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The Prevalence of Self-Medication with Antibiotics among the Students of Spinghar University – Kabul, Afghanistan

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ABSTRACT

Background: Self-medication with antibiotics is a major public health concern that contributes to antimicrobial resistance and treatment failure. This study aimed to assess the prevalence of antibiotic self-medication among university students.

Methods: This descriptive cross-sectional study was conducted among students at Spinghar University, Kabul, Afghanistan, in 2025. Data on antibiotic use, reasons for self-medication, information sources, and demographic characteristics were collected using a structured questionnaire.

Results: Among 306 participants, 228 (74.5%) reported using antibiotics without a physician's prescription. Most were aged 18–22 years (75.8%), had average economic status (69.2%), and lived in dormitories (54.9%). The main reasons for self-medication were confidence in personal treatment decisions (84.3%), easy access to antibiotics (63.4%), and previous experience with their effectiveness (62.7%). The Internet (52.9%) and books and scientific articles (44.4%) were common information sources. Antibiotics were most frequently used for sore throat (78.4%), common cold (61.4%), cough (61.1%), and fever (59.8%). The most commonly reported antibiotics were azithromycin (74.5%), amoxicillin (67.3%), ceftriaxone (49.0%), and ciprofloxacin (48.7%). Most participants (77.4%) used antibiotics only until their symptoms improved.

Conclusion: Antibiotic self-medication was prevalent among Spinghar University students, affecting nearly three-quarters of participants. Personal confidence, easy access, and previous experience were the leading reasons. Educational interventions and improved antibiotic-use practices are needed to promote responsible use and reduce antimicrobial resistance.

Keywords: Antibiotics; Self-medication; Students; Resistance; Afghanistan

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Introduction

Self-medication is defined as the practice in which individuals use medicines to treat illnesses or reduce symptoms without consulting a doctor [1]. Although the concept encompasses the management and treatment of family members, particularly vulnerable populations such as children and older adults, within the healthcare system, self-medication is widely recognized as an important aspect of public health. In this context, it can be considered an integral part of self-care practices, reflecting individuals' ability to manage minor health conditions independently [2].

Antibiotics are medications that destroy bacteria and are used either to prevent the spread of bacterial diseases or to treat infections caused by bacteria [3]. Antibiotics are essential medicines. In some countries, obtaining antibiotics requires a prescription; however, in several low- and middle-income countries, these medications are available over-the-counter (OTC) without a physician's prescription, which may contribute to their inappropriate use. In 1977, the WHO included antibiotics in the list of essential medicines [4]. Since that time, antibiotics have played a significant role worldwide in reducing the burden of infectious diseases and improving public health outcomes [5, 6].

In countries with weak healthcare systems, these medicines are especially critical, as many infectious diseases there can lead to fatal outcomes [7]. In these countries, the inappropriate use of antibiotics is widespread. This problem is mainly associated with self-medication and the purchase of antibiotics without a prescription, particularly by parents. Such practices pose significant challenges to public health, increase economic burdens, and may negatively affect treatment outcomes [8, 9].

A brief overview of the situation globally and in Afghanistan It is important to note that the contribution of antibiotics to self-medication is considerably higher in developing countries than in developed countries. Recent data indicate that the prevalence of self-medication with non-prescription medicines and antibiotics in the community increased from 36.2% in 2019 to 60.4% in 2020 [10].

The prevalence of self-medication with antibiotics is considerably higher in low-income countries than in developed countries. For instance, the prevalence in Northern Europe is approximately 3%, while in some Asian countries, it ranges from 4% to as high as 75% [11] . In addition, a study conducted among first- and fifth-year medical students at Kabul Medical University reported that 25.16% of the students had practiced self-medication [12].

In Karachi, Pakistan, the overall frequency of self-medication among university students was as high as 80.4%. The frequency among non-medical students was 83.3%, while among medical students, it was 77.7% [13].

The WHO has stated that self-medication, when practiced appropriately and responsibly, could help prevent and treat diseases economically without the need for medical consultation [14]. Medications administered inappropriately not only leads to wastage of resources but also carries potential serious and life-threatening adverse effects for the users [15, 16].

