

# Self-Medication with Antibiotics among Medical Students in Karachi: A Cross-Sectional Institution Based Study

**Hunain Asif (1)**  
**Tafazzul Hyder Zaidi (2)**  
**Kiran Mehtab (3)**  
**Marina Aziz (1)**  
**Khadija Khalid (1)**  
**Maham Shamim Shaikh (1)**  
**Mahnoor (1)**  
**Sidra Zai (1)**  
**Batool Zehra (1)**  
**Maryam Nadeem (1)**  
**Mirza Muhammad Hashim (1)**  
**Ramal Fatima (1)**  
**Syed Muhammad Abbas (1)**  
**Warda Batool (1)**

(1) Sindh Medical College, Jinnah Sindh Medical University, Karachi  
(2) Associate Professor, Community Medicine Department, Sindh Medical College, Jinnah Sindh Medical University, Karachi  
(3) Professor and Head Of Department, Department of Community Medicine, Liaquat College of Medicine & Dentistry, Karachi

## **Corresponding author:**

Dr Syed Tafazzul Hyder Zaidi, MBBS, MSPH  
Associate Professor, Community Medicine Department,  
Sindh Medical College, Jinnah Sindh Medical University,  
Karachi  
Cell No: 00 92 300 923 26 95  
**Email:** Drtaf2002@yahoo.com

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## Abstract

### Objectives:

- 1) To identify the factors responsible for students self-medicating with antibiotics in medical students at Sindh Medical College, Jinnah Sindh Medical University, Karachi.
- 2) To determine the class of self-medicating antibiotics used by medical students at Sindh Medical College, Jinnah Sindh Medical University, Karachi.

### Study Design:

A Cross-sectional study.

### Study Place:

Sindh Medical College  
Jinnah Sindh Medical University, Karachi

### Study Duration:

March 01, 2018 To June 04, 2018

### Sampling Technique:

Non-Probability Purposive Sampling

### Method:

A cross sectional study was conducted on a sample size of 359 students. The sample was taken through non-probability convenient sampling from all 05 batches of Sindh Medical College, Jinnah Sindh Medical University, Karachi within the month of January 2018 and informed verbal consent was taken from the participants. A pilot study was conducted to assess the authenticity of the questionnaire. A structured questionnaire was then distributed, was filled out and the data was entered and analyzed using SPSS version 23.0 with 95 % confidence interval in margin of error 5 % and p value of less than 0.05 was considered as statistical significance.

### Results:

The percentage of self-medication among students of Sindh Medical College, Jinnah Sindh Medical University, Karachi is 52.1%. Age groups were (16-18 = 14.5%, 19-21 = 58.2% and 22-24 = 27.3%). Participants from all years were (01st = 20.6%, 02nd = 19.5%, 03rd = 20.6%, 04th = 19.5% and 05th = 19.8%). The minimum days an antibiotic course should be continued from the collected data were (3-5 Days = 69.6%). The most hazardous outcome of using inappropriate antibiotics reported by the students was (Drug resistance = 40.4%). The most frequently used antibiotics were (Co-amoxiclav = 11.7%, Metronidazole = 5.8%). Students normally stop taking antibiotics (At the completion of course = 42.1%, After symptoms disappear = 31.5%, After consulting doctor = 10.6%).

### Conclusion:

This study suggests that students of Sindh Medical College, Jinnah Sindh Medical University, were found to self-medicate themselves with antibiotics. However, knowledge about drug resistance is required at individual level in order to refrain from doing so. In consideration of these results, adequate measures should be taken to educate students regarding the hazardous side effects of antibiotics.

### Key words:

Self-medication, Antibiotics, Karachi, Medical students

## Introduction

Self-medication is described as the use of medicines by a person on his own or on the proposition of a nonprofessional or a lay person instead of seeking guidance from a health care provider (1,2). In the field of medicine, a prescription is written by a medical practitioner that enables a person to be issued with medicine from the competent authorities. Over the counter medicines are also included in the term of self-medication. It is an emerging problem in the developing countries, due to lack of knowledge and convenience for people. Due to this practice and especially with antibiotics, the strains of multiple bacteria are becoming resistant, leading to more complications. Self-medication increases the likelihood of improper use of drug and drug dependency along with masking the signs and symptoms leading to a delayed diagnosis (3). "Most antibiotic resistance mechanisms are

