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Original Article

Assessing the Impact of Self-Medication with Antibiotics Among Medical Students

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ABSTRACT

Self-medication is different from self-care in that it uses drugs, which might be helpful or detrimental. According to a number of studies, improper self-medication carries significant health concerns like unpleasant side effects, prolonged pain, and drug dependence. **Objective:** To explore the adverse effects of self-medication with antibiotics among medical students. **Methods:** Over the course of seven months, from November 2022 to May 2023, a multi-institutional cross-sectional study was conducted at the University Medical and Dental College of the University of Faisalabad and Bahria University Health Sciences, Karachi (BUHS). The ethical approval was obtained from the Ethical Review Committee of BUHS (Ref: ERC/05/2023) and Institutional Review Board of The University of Faisalabad (Ref: TUF/IRB/153/2022). A sample size was calculated by OpenEpi website calculator. Microsoft excel was used to store the data and IBM SPSS version 23.0 was used for data analysis. A self-designed performa was used to collect data. **Results:** There was a total of 1340 students in our survey, and an equal number of students 670 (50%) were recruited from each institute. 414 (61.8%) students from BUHS and 494 (73.7%) from UMDC were found to have self-medication practices. 39.9% and 38.2% of the students from 1st year and 2nd year of medical education were found to self-medicate. 69.5% of the hostelite students were found to self-medicate antibiotics. **Conclusions:** Our research can be concluded as self-medication of antibiotics is a common practice among future health care professionals, with the highest incidence seen in the 1st and 2nd year of medical education. Several adverse symptoms arising due to this practice were seen with the highest being tiredness and dizziness.

INTRODUCTION

Obtaining and using pharmaceuticals without first visiting a doctor for a diagnosis, prescription, or therapeutic supervision is known as self-medication [1]. Self-medication is different from self-care in that it uses drugs, which might be helpful or detrimental. According to a number of studies, improper self-medication wastes resources, leads to the development of pathogen resistance, and frequently carries significant health concerns like unpleasant side effects, prolonged pain, and drug dependence. Medical students are more likely to self-medicate for a variety of reasons[2]. These students have easy access to information from literature, medication indexes, and other medical students to self-diagnose and self-medicate [3]. Additionally, because pharmaceutical reps offered physician samples, they had simple access to the drug itself, and "The White Coat" provides trouble-free access to medications accessible in pharmacies [4]. Antibiotics are medications that inhibit the development of bacteria and are used to treat and prevent bacterial infections [5]. These medications are essential in

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developing nations where infectious diseases remain a major cause of morbidity and death [6]. In third-world nations, self-medication, and parent-to-child prescriptions, mostly for over-the-counter antibiotics, have put the social, economic, and therapeutic advantages of antibiotics at risk [7]. The media and the internet have a large influence on young people and encourage self-medication. Because of growing pharmaceutical commercialization, the younger generation, as a whole, is more sensitive to self-medication. This raises the likelihood of incorrect self-diagnosis, prescription interactions, and drug use in excess of the indicated dosage [8]. According to a Nigerian survey, a group of health professionals, including dental, midwifery, and nursing students, self-medicate frequently, particularly by swallowing antibiotics. Several studies claim that practicing physicians self-prescribe antibiotics on a frequent basis [9]. The decision to focus on student healthcare workers stems from their dual status as both possible future antibiotic prescribers and beneficiaries of formal medical instruction. As these individuals progress from medical students to healthcare practitioners, their self-medication habits and attitudes can have a significant impact on their future medical practices and the greater healthcare environment [10]. As a result, studying their antibiotic self-medication behaviors provides a unique chance to investigate the relationship between education, professional identity, and personal use of pharmaceuticals, particularly antibiotics. Antibiotics used for self-medication have numerous risks, including severe or even fatal allergic responses. If the dosage is too low, the symptoms may not go away [11]. A high dosage could cause collateral organ damage, making it difficult for a clinician to determine the right diagnosis and course of treatment. Self-medication with antibiotics may have detrimental consequences, such as insufficient and inappropriate illness therapy, wrong drug dosages, and incorrect drug combinations [12].