Self-medication (with any drug) is higher among the literate, the young and people in low- and middle-income countries [17]. 82.5% of the students were aware of some form of harm caused by self-medication [18].

The inappropriate use of antibiotics is a serious concern in several respects. Although the medical community may be aware of the severity of this growing problem, this awareness is not reflected among the non-medical population, which remains relatively unaware of the issue. In Europe, only 9.8% of the general public knew the definition of antibiotic resistance, while only 21.2% knew when it was appropriate to use antibiotics [19].

Although self-medication with antibiotics has been widely studied in many countries, evidence from Afghanistan remains limited, particularly among university students. To date, no published study has investigated this practice among students of Spinghar University. This lack of local evidence limits the development of targeted interventions to promote the rational use of antibiotics and combat antimicrobial resistance. Therefore, we aimed to determine the prevalence of self-medication with antibiotics among students of Spinghar University and identify the factors associated with this practice.

Methods

Study design

This descriptive, cross-sectional study was conducted to assess the prevalence of self-medication with antibiotics among students of Spinghar University in 2025. Spinghar University is a private higher education institution located in Kabul City.

Sample size

The total study population consisted of all students enrolled at Spinghar University during the study period. Accordingly, 1500 students were enrolled. Participants were selected from the faculties of General Medicine, Medical Laboratory Sciences, and Stomatology.

Sampling method

The sample size was determined using Cochran's formula with a finite population correction, assuming a 95% confidence level (Z = 1.96), and a 5% margin of error (d = 0.05. Based on a study population of approximately 1,500 students, the required sample size was at 306 participants. The distribution of participants was as follows: 202 students from the Faculty of Medicine, 61 students from the Faculty of Stomatology, and 43 students from the Faculty of Medical Technology. A multi-stage stratified sampling method was employed. In the first stage, students were stratified based on their faculties (General Medicine, Medical Technology, and Stomatology). In the second stage, specific classes were randomly selected from each faculty: 9 out of 17 classes from General Medicine, 3 out of 9 classes from Stomatology, 2 out of 7 classes from Medical Technology, and eligible students were randomly selected from the selected classes.

Data source and Measurement

Based on a previous similar study [20], we designed a questionnaire consisting of 12 questions divided into 5 sections to achieve the research objectives. The content validity of the tool was assessed by a group of public health experts, and their feedback was incorporated into the final version. The first section included 7 demographic questions, the second section included 3 questions about information sources and awareness, the third section included 6 questions about the reasons for using antibiotics without a doctor's prescription, the fourth section included 8 questions related to situations in which antibiotics were used, and the fifth section included 7 questions about the type of antibiotic used. The questionnaire was translated into Pashto to ensure clarity and ease of understanding for the participants. The questionnaires were distributed among students in specified classes and were collected again after completion.

Statistical analysis

Data were entered and analyzed using SPSS version 27 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequency, and percentage, were used to summarize the data. In order to describe categorical variables and the demographics of the participants, descriptive methods like frequency and percentage were used. To examine differences in the prevalence of self-medication with antibiotics based on participants' characteristics, we applied cross-

tabulation and $\chi 2$ tests to investigate relationships and associations between categorical variables. A *P*-value of < .05 was considered statistically significant.

Ethical Considerations

This study was conducted in accordance with internationally accepted ethical standards for research involving human participants, including the principles of the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of Spinghar University (AF.SUKIRB.ECR. 2025.003; Date of Approval: 15 August 2025) Informed written consent was obtained from all participants after providing a clear explanation of the study objectives, procedures, potential benefits, and participants' rights. Participation in the study was voluntary, and participants were informed of their right to withdraw from the study at any stage without any penalty or academic consequences.

Results

Out of 306 participants, 228 students (74.5%) at Spinghar University reported using antibiotics without a prescription, whereas 78 (25.5%) did not engage in self-medication with antibiotics. The participants were predominantly young undergraduate students, mainly from the Faculty of Medicine and the second academic year. Most reported a middle economic status, were unmarried, and had no chronic disease. Furthermore, the majority discontinued antibiotic use when they felt better rather than completing the prescribed course, highlighting a potential concern regarding adherence to antibiotic treatment. The sociodemographic characteristics and antibiotic-use patterns of the participants are presented in Table 1.