associated with a fitness cost that is typically observed as a reduced bacterial growth rate. The magnitude of this cost is the main biological parameter that influences the rate of development of resistance, the stability of the resistance and the rate at which the resistance might decrease if antibiotic use were reduced (4). According to a study conducted by Kumarasamy et al in India, the appearance of the super bacteria New Delhi metallo beta lactamase 1 (NDM1) positive Enterobacteriaceae in 2010, which were highly resistant to many antibiotic classes, has raised alarm about antibiotic resistance (5). As well as the people of a country, medical students are also using antibiotics without a doctor's prescription. Several studies have been conducted for both general population and students involved in health care. According to Damian and Lupușoru in 2014 in Romania self-medication with antibiotics has been recorded among university students internationally from which 44% was found in Romania (6) and according to Fadare and Tamuno in 2011, it was found to be 39%

in Nigeria (7). According to Kumarathunga in 2010 the practice of self-medication in South Asian countries, such as Sri Lanka was found to be 13% (8). According to a study conducted by Banerjee and Bhadury in India in 2012, self-medication was widely practiced among the students of medical colleges (9). In this situation, faculties should create awareness and educate their students regarding advantages and disadvantages of self-medication. According to a study conducted in Karachi, Pakistan in the year 2017; out of 320 participants prevalence of self-medication was 66%, out of which antibiotic self-medication prevalence was 39% from different universities (10).

Self-medication has been reported throughout the world. In developing countries people are not only using non-prescription drugs like painkillers; but prescription drugs such as antibiotics without supervision of a health care provider. The World Health Organization has emphasized on the fact that steps to be taken to teach and to control self-medication properly (11 12).

Two terms are often used; 'misuse' and 'abuse' of medicines. The terms are often used conversely, but they have precise meanings in the dictionary. Misuse is used in the context of medicine as using an OTC (over the counter) drug for a justifiable medical reason, but in inappropriate doses or for a longer duration than recommended. Abuse of drug is the use without a medical purpose (13).

In the developing countries, antibiotics which are used to treat potentially life threatening bacterial infections and are also for prophylaxis are available as OTC (over the counter) drugs. They are easily available without prescriptions. Although these medicines are available from many pharmaceutical companies and are intended for self-medication, due to lack of knowledge in terms of efficacy and safety they are not properly understood. Antibiotics can cause resistance and their inappropriate use due to lack of knowledge of their side effects and interactions could bring serious complications, especially in groups like children and lactating mothers (14).

In a systematic review and meta-analysis of the burden, risk factors and outcomes of using antibiotics in developing countries, Moses Ocan et al, in 2015 included a total of 34 studies involving 31,340 participants. The overall prevalence of antimicrobial self-medication was (38.8%) at (95%) confidence interval. Most studies evaluated non-prescription use of (50%) antibacterial agents. The common complaints treated were respiratory (50%), fever (47%) and gastrointestinal (45%). Side effects of antibiotic self-medication reported were, allergies (5.9%), lack of cure (11.8%) and causing death (5.9%). The commonly reported positive consequence was recovery from illness (11.8%) (15).

Our study aimed to find out the frequency of self-medication with antibiotics among medical students of both preclinical and clinical setups at Sindh Medical College, Jinnah Sindh Medical University Karachi.

## Methodology

A cross sectional study was conducted on a sample size of 359 students. The sample was taken through non-probability convenient sampling from all 05 batches of Sindh Medical College, Jinnah Sindh Medical University, Karachi. Within the month of January 2018 informed verbal consent was taken from the participants. A pilot study was conducted to assess the authenticity of the questionnaire; the structured questionnaire was then distributed, filled out and the data was entered and analyzed using SPSS version 23.0 with 95% confidence interval in margin of error 5% and p value of less than 0.05 was considered as statistical significance.

## Results

The percentage of self-medication among students of Sindh Medical College, Jinnah Sindh Medical University, Karachi is 52.1%. The response rate was 98.8%. The percentage of male participants were 25.1% and female participants were 74.9%. Age groups were (16-18 = 14.5%, 19-21 = 58.2% and 22-24 = 27.3%). The cross tabs were done between age groups and following variables.

Participants from all years were (01st = 20.6%, 02nd = 19.5%, 03rd = 20.6%, 04th = 19.5% and 05th = 19.8%) (p value = 0.000).

The minimum days an antibiotic course should be continued from the collected data were: (3-5 Days = 69.6%), when infection ends = 10.9%, Don't know = 10.3%, 1-2 Days = 4.5%, No course = 1.4%, When packet finishes = 0.8%) (p value = 0.000).

