medical and non-medical students, with medical students demonstrating slightly higher consumptions but better awareness. However, overall knowledge of risks and side effects remains inadequate in both. Digital platforms and social media significantly influence self-medication practices. Targeted educational interventions and stricter regulation from government are needed to promote safe medication practices among students and general public.

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Conflict of interest:

The authors declare no conflict of interest.

Authors Contribution

MAK: Proposed the idea, Designed the study, Principal investigator, interpretation of data, Reviewed the manuscript, Accuracy and integrity of work and Final Approval.

R: Literature search, Data collection and compilation, Manuscript writing, statistical

analysis

SS: Data collection, Data analysis and interpretation, Literature search, Drafting, Critical revision

AK and SI: Data collection, Literature search, Data interpretation, Drafting, Critical revision of article

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