The findings of this study can inform the development of policies and interventions aimed at reducing self-medication rates among medical students. It can guide the implementation of support mechanisms, such as counseling services, stress management programs, and educational initiatives, to address the underlying factors contributing to self-medication during the identified critical year.

METHODS

Over a seven-month period (November 2022 to May 2023), a cross-sectional study involving two institutions was undertaken at the University Medical and Dental College, University of Faisalabad, and Bahria University Health Sciences in Karachi. The University of Faisalabad's Institutional Review Board (Ref: TUF/IRB/153/2022) and BUHS's Ethical Review Committee (Ref: ERC/05/2023) both approved the study's ethical criteria. After determining the sample size with a reference research and the OpenEpi calculator (https://www.openepi.com/SampleSize/SSCohort.htm), the sample was expanded to 1340 for better observations. Non-probability convenience sampling was used to choose students. Medical, Dental, Nursing, and DPT undergraduate students from Bahria University Health Sciences and University Medical and Dental College Faisalabad, Faisalabad University, were selected for the study using inclusion and exclusion criteria. The students were given a briefing, outlining the viewpoints of the study. Students with general good health, no history of drug misuse, and no frequent use of drugs or supplements were required for inclusion. Excluded from the research were students who had a known illness or who refused to take part in it. Informed consent was acquired. As a means of gathering data, a structured questionnaire was created in accordance with earlier and disseminated via Google forms. The Performa's first section includes a questionnaire asking participants about their demographics; other sections of the questionnaire assessed the students' prevalence of self-medication. The data were stored in Microsoft Excel, and IBM SPSS version 23.0 was utilized for data analysis. The study samples' baseline characteristics, such as gender, university, enrollment program, native, hostelite, or day scholar, academic year of the participants, and practice of self-medication with antibiotics, were counted and percentages were reported. Using the Pearson Chi Square test, the relationship between antibiotic self-medication practice and p-value was examined. A p-value of less than 0.05 was deemed significant. The data was graphically presented using charts.

RESULTS

There was a total of 1340 students in our survey, and an equal number of students, 670 (50%), was recruited from each institute. 414 (61.8%) students from BUHS and 494 (73.7%) from UMDC were found to have self-medication practices. 39.9% and 38.2% of the students from 1st year and 2nd year of medical education were found to self-medicate. 69.5% of the hostelite students were found to self-medicate antibiotics.

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Table 1: Demographic variables of study subjects and association with antibiotics self-medication.

Variables		Antibiotics Self-Medication N (%)		p-value
		Yes	No	
University	BUHS	414 (61.8)	256 (38.2)	0.00
	UMDC	494 (73.7)	176 (26.3)	
Gender	Male	261 (63.3)	151 (36.7)	0.02
	Female	647 (69.7)	281 (30.3)	
Academic Year	1	262 (60.1)	174 (39.9)	0.02
	2	110 (61.8)	68 (38.2)	
	3	206 (70.1)	88 (29.9)	
	4	218 (77.9)	62 (22.1)	
	5	112 (73.7)	40 (26.3)	
Status	Hostelite	392 (69.5)	172 (30.5)	0.24
	Day Scholar	516 (66.5)	260 (33.5)	
Program	MBBS	340 (66.1)	174 (33.9)	0.24
	BDS	206 (70.1)	88 (29.9)	
	Nursing	144 (57.6)	106 (42.2)	
	DPT	218 (77.3)	64 (22.7)	

Figure 1 shows tiredness, dizziness, headache, and nausea/vomiting as among the most prevalent symptoms experienced by medical students who engage in self-medication with antibiotics