The most hazardous outcome of using inappropriate antibiotics were: (Drug resistance = 40.4%, Don't know = 17.3%, Diarrhea = 10.6%, Decreased immunity = 10.0%, Nausea = 8.4%, Vomiting = 6.7%, Rash and No effect = 2.8%) (p value = 0.000).

The most frequently used antibiotics were: (Co-amoxiclav = 11.7%, Metronidazole = 5.8%, Amoxicillin = 3.9%, Erythromycin = 3.1%, Ciprofloxacin = 2.8%, Cefixime = 2.2%, Azithromycin = 1.9%, Others = 1.9%, Levofloxacin = 1.7%, Doxycycline = 0.3%). Antibiotics in combination used were (Co-amoxiclav and Metronidazole = 8.4% and Amoxicillin and Co-amoxiclav = 6.7%, Erythromycin and Metronidazole = 0.6%, Metronidazole and Levofloxacin = 0.3%) (p value = 0.004).

Students normally stop taking antibiotics: (At the completion of course = 42.1%, After symptoms disappear = 31.5%, After consulting doctor = 10.6%, After antibiotics finished = 4.7%, A few days after recovery = 3.6%, After asking family or relative = 0.8%, Others = 0.6%, After consulting a doctor and at completion of course = 1.9%, After consulting a doctor and after symptoms disappear = 1.4%, After antibiotics finished and a few days after recovery = 0.3%) (p value = 0.002). Cross tabs of age group with other variables is shown on opposite page.