Table 1: Information of Number of Age group, Faculty, Academic year, Economic status, Residence, Chronic disease and Pattern.

Variable		*Frequency*	*Percentage*	X^2	*P -value*
Age group	18–22 year	232	75.8	281.6	0.0001
	23–27 year	71	23.2		
	28–33 year	3	1.0		
Faculty	Faculty of Medicine	202	66	133.2	0.0001
	Faculty of Stomatology	61	19.9		
	Faculty of Medical Technology	43	14.1		
Academic year	1st year	73	23.9	104.3	0.0001
	2nd year	151	49.3		
	3rd year	64	20.9		
	4th year	18	5.9		
Economic status	Low	56	18.3	152.6	0.0001
	Middle	212	69.3		
	High	38	12.4		
Residence	Dormitory	168	54.9	2.94	0.086
	Home	138	45.1		
. Marital Status	Single	254	83.0	133.4	0.0001
	Married	52	17.0		
Chronic disease	Yes	13	4.2	412.8	0.0001
	No	274	89.5		
	Not sure	19	6.2		
Pattern	Stop when feeling better	237	77.5	92.2	0.0001
	Complete full course	69	22.5		

Sociodemographic characteristics of participant (N=306)

The internet was the most frequently reported source of information, followed by books and scientific articles, as well as friends and family, as presented in Table 2.

Table 2: Sources of information

Variable	*Category*	*Frequency (n)*	*Percentage %*
Source	Internet	162	52.9
	Books & scientific articles	136	44.4
	Friends & family	128	41.8

Participants were allowed to select more than one reason; therefore, percentages do not sum to 100%

Self-confidence in personal judgment was the most frequently reported reason for self-medication with antibiotics, followed by easy access without a prescription and previous experience with perceived effectiveness. Financial constraints and lack of time were also reported, while lack of access to a doctor was the least common reason, as shown in Table 3.

Table 3: Reasons for self-medication

Variable	*Category*	*Frequency (n)*	*Percentage %*
Reasons for Self-Medication with Antibiotics	Lack of time to visit a doctor	113	36.9
	Cannot afford doctor's fee	118	38.6
	Easy access to antibiotics without a prescription	194	63.4
	No access to a doctor	69	22.5
	Self-confidence (belief in own judgment)	258	84.3
	Previous experience and perceived effectiveness	192	62.7

Participants were allowed to select more than one reason; therefore, percentages do not sum to 100%.

Ear pain was the most frequently reported condition associated with antibiotic use, followed by diarrhea and toothache, whereas sore throat was the least common, as shown in Table 4.

Table 4: Condition (Reason for Antibiotic Use)

Variable	*Category*	*Frequency (n)*	*Percentage %*
Condition (Reason for Antibiotic Use)	Fever	123	40.2
	Ear pain	213	69.6
	Diarrhea	155	50.7
	Common cold	118	38.6
	Toothache	178	58.2
	Sore throat	66	21.6
	Cough	119	38.9
	Headache	172	56.2

Participants were allowed to select more than one reason; therefore, percentages do not sum to 100%

Azithromycin was the most frequently reported antibiotic, followed by Amoxicillin, whereas Streptomycin was the least frequently reported, as shown in Table 5.

Table 5: Antibiotics used for self-medication

Antibiotic Category	***Yes (N %)***	***No (N %)***
Amoxicillin	206 (67.3)	100(32.7)
Penicillin	97(31.7)	209(68.3)
Azithromycin	228(74.5)	78(25.5)
Metronidazole	143(46.9)	162(53.1)
Ceftriaxone	150(46.9)	156(51.0)
Ciprofloxacin	149(49)	157(51.3)
Streptomycin	60(19.6)	246(80.4)

Discussion

This study evaluated the prevalence of self-medication with antibiotics among students. Our findings showed that 74.5% of participants used antibiotics without a doctor's prescription, indicating a high prevalence of self-medication. Previous studies have reported varying prevalence rates of antibiotic self-medication across different countries and populations. A study conducted in Kabul, Afghanistan, in 2022 reported a prevalence of 38% [12], while higher rates were observed among university students in other regions, including 47.8% in Southern China [21], 79.5% in Sudan [22], and 90.2% of university students reported self-medicating with antibiotics in Iran [23]. In Nigeria, a prevalence of 93.9% was reported [24]. The prevalence observed in the present study was lower than that reported in Sudan, Iran, and Nigeria but higher than the rates reported in Afghanistan and Southern China. Nevertheless, the high prevalence observed in our study remains a public health concern .These variations may be attributed to differences in healthcare systems, accessibility of antibiotics, regulatory policies regarding antibiotic sales, levels of health awareness, and cultural factors influencing medication practices.