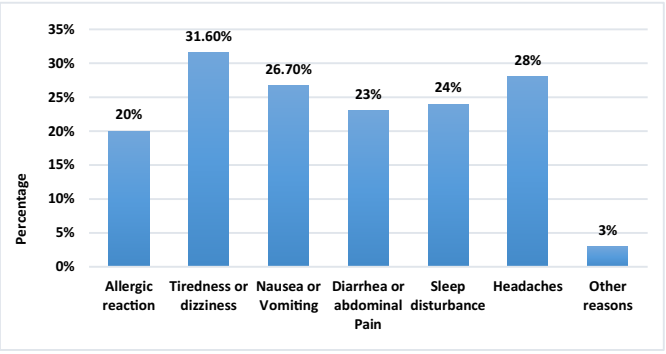

Figure 1: Adverse effects experienced with antibiotics self-medication.

DISCUSSION

Our study's conclusions show that self-medication is a prevalent practice among all medical and related field students. Females show the greatest trend. The most likely reason for this is that female students are less likely to venture outside to see a doctor or other healthcare practitioner for convenience's sake [13]. As shown in table 1, third, fourth, and final year medical students have the greatest rates of antibiotic self-medication. This finding is consistent with anecdotal reports and raises important questions about the factors contributing to this pattern. It is noteworthy that students in these specific years of medical education have typically undergone extensive clinical training and have been exposed to a broader range of medical knowledge compared to earlier years [14]. This increased exposure could potentially lead to greater self-confidence in diagnosing and treating medical conditions, which may contribute to the higher self-medication rates observed [15]. The demands of the 3rd, 4th, and final years of medical school, including clinical rotations, examinations, and the impending transition to internship or residency, can be particularly stressful [16]. Stress and workload are known factors that may lead individuals, including medical students, to self-medicate as a means of quick relief from illness, often to maintain their rigorous academic schedules [17]. This stress-induced self-medication trend warrants further investigation. Peer influence within medical school cohorts cannot be underestimated [18]. It is possible that self-medication practices become normalized within these cohorts, with students learning from one another and sharing experiences, leading to a perpetuation of this behavior [19]. Further research is needed to delve deeper into the motivations and circumstances surrounding antibiotic self-medication in these specific years. Qualitative studies and surveys can help uncover the underlying factors and attitudes that drive this practice. Peer influence is a major factor in the close-knit groups of students that define hostel situations. The sharing of medicines among peers, often without professional medical advice, can become a norm within such communities, perpetuating self-medication practices. Additionally, the relative ease of accessing over-the-counter antibiotics in nearby pharmacies might contribute to increased self-medication among hostel residents. Figure 1 shows tiredness, dizziness, headache, and nausea/vomiting as among the most prevalent symptoms experienced by medical students who engage in self-medication with antibiotics. These findings align with the well-documented adverse effects associated with antibiotic misuse, emphasizing the significance of addressing this issue within the medical student population. The high prevalence of tiredness among self-medicating medical students is concerning, as it can have detrimental effects on their academic performance and overall well-being. Fatigue may result from a variety of factors, including antibiotic side effects and potential underlying medical conditions. It underscores the importance of responsible medication practices and proper diagnosis by healthcare professionals [20]. The symptoms of tiredness, dizziness, headache, and nausea/vomiting have direct implications for the academic performance of medical students. These individuals are expected to maintain a rigorous academic schedule, and any health-related issues can hinder their ability to excel in their studies. We acknowledge certain limitations of our study, such as potential recall bias and the reliance on self-reported data. Additionally, our study may not capture all

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the factors contributing to the reported symptoms, as other variables, including stress and lifestyle factors, could play a role.

CONCLUSIONS

In conclusion, from a total of 1340 students in our survey, and equal no of students 670 (50%) was recruited from each institute. 414(61.8%) students from BUHS and 494 (73.7%) from UMDC were found to have self-medication practices. Tiredness, dizziness and headache were found to be the most common side effects experienced by the students after self-medication of antibiotics. These findings underscore the need for increased awareness and education on responsible medication usage among students in both BUHS and UMDC.

Authors Contribution

Conceptualization: SR
Methodology: MRS, SB, AN
Formal analysis: AI
Writing-review and editing: AI, AM

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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