

## ORIGINAL ARTICLE

**Self-Medication of Antibiotics Among Medical Students: A Cross Sectional Study**Ayesha Javaid<sup>1</sup>, Iram Yasir<sup>2</sup>, Saadia Zainab<sup>3</sup>, Hamza Chaudry<sup>4</sup>, Neha Amjad<sup>5</sup>, Umar Farooq<sup>6</sup>**ABSTRACT**

**Objective:** To determine the frequency and perception regarding self-medication of antibiotics among medical students of Al-Nafees medical college, Isra university.

**Study Design:** Descriptive cross-sectional study.

**Place and Duration of Study:** It was conducted in Al-Nafees Medical College from 1<sup>st</sup> April- 30<sup>th</sup> June 2019.

**Materials and Methods:** This study was conducted among medical students of Al-Nafees Medical College. A total of 220 students were included in the study, via convenient sampling technique, 44 students from each year, with male to female ratio of 1:1. A structured questionnaire comprising of 12 multiple choice questions along with a demographic details section was used to collect the data. The data was entered and analyzed using Statistical Package for Social Sciences (SPSS) version 22.0.

**Results:** Out of 220 students (mean age 21 +/-4 years), 74% of students were self-medicating. 26.8% said prior experience of use was the reason for self-medication while 2.7% wanted to maintain privacy. About 39.50% of students used antibiotics to treat fever, whereas 5.90% for genitourinary infections. About 38.2% reported that the major source of information was acquired from other students, while 7.7% from friends or internet. Type of antibiotic was put under consideration by 40.5% of the students while self-medicating, 38.6% consulted doctor for selecting dosage. Dosage was changed during course of treatment by 16.8% , major reason (28.6%) behind it was improvement in health condition. Twenty-two percent stopped taking antibiotics before course completion on disappearance of symptoms while 29.5% labelled it as an unacceptable practice.

**Conclusion:** The trend of antibiotics' self-medication is quite high among medical students which may result in an increase in antibiotic resistance.

**Key Words:** *Antibiotics, Cross sectional study, Frequency, Medical students, Prescription.*

**Introduction**

Antibiotics are medications prepared to treat or prevent bacterial infections, dispensed to patients depending on the prescription of a certified health care provider. Antibiotics are essential therapeutic agents, particularly in the developing world where infectious diseases are highly prevalent and still a leading cause of mortality.<sup>1</sup>

However, the indiscriminate use of antibiotics can lead to most health problems. A major global health public problem is the increasing use of non-prescribed antibiotics, in other words known as self-medication.<sup>2</sup> Self-medication is defined as the use of drugs to treat self-diagnosed disorders or symptoms

<sup>1,2,4,6</sup>Department of Community Medicine/Physiology<sup>3,5</sup>

Al- Nafees Medical College, Islamabad

Correspondence:

Dr. Ayesha Javaid

Assistant Professor Community Medicine

Al- Nafees Medical College, Islamabad

E-mail: dr.ayeshajavid17@gmail.com

Received: December 07, 2022; Revised: December 10, 2023

Accepted: December 12, 2023

without a prescription or guidance from a physician.<sup>3,4</sup>

Multiple factors contribute to the use of antibiotics including influence of family and friends, unchecked sales, time and financial constraints, customer attitudes and expectations and impact of media. Moreover, a few reasons for self-medication with antibiotics in low-income countries include over-the-counter sale, high cost of medical consultation, low satisfaction with doctors, and misunderstandings about the effectiveness.<sup>5,6</sup>

The inappropriate consumption of antibiotics may lead to adverse outcomes, which include antibiotic resistance, treatment failure, and drug toxicity. Widespread irrational use of antimicrobials with no background of medical consultation can ultimately result in an increased likelihood of inappropriate, incorrect, or delay in therapy along with missed diagnosis, and increased morbidity. Ultimately this may lead to chronic illnesses, frequent health care consultations, prolonged hospital stays, the

necessity for costly medications, and even mortality.<sup>7</sup> The ascent in antimicrobial resistance, due to incomplete course of treatment is harmful to individuals as well as societies.<sup>8</sup>

Antibiotic resistance is documented as the world's most predominant public health issue. The emergence of multidrug-resistant bacterial strains has raised an alarming concern about antibiotic resistance globally.<sup>9,10</sup> In Pakistan, antibiotics, along with other medicines, are readily available to the population without requiring a prescription; a similar situation is encountered in many poor countries. Throughout the years, complications of self-prescription particularly with antibiotics have achieved increasing recognition worldwide as well as in Pakistan. In Pakistan, few research have been conducted on self-medication. Surveys related to self-prescription of antibiotics in Pakistan reported prevalence of 32.5%.<sup>11</sup>

