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Self-Medication with Antimicrobials among Medical Students of Bangladesh during the COVID-19 Pandemic: A Cross-Sectional Study

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ABSTRACT

Background: The COVID-19 pandemic disrupted healthcare access globally, potentially increasing unsupervised antibiotic use. Self-medication with antimicrobials among medical students is of particular concern due to their future prescribing role and its implications for Antimicrobial Resistance (AMR). The objective of the study was to describe the pattern of antimicrobial use as self-medication among the undergraduate medical students of Bangladesh during COVID-19 pandemic.

Materials and methods: A descriptive cross-sectional study was conducted from October 2020 to February 2021 among 4th-year MBBS students from 14 medical colleges (Five government, Nine non-government) in Bangladesh. Data were collected via a validated online questionnaire covering demographics, antimicrobial use without prescription and reasons for such practice.

Results: Of 916 respondents, the prevalence of antimicrobial self-medication was 22.06%. Among these, 75.24% used a single drug, 16.83% used two drugs and 7.92% used three concurrently. Azithromycin was most frequently used (52.47% of self-medicators), followed by doxycycline (16.83%) and ivermectin (15.84%). Fever, sore throat and dry cough were the most reported symptoms.

Conclusion: Despite medical training, a considerable proportion of students engaged in unsupervised antimicrobial use during the pandemic. Strengthened antimicrobial stewardship education is essential to address irrational prescribing habits early in medical careers.

KEY WORDS

Antimicrobials; COVID-19; Medical students; Self-medication.

INTRODUCTION

Self-medication, defined as the autonomous selection and consumption of medicines for self-diagnosed conditions without professional medical consultation, is a widespread global practice.[1] While it can offer benefits such as saving time, reducing healthcare costs and empowering patients to manage minor ailments, inappropriate self-medication particularly with antimicrobialscan have severe consequences. These include the emergence of Antimicrobial Resistance (AMR) adverse drug reactions, misdiagnosis and masking of underlying diseases.[2,3] AMR, in particular, poses a significant public health threat, potentially rendering many current treatments ineffective, thereby increasing morbidity, mortality and healthcare expenditure.[4-6]

In many Low and Middle-Income Countries (LMICs) including Bangladesh, weak pharmaceutical regulatory enforcement allows easy over-the-counter access to antibiotics.[7-8] This is compounded by high infectious disease burdens, gaps in public awareness and misconceptions about the efficacy of antibiotics against viral infections.[9]

The COVID-19 pandemic placed unprecedented strain on healthcare systems worldwide, disrupting access to medical services and fostering uncertainty about effective treatments.[10-13] Lockdowns, fear of hospital-acquired infections and a proliferation of unverified treatment claimsamplified by social media, created an environment conducive to increased self-medication with antimicrobials, often without evidence-based justification.[14,15]

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Medical students are a particularly important group in this context. As future prescribers, they possess preliminary pharmacological knowledge but may lack the clinical maturity to make fully informed prescribing decisions.[16,17] Studies in various countries have reported variable rates of antimicrobial self-use among medical students, but the COVID-19 pandemic presents a unique setting characterized by heightened anxiety, misinformation and easy access to drugs.[13,18] Patterns established during medical school can influence future prescribing behaviors, making this a critical area of investigation.

In Bangladesh, there is limited evidence on the prevalence and determinants of antimicrobial self-medication among medical students during the pandemic. This study aimed to determine the prevalence of antimicrobial self-medication among the medical students of Bangladesh during COVID-19, identify the most commonly used antimicrobial agents and explore the underlying reasons and illness profiles associated with this practice.