Figure 1: The age group of participants in the study

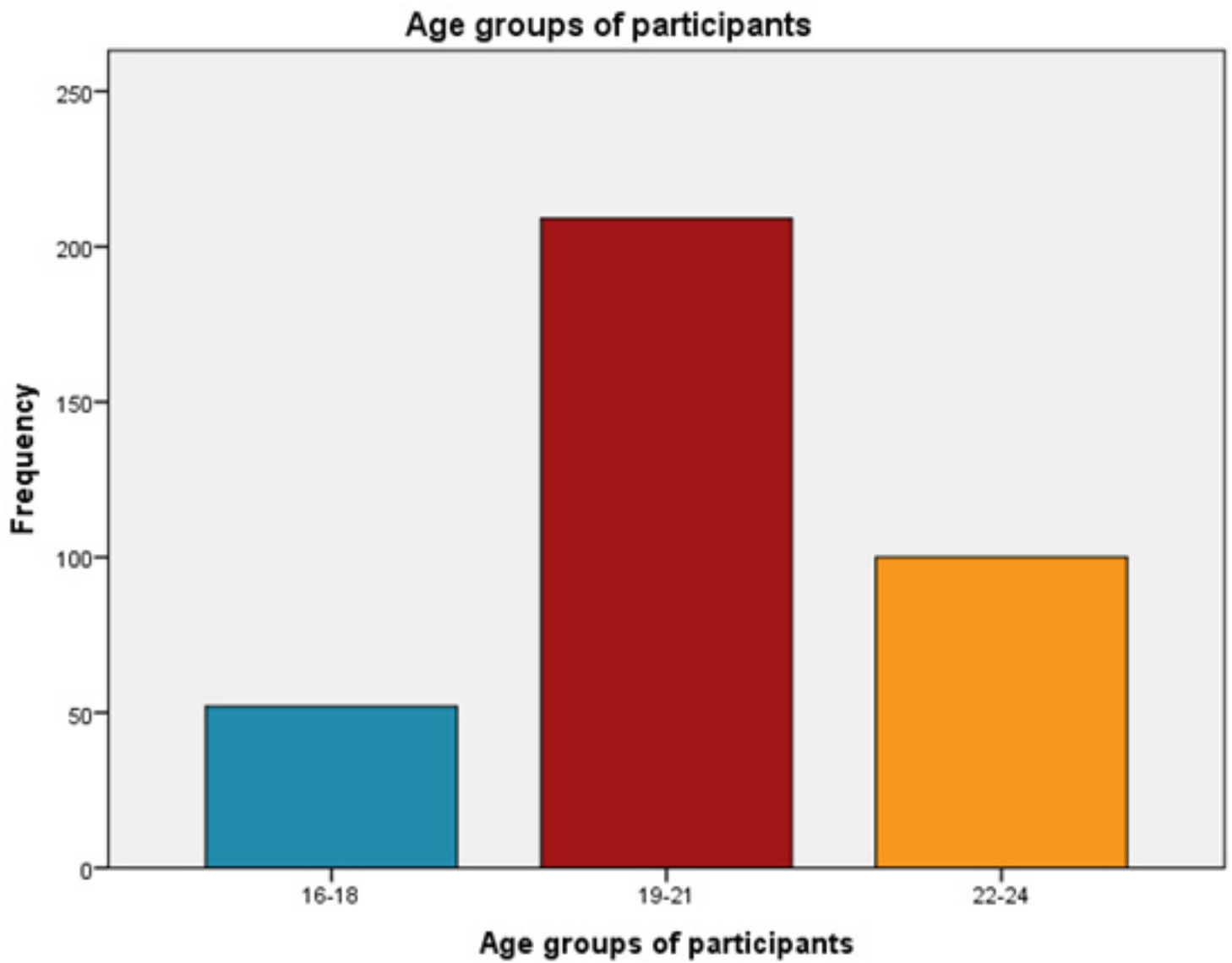


Figure 2 shows that Participants from all years were distributed as First Year 20.6%, Second Year 19.5%, Third Year 20.6%, Fourth Year 19.5% and Final Year were = 19.8% (p value = 0.000).