A study done in Nigeria reveals prevalence of self-medication among medical students to be high. Reasons being having satisfactory pharmaceutical information, and almost half of them purchased these medicines from the community pharmacy. Most of them used patient information leaflet for dosage and duration of medication.<sup>12</sup>

Research conducted in Nepal amongst students of nursing department in November 2016 showed that more than half of them acknowledged engaging in self-medication of antibiotics over the past one year. Fever was the most frequently treated symptom using antibiotics. The practice amongst nursing students was common due to their confidence in their medical knowledge, followed by the thinking that doctor's advice is not required for common illnesses, and to save time and money.<sup>13</sup>

Research in Saudi Arabia focused on antibiotics usage in the Middle East, addressing symptoms like cough, sore throat, and urinary tract infections. Self-medication was prevalent due to poorly implemented policies on antibiotic availability, socio-economic factors, the belief in the efficacy of antibiotics for quicker recovery, and the practice of storing antibiotics at home for self-administration or sharing among family and friends.<sup>14</sup>

The research in Mekelle, Ethiopia, focused on self-medication among Health Sciences students, revealing a 50% prevalence of the practice. Common

ailments prompting self-medication included headaches, cough/common cold, dysmenorrhea, and dyspepsia. Students cited personal experience and perceived mildness of conditions as key motivations. Accessibility of drugs in informal settings, such as open markets and kiosks, played a significant role in the widespread adoption of self-medication among the student population.<sup>15</sup>

Keeping in view the situation regarding self-medication of antibiotics among medical students, limited studies have been done in the local context. Therefore, this study was performed with the objective of assessing the magnitude of this problem.

### Materials and Methods

This descriptive cross-sectional study was performed on MBBS students of Al-Nafees Medical College for duration of 2 months from 1st April- 30th June 2019. A total of two hundred and twenty students were selected using Raosoft sample size calculator at 95% confidence interval and 5% margin of error. Among them 110 were males and 110 were females. Students who gave consent were included in the study. Data was collected simultaneously from students in five academic years, encompassing first year to final year. The sample included a total of 44 students, with an equal distribution of 22 males and 22 female. Convenient non-probability sampling technique was used. Verbal informed consent was taken, after approval by the Institutional Review Committee.

A self-administered, pre-tested self-constructed questionnaire was used as a tool to conduct this study with closed ended questions. Pre-testing was done by conducting a pilot study on 10 participants whose data was not used in the results. The questionnaire gathered demographic data such as name, age, gender, and education level of participants. It also contained 12 multiple choice questions. Participants were asked whether they have ever treated themselves with antibiotics or not. Participants who confirmed self-medication were asked the reason, purpose, source of information, frequency, usage and name of antibiotics.

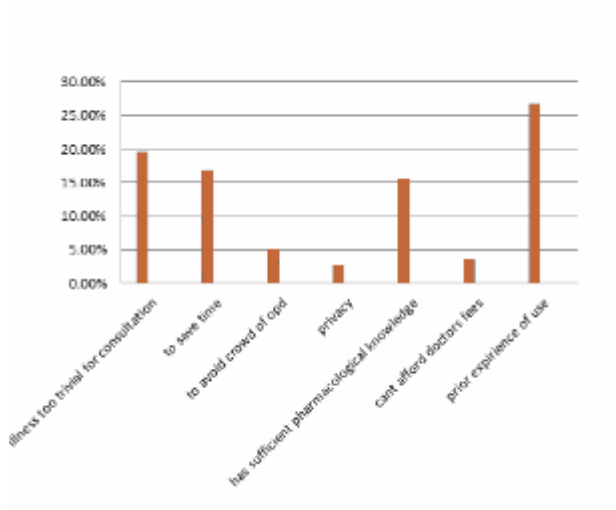
SPSS version 22 was used for data entry and analysis. Descriptive statistical analysis was carried out to document frequencies and percentages of study variables.

**Results**

**Table I: Demographic Profile**

Demographic Profile	Number	Percentage (%)
<b>Class</b>		
1 <sup>st</sup> year	44	20
2 <sup>nd</sup> year	44	20
3 <sup>rd</sup> year	44	20
4 <sup>th</sup> year	44	20
5 <sup>th</sup> year	44	20
<b>Gender</b>		
Male	110	50
Female	110	50
<b>Age Groups</b>		
17-19	38	17.2
20-22	125	56.8
23-25	57	25.9

The major use of antibiotics was due to prior experience of use that is 26.8% while 2.7% wanted to maintain the privacy as shown in figure 1.