MATERIALS AND METHODS

This was a descriptive cross-sectional study conducted in the Department of Pharmacology & Therapeutics of 14 Medical Colleges of Bangladesh including government (Armed Forces Medical College, Cumilla Medical College, Manikganj Medical College, Jashore Medical College Manikganj and Rangpur Medical College) and non-government medical colleges (Army Medical College Bogura, Army Medical College Chittagong, BGC Trust Medical College, Brahmanbaria Medical College, Chattogram International Medical College, Jalalabad Ragib-Rabeya Medical College, Sylhet, Khwaja Yunus Ali Medical College, Sirajganj, Medical College for Women, Dhaka and US-Bangla Medical College, Narayanganj) from October 2020 to February 2021. Study was conducted among the 4th year MBBS students of studied medical colleges and total 916 medical students participated in this study. A structured questionnaire was used for data collection and questionnaire was validated before survey. Ethical approval was taken from the Institutional Review Board (IRB) of BGC Trust Medical College, Chittagong. Permission was taken from college authorities and informed consent was taken from the participants of the Structured Questionnaire Survey. Researchers explained the nature and purpose of the survey to the students during a virtual class. This self-administered questionnaire was linked in google form and was distributed among study population through email, messenger, whatsapp and other social media who gave consent. To assure the quality, students filled and submitted the questionnaire quickly during end of class. Later, this web-based questionnaire was sent to students who were absent in the class through email. A reminder mail or message was given on 7th day and 15th day of the primary one. The response generated by the students was received through google drive and it did not accept double response from same participant. To maintain confidentiality, responses were anonymous.

Data was compiled, presented andanalyzed using Microsoft Excel and was expressed as percentage.

RESULTS

Nine hundreds and sixteen respondents were covered during the study period, of which 326 (35.59%) were males and 590 (64.41%) were females.

Table I Distribution of demographic characteristics of respondents (n=916)

Variables	Frequency	Percentage (%)
Gender		
Male	326	35.59
Female	590	64.41
Type of institution		
Government	477	52.08
Non-government	439	47.93

Overall prevalence of self-medication with antimicrobials among medical students was 22.06% (Figure 1).

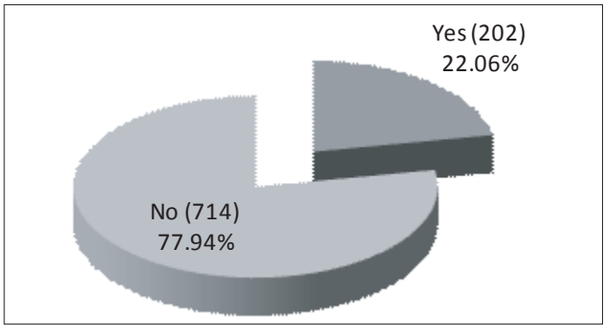

Figure 1 Overall prevalence of self-medication with antimicrobials among medical students (n=916)

Figure 2 showed that among 202 students, 152 (75.24%) took at least one antimicrobial drug, whether 34 students (16.83%) and 16 students (7.92%) took two drugs combination and three drugs combination respectively.

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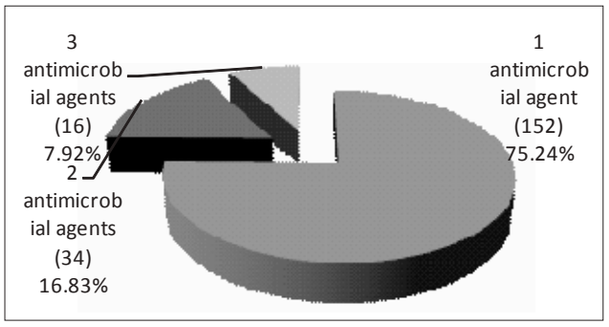

Figure 2 Pattern of antimicrobial consumption (n=202)

Figure 3 showed that azithromycin (52.47%) was the mostly used anti-infective agent as self-medication, followed by doxycyline (16.83%) and ivermectine (15.84%).