Figure 2: The year of study of participants in the study

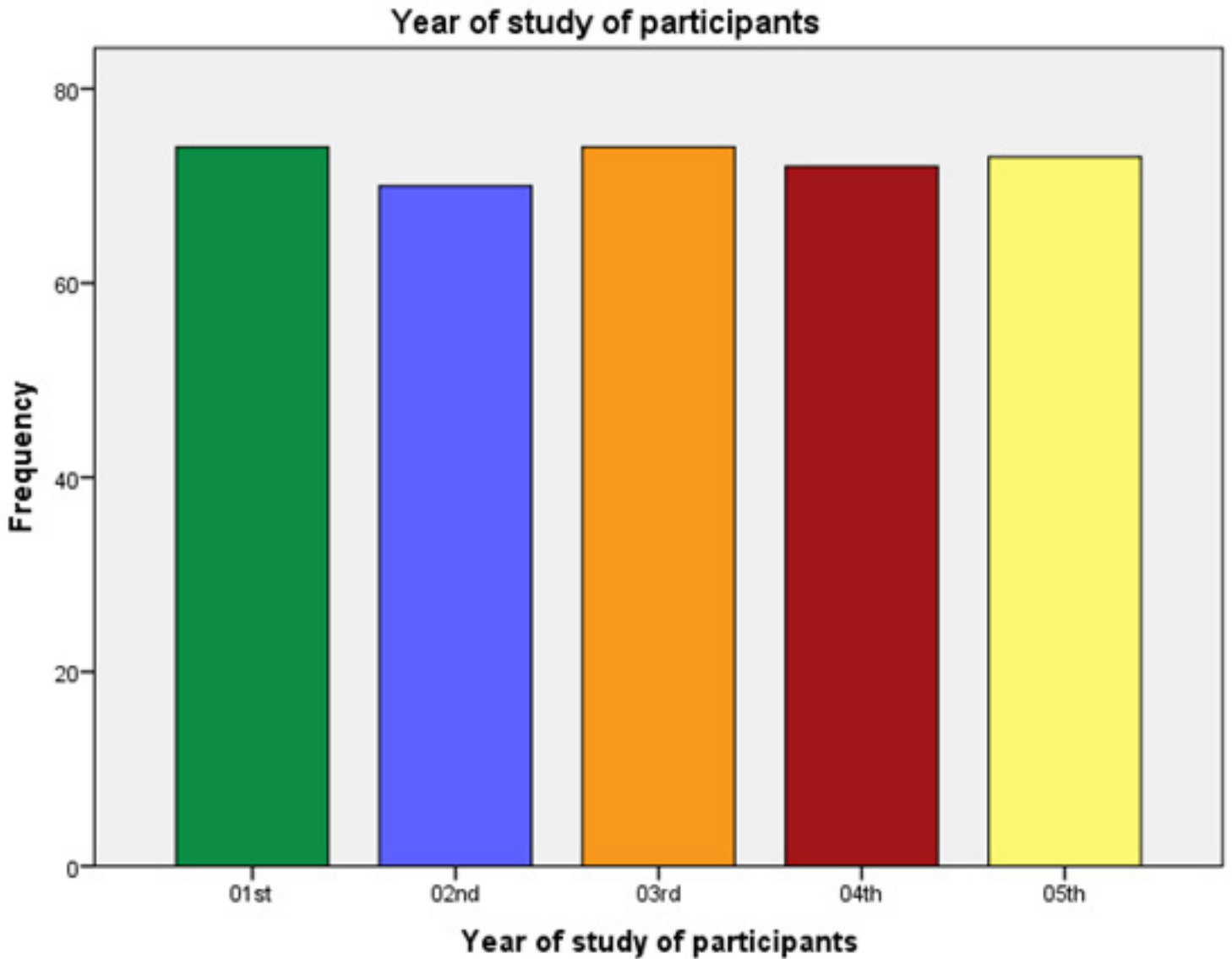


Figure 3 shows the responses of the participants when asked 'The minimum days an antibiotic course should be continued'. The responses showed that from 1-2 Days was stated by 4.5%, 3-5 Days was stated by 69.6%, When infection ends was stated by 10.9%; those who did not know were 10.3%, No course was stated by 1.4% and When packet finishes was quoted by 0.8% (p value = 0.000).