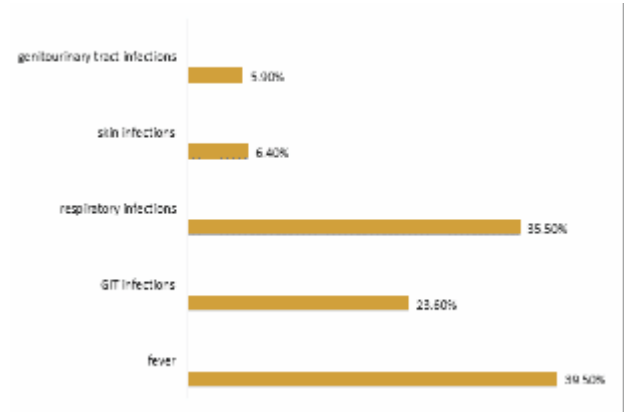


**Figure 1: Reasons for Self-Prescription of Antibiotics**

The most common complaints students reported for self-treating with antibiotics were fever followed by respiratory tract infection, GIT infections, skin infection and genitourinary infections.

**Source of Information**

The major source of information to take antibiotic for self-prescription was from old prescription whose frequency was 38.2 % among the students, followed by use of antibiotic by some other family member that is 29.1 % common. Some community pharmacists also recommended common antibiotics (16.4%). Other sources of antibiotics included drug advertisement sources (7.7%) and friends or internet (3.6%).



**Figure 2: Common Complaints for Using Antibiotics.**

**Antibiotic Selection**

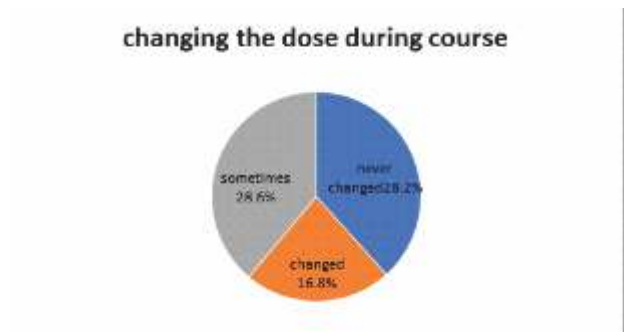
While selecting an antibiotic people considered multiple factors. In our survey 40.5% of students considered the type (group) of antibiotics, 15.9% chose antibiotic with minimal side effects, 13.2% chose according to brand name, 4.1% consider the prices of antibiotic.

**Frequency and Usage**

According to the survey 38.6% took according to consultation of a doctor, 19.5% of participants checked the package insert in the medicine for getting knowledge regarding dose for self-prescribed antibiotic, 3.6% by consulting a pharmacist. 1.4% used antibiotics by consulting a senior at university, 4.1% by the help of lecture notes and 6.4% consulted internet for correct antibiotic dosage.

**Change of Dosage**

The frequency of students who changed the dosage of antibiotic during the course was 16.8% while 28.2 % people never changed the antibiotic or its dose during the course. On the other hand, 28.6% changed the antibiotics sometimes as shown in figure III.



**Figure 3: Frequency of Students Who Changed the Dosage of Antibiotic During the Course.**

### Reason Behind Change of Dosage

In our study, one of the major reason behind the change of dosage was due to improvement in students' health (28.6%) while 9.5% changed it due to worsening conditions. There is a small percentage of 11.4% students who changed the dose to reduce the side effects of antibiotics.

### Cessation of Antibiotic Intake

When we explored the reasons behind cessation of antibiotic intake, we saw that 21.8% stopped taking antibiotics after their symptoms disappeared while 14.5% stopped taking antibiotics after few days of recovery. Some of them stopped taking antibiotics after few days regardless of their outcome their frequency was 4.5%, 2.7% stopped taking after antibiotics ran out, 29.5 stopped taking after completion of the course, and 1.8 stopped taking antibiotics after consulting a doctor.

### Experiencing Adverse Reaction

Some people experienced an adverse reaction, and their frequency was 18.2%, while 55.5% did not experience any adverse reaction. The people who had experienced an adverse reaction 25% of them stopped taking antibiotics, 7.3% switched to other antibiotics, 30.5% consulted a doctor, some of them consulted a pharmacist their frequency was 0.5%, 0.9% consulted their family or friends while 9.5% did not consult anyone.