In terms of age, the highest antibiotic consumers in this study were those aged 18–22 years. In Iraq, the highest antibiotic consumers were aged 18–39 years [25]. In Yemen, the highest antibiotic consumers were also aged 18–39 years [26]. In terms of academic year, the highest antibiotic consumers were second-year students, whereas in a study conducted in Pakistan, the first-year students were the highest consumers [27]. In terms of economic status, most participants had a middle economic status, which was consistent with the findings of a similar study conducted in Yemen. Regarding marital status, most participants in the present study were unmarried, whereas the study conducted in Yemen reported a higher proportion of married participants. [26].

The main reasons for self-medication in this study included self-confidence, easy access to medications, and previous experience and effectiveness of medications. Similarly, a study conducted among civil servants in Uyo, Southern Nigeria, reported that the most common reason for self-medication was the perception that the illness was mild and did not require medical consultation [24]. while in Afghanistan, previous experience with medications, effectiveness, and the absence of doctor costs were the main factors [20]. Regarding the use of antibiotics in this study, amoxicillin,

azithromycin, ceftriaxone, and ciprofloxacin were used frequently. In a similar study conducted in Afghanistan, amoxicillin, azithromycin, and penicillin were the most used, in Nigeria ampicillin and metronidazole, and in Pakistan, metronidazole and amoxicillin were the most frequently used antibiotics [20, 24, 27].

In the present study, ear pain, toothache, headache, and diarrhea were the most frequently reported conditions associated with antibiotic use, whereas sore throat was the least frequently reported. In contrast, a study conducted in Pakistan identified fever and pain as the leading conditions associated with antibiotic self-medication [27]. These differences may reflect variations in the patterns of antibiotic use between the two study populations. The duration of antibiotic use in this study was determined until the symptoms of participants improved, whereas a study conducted in Iran shows that the duration of use was until the complete course of the drug was finished [28]. Information sources about antibiotics were mainly obtained via the internet and through books or scientific articles, while the study conducted in Afghanistan shows that important information sources included advice from friends and family, and information was obtained through the internet [20].

These findings can be used as a basis for preventing self-medication with antibiotics. Ideally, it is the government's responsibility to ensure that every population uses self-medication responsibly. Medications that are available without the need for a doctor's prescription or trained medical personnel should only be those that are safe for consumption. The government should also ensure that users are fully educated, not only about the use of the medication but also about the correct doses and duration of use. Doses, duration of use, and potential side effects associated with antibiotics are adjusted not only based on the disease but also according to the individual profile of the patient. There are some limitations in our study. Only male students were included in this study; therefore, the findings may not be generalizable to female students or the entire university student population.

Conclusion

Self-medication with antibiotics is highly prevalent among students of Spinghar University, with 74.5% of participants reporting the use of antibiotics without a prescription. Inappropriate antibiotic-use practices, particularly discontinuation of treatment after partial recovery (77.5%), are common and may contribute to the emergence of antimicrobial resistance. Self-confidence in personal decision-making, easy access to antibiotics, and previous experience were identified as major factors influencing self-medication behavior. Antibiotics were mainly used for symptoms such as sore throat, common cold, cough, and fever, with Azithromycin and Amoxicillin being the most frequently consumed drugs. These findings highlight the urgent need for strengthening antibiotic stewardship programs, improving students' awareness regarding rational antibiotic use, and promoting consultation with healthcare professionals before antibiotic consumption. Implementing targeted educational interventions and stricter control of non-prescription antibiotic access is essential to reduce inappropriate antibiotic use and prevent the growing threat of antimicrobial resistance among university students .

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Conflicts of interest

The authors declare no conflicts of interest, financial or otherwise, that could have influenced the work reported in this study.

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