Figure 3: Frequency of course of antibiotics followed by medical students

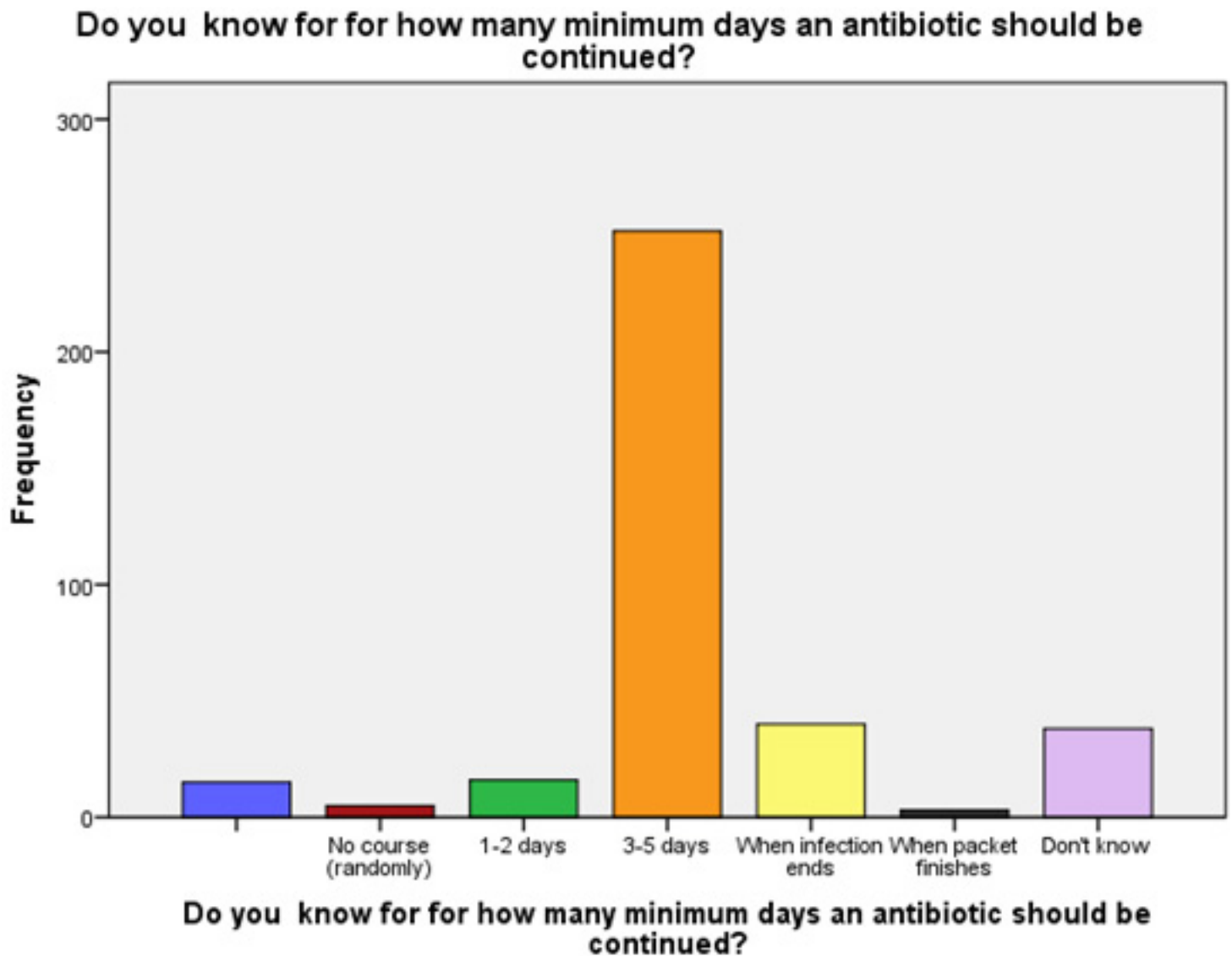


Figure 4 shows that when asked about the most hazardous outcome of using inappropriate antibiotics it was responded to as: drug resistance which was reported by 40.4%, those who did not know were 17.3%, diarrhea was stated by 10.6%, decreased immunity was mentioned by 10.0%, nausea was the response of 8.4 %, vomiting by 6.7%, rash and no effect was quoted by 2.8% ( $p$  value = 0.000).