### Opinions About Self Prescription

Twenty percent of the subjects thought that self-medication was a good practice, 24.5% considered it as an acceptable practice, and 29.5% labelled it as an unacceptable practice.

Among people who self-medicate with antibiotics, 33.6% of them speculated that they could successfully treat infectious disease all by themselves, 30.5% among were not sure, while 10% of them thought they couldn't treat it.

### Discussion

Self-medication is the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms.<sup>16</sup> Historically people have shown vigilance regarding their health for which they have practiced self-medication. Self-medication has its pros and cons but that varies with who uses it and how it is used.<sup>17</sup> This study was conducted to assess the frequency of self-medication among the medical students of Al-Nafees medical college which was

found to be 74%, that is closely similar to 74.4% found in the study conducted among the medical students of south-east of Iran.<sup>18</sup> In another research a higher rate of 88% was recorded by Bangladeshi Undergraduate Pharmacy Students.<sup>19</sup> Kumari R did similar observation among the medical students of Jammu, with the percentage of 79%.<sup>20</sup> While a lower frequency was found in the study among medical college students in West Bengal.<sup>21</sup>

In our study two most frequently reported reasons for self-medication were previous experience (26.8%) and illness too trivial to be consulted (19.5%). Similar findings were reported in studies conducted in Iran<sup>22</sup> and Karachi.<sup>23</sup> Different surveys also stated that low severity of illness being one of the major reasons for self-prescription.<sup>24</sup> However, another study stated that the commonest reason for students to practice self-medication was saving time.<sup>25</sup> In another research done by Gupta V among the students in Malwa Punjab the most widely reported reason for self-medication was for quick relief.<sup>26</sup>

In present study 15.5% students responded themselves as having sufficient pharmacological knowledge this resulted in our prevalence rate being lower as compared to rate of 45% in a study stated by medical students of coastal south india.<sup>25</sup>

In the present study the majority (38.2%) of the students gained knowledge about self-medication from the formerly prescribed medicines by physicians. Our data coincided with the research work conducted in the past.<sup>19</sup> Similar results could be seen in research work conducted by Pereira C.M from two Brazilian universities.<sup>27</sup> Fever 35.50% and respiratory infection 39.50% were the most common complaints reported by students followed by GIT infections, skin infection and genitourinary infections. Conversely, the most predominant symptoms stated in the prior study in Asmara, Eritrea were wound infection and sore throat.<sup>28</sup> Similar to some previously published articles, headache, common cold, fever, pain, and vomiting were the most common symptoms for self-administration of medications mentioned by the participants.<sup>29</sup>

Multiple studies have identified a higher rate of self-medication with antibiotics in Asia, ranging from 4% to 7.5%. This prevalence surpasses that observed in Northern Europe, where the self-medication rate

with antibiotics is reported to be 3%.<sup>30</sup> Our study considered only antibiotics self-medication. On the contrary, according to the study conducted by medical students of Karachi<sup>23</sup> analgesics were commonly used followed by antipyretics and antibiotics; the study conducted by Abrar Hussain Azad also reported analgesics to be the most widely used drug group (51%) followed by antibiotics contributing 44.3% of the total share.<sup>31</sup>

Self-medication has become prevalent throughout the world. Although, when practiced with caution in a community with good literacy rate and with limited classes of drug, is time saving and cost effective for the patients where professional care is comparatively expensive and not available promptly but at the other hand, misuse of these drugs can lead to numerous health hazardous.

### Strengths and limitations

The strength of this study is that this kind of study has never been done on medical students in Pakistan where its frequency seems to be high, and antibiotics are available over the counter without any prescription. Limitation is the non-probability sampling technique and single centered study.

### Conclusion

The trend of antibiotics' self-medication is quite high among medical students which may result in an increase in antibiotic resistance. This needs to be evaluated further. Awareness programs about hazards of self-medication can be run in the community. The reasons for self-medication should be addressed appropriately. Legislations for over-the-counter antibiotic sale should be made and enforced in our country. Pharmacists should be counseled for not dispensing drugs without prescription.

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#### CONFLICT OF INTEREST

Authors declared no conflicts of Interest.

#### GRANT SUPPORT AND FINANCIAL DISCLOSURE

Authors have declared no specific grant for this research from any funding agency in public, commercial or nonprofit sector.

#### DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon request.

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