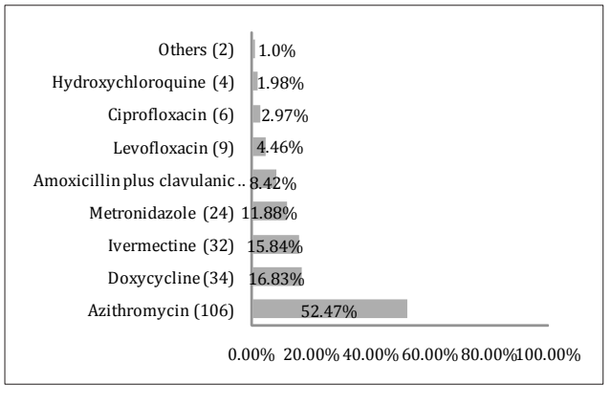

Figure 3 Antimicrobials used as self-medication (n=202)

As shown in Figure 4, fever (81.68%) was the most common reported illness followed by sore throat (53.96%) and dry cough (46.09%) for which antimicrobial was taken.

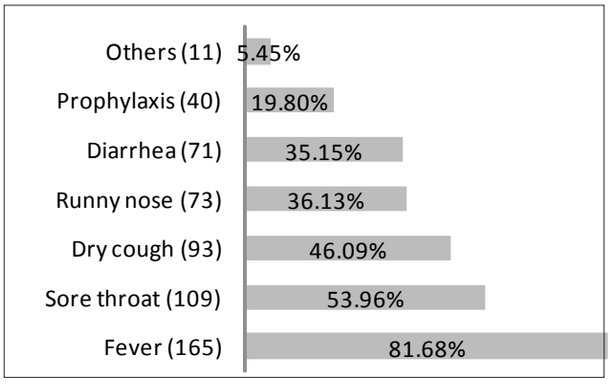

Figure 4 Reasons for antimicrobial self-medication (n=202)

DISCUSSION

This study found that more than one in five medical students of Bangladesh engaged in antimicrobial self-medication during the COVID-19 pandemic, despite their medical training. Although this prevalence is lower than some pre-pandemic reports among the general public in Bangladesh, it remains concerning because these students are future prescribers whose habits will influence patient care.[19]

The predominance of azithromycin aligns with early-pandemic global trends, fueled by anecdotal and preliminary reports suggesting antiviral benefits, despite insufficient supporting evidence.[14,20] Doxycycline and ivermectin use mirrors similar patterns seen in other LMICs, where accessibility, low cost and social media promotion contributed to their popularity.[9]

The research finding showed that fever was the most frequently reported symptom prompting antimicrobial use, followed by sore throat and dry cough. This pattern aligns with early-pandemic perceptions of these symptoms as indicative of COVID-19, potentially contributing to the high rates of empirical antimicrobial use despite viral etiologies.[21]

The use of multiple antimicrobialsthough less frequent, carries risks including drug-drug interactions, additive toxicities and increased selection pressure for resistant organisms.[22]

From a public health perspective, such practices among medical students are troubling for two main reasons. First, inappropriate antimicrobial use directly contributes to AMR, a global health emergency.[4] Second, self-medication behaviors formed during training may translate into future prescribing patterns that perpetuate irrational antimicrobial use.[5]

These findings underscore the urgent need to integrate comprehensive antimicrobial stewardship education into undergraduate medical curricula. Interactive, case-based learning on appropriate antimicrobial selection, resistance mechanisms and consequences of misuse could foster more rational prescribing attitudes. In parallel, stricter regulation of over-the-counter antibiotic sales in Bangladesh would reduce easy access and promote professional consultation.[4,5]

CONCLUSION

Self-medication with antimicrobials was prevalent among Bangladeshi medical students during the COVID-19 pandemic, often involving drugs with limited or no proven efficacy against SARS-CoV-2. These behaviors, driven largely by perceived mild illness and prior experience, highlight the importance of early interventions in medical education to promote rational drug use. Strengthening antimicrobial stewardship training and regulating non-prescription antibiotic access are essential to combat future inappropriate prescribing and mitigate AMR.

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DISCLOSURE

All the authors declared no competing interest.

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