Figure 4: Frequency of hazardous outcomes of antibiotics as reported by participants

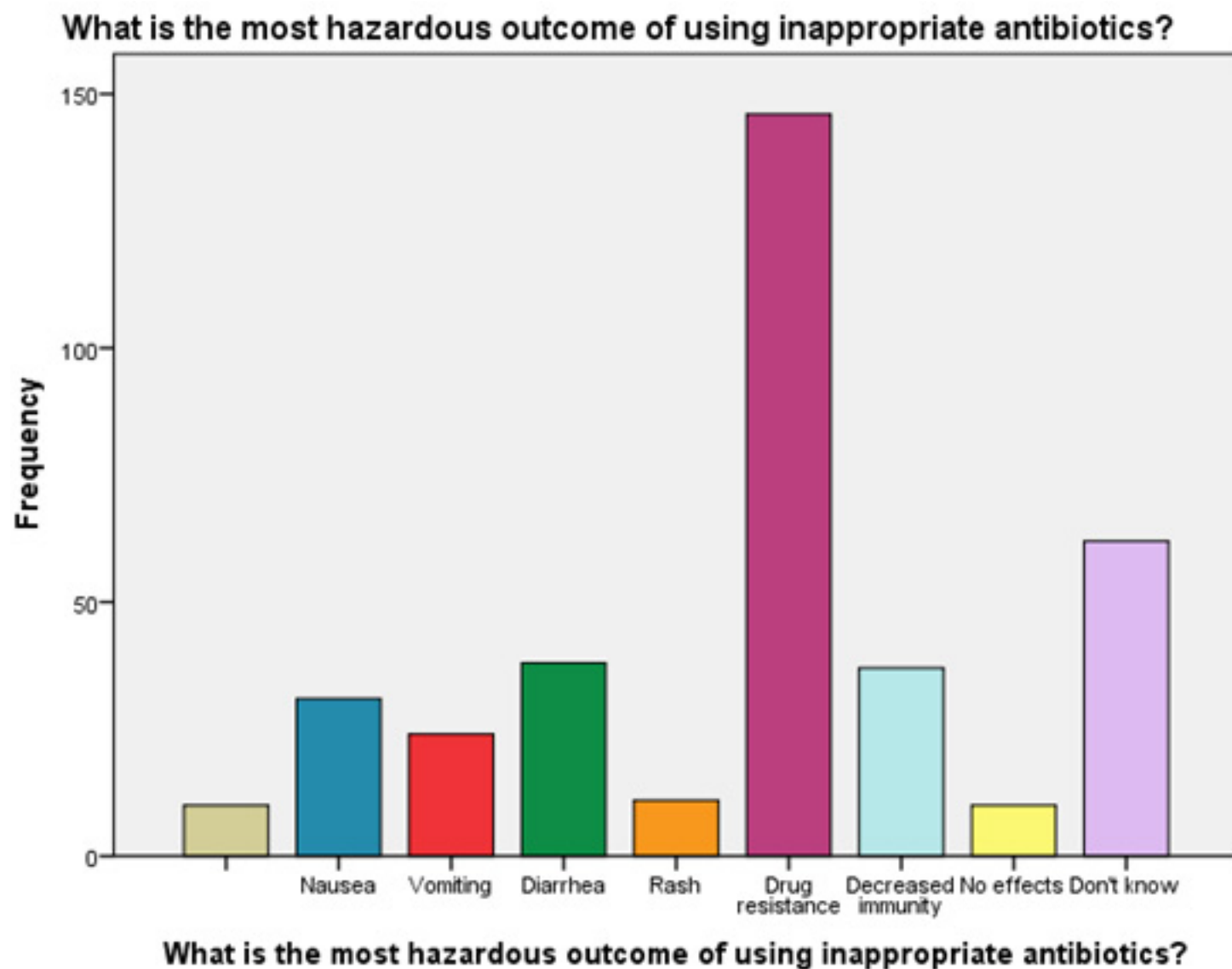
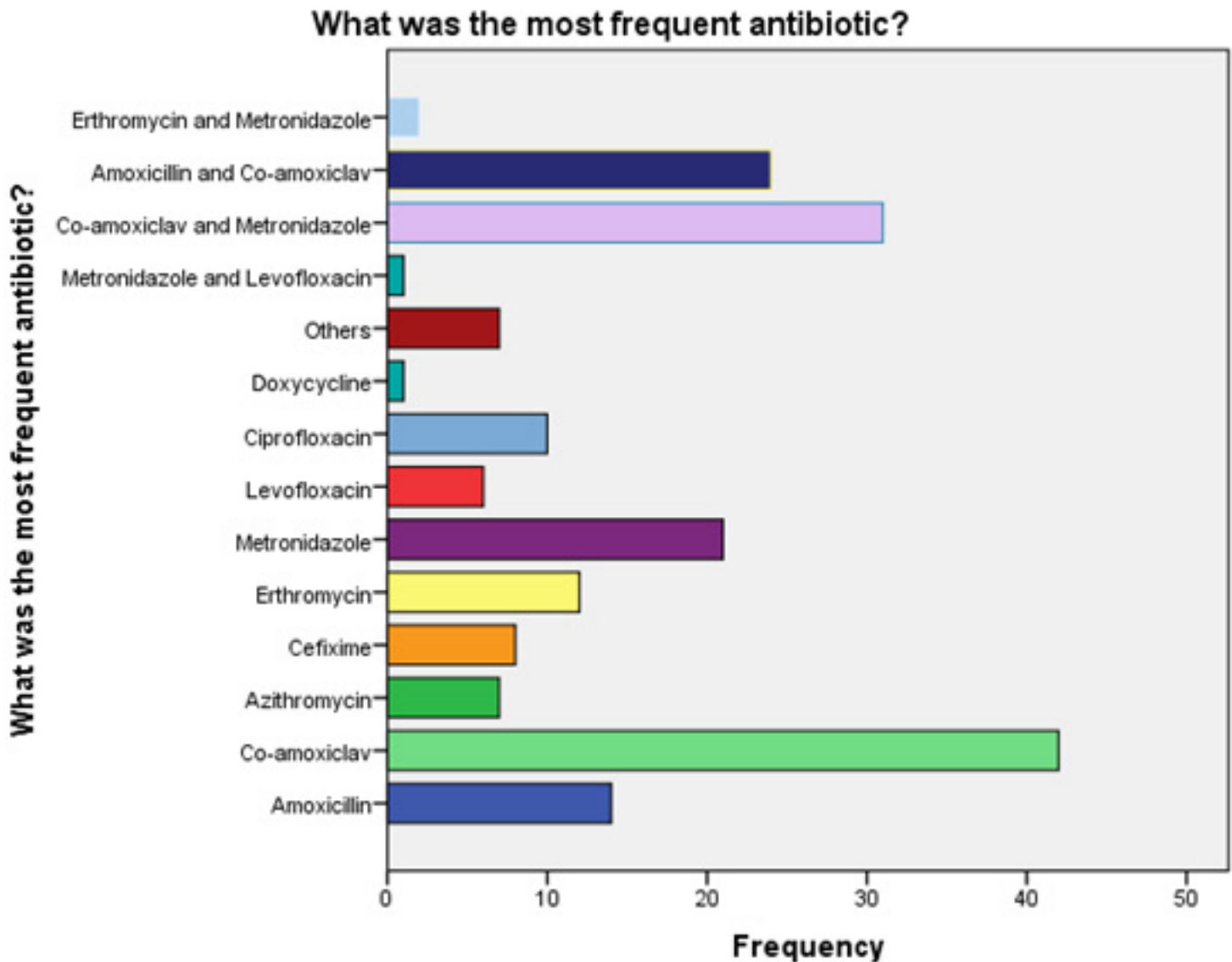


Figure 5 shows that the most frequently used antibiotics were Co-amoxiclav which was used by 11.7%, Metronidazole which was used by 5.8%, Amoxicillin which was used by 3.9%, Erythromycin which was used by 3.1%, Ciprofloxacin which was used by 2.8%, Cefixime which was used by 2.2%, Azithromycin which was used by 1.9%, Others which were used by 1.9%, Levofloxacin which was used by 1.7%, and Doxycycline which was used by 0.3%. Antibiotics in combination used were Co-amoxiclav and Metronidazole which were used by 8.4% and Amoxicillin and Co-amoxiclav which were used by 6.7%, Erythromycin and Metronidazole which were used by 0.6% and Metronidazole and Levofloxacin which were used by 0.3% (p value = 0.004).

Figure 5





## Discussion

The study was carried out to assess the level of self-medication with antibiotics among medical students of Sindh Medical College, Jinnah Sindh Medical University, Karachi.

A previous study was carried out on a sample of 400 students at 4 different universities of Sindh out of which (50%) were medical students. This study reported that (75%) males and (88%) medical students are analogously more aware about the uses of the medicines than females (67%). This study also revealed (39%) of males and (52%) of medical students are familiar with the complications that can arise after the use of medicines compared to the females (38%) (16). Our study showed the percentage of self-medication among students of Sindh Medical College is 52.1%. The percentage of male participants were 25.1% and female participants were 74.9%.

To determine the pattern of self-medication among undergraduate medical students, a study was conducted among 3rd year students at BUMDC (Bahria University Medical and Dental College) in 2013 in which Metronidazole (19%) and Amoxicillin Plus Clavulanic acid (17.3%) were the most commonly used antibiotics (17). According to our study, the most frequently used antibiotics for self-medication were (Co-amoxiclav - 11.7%, Metronidazole - 5.8%, Co-amoxiclav and Metronidazole - 8.4% and Amoxicillin and Co-amoxiclav - 6.7%).

Across-sectional study was conducted about pharmacology education and antibiotic self-medication among medical students at Faculty of Medicine and Allied Sciences in Rajarata University of Sri Lanka, Anuradhapura. The majority of the participants had taken the antibiotic for 1–3 days (68%) (18). According to our study, students used antibiotics for a minimum of; 3-5 days - 69.6%, when infection ends - 10.9%, don't know - 10.3%, 1-2 days - 4.5%, no course - 1.4%, when packet finishes - 0.8%.

A study by Kifayat Ullah on self-medication education with antibiotics among 1st professional medical students in Peshawar, Pakistan revealed that 72.2 % (n=144) of the participants self-medicated with antibiotics out of which 26.3% (n=38) self-medicated just once, while 29.1% (n=42) participants self-medicated with antibiotics more than five times in the last one year. Common causes for self-medication were; diseases not serious enough to consult a doctor (n=84, 58.3%) and past consumption of antibiotics (n=46, 31.9%) and common illnesses for which antibiotics were used; were sore throat (n=120, 83.3%), cough (n=68, 47.2%), fever (n=68, 47.2%) and runny nose (n=58, 40.2%). The choice of antibiotics was determined by previous doctor's prescription (n=100, 69.4%), opinion of others (n=86, 59.7%), self-experience (n=28, 19.4 %) and advertisement (n=6, 4.1%) (19).

Regarding self-medication practice and perceptions among undergraduate medical students; a cross-sectional Study conducted by Shivaraj B Patil et al showed that only (37.1%) of students who took antibiotics completed

the full course of antibiotic regimen. The students should be educated about completing the course of antibiotic (20). However, our study showed that students normally stopped taking antibiotics at the completion of duration of antibiotic course (42.1%) and only 1.9% participants actually stopped taking the antibiotics after they were advised by a doctor so as to not indulge in self medication. According to self-medication practices with antibiotics among Tertiary level students in Accra, Ghana, in a cross-sectional study by Eric S. Donkor et al, 51% (215) of the respondents were aware that self-medication could cause adverse health effects such as antibiotic resistance, 41% (173) of the respondents had little knowledge about this, while 8% (34) of them were not aware at all of any health risk associated with self-medication (20). According to our study 40.4% students reported drug resistance as the most hazardous outcome and 17.3% did not know about it.

According to a report of the National Institute of Islamabad, the first known epidemic of extensively drug-resistant typhoid has been spreading through Pakistan since 2016. This resistance is expected to promulgate globally. Researchers have considered antibiotic resistance an international issue for the modern era to combat epidemics. According to WHO in Karachi, the capital of Sindh province, antibiotic resistance is increasing by 30 percent each year. Eric Mintz, an epidemiologist from CDC says, "It's a global concern at this point" (21).

## Conclusion

This study suggests that students of Sindh Medical College, Jinnah Sindh Medical University, were found to self-medicate with antibiotics. However, knowledge about drug resistance is required at individual level in-order to refrain from doing so. In consideration of these results, adequate measures should be taken to educate students regarding the hazardous side effects of antibiotics.

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