

Research Article

# Prevalence of Self-Medication with Antibiotics Among Bahri University Medical Students, Sudan 2022

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## Abstract

**Background:** Antibiotics are medications that eliminate life threatening infections from the body. It's one of the most reported medications that used without doctor's prescription. The prevalence of self-medication with antibiotics is quite high in developing countries as opposed to developed countries. It is linked with negative outcomes on individual and community health. In addition to its central part in increasing the global problem of antibiotic resistance. In Sudan, despite the overall acceptable level of knowledge regarding antibiotic resistance. Few studies have been carried out to assess prevalence of self-medication. **Objective:** To evaluate the prevalence of self-medication with Antibiotics among fourth- and fifth-year medical students at University of Bahri. **Method:** This is a descriptive cross-sectional study. Conducted among 226 medical students. Selected from fourth- and fifth-year medical students at university of Bahri using google form questionnaire. Then analyzed by using SPSS (statistical package for social science) version 25. **Result:** We found in this study approximately 82.7% of 4th and 5th year medical students at University of Bahri are using antibiotics without prescription. Amoxicillin and azithromycin are the most two common utilized antibiotics without prescription. In addition, we found the main sources of information and knowledge about appropriate dose regarding the self-medication with antibiotics are the academic experience more than (26%) and pharmacist recommendation more than (50.4%). And we found the awareness of the adverse effects of antibiotics without prescription demonstrated by 85.4% of the students. **Conclusion:** The study concludes that prevalence of self-medication with antibiotics among 4th and 5th year medical students at University of Bahri is high, despite of their awareness of adverse effects.

## Keywords

Self-Medication, Antibiotics, Prescription, Antimicrobial Resistance, Sudan

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## 1. Introduction

### 1.1. Background

Antibiotics are medications that eliminate life threatening infections from the body. They are on the top list of the most requested drugs [1]. The use of antibiotics is much higher in African countries where infectious diseases are quite common [2]. Using of medications to overcome one's symptoms without doctor's prescription is known as self-medication. It is always linked to annoying symptoms that are not considered life threatening by the individual to reach a health delivering facility. As a consequence, this may delay the appropriate management. Which will lead to more complications and unfavorable outcomes in addition to the economics burden as many drugs will be used without clinical improvement [3]. Antibiotics are found to be one of the most medications that used by the individuals without medical prescription which had led to emergence of antibiotics resistant bacteria and magnifying the problem of antimicrobial resistance in the community which have been associated with increase mortality worldwide [4, 5]. For the individual this also carrying the risk of medications adverse effects and interactions with other long-term medications [6]. Antimicrobial resistance which is considered as a direct effect of antibiotics miss use. Its worldwide problem that could led to 10 million death every year by 2050 [7, 8].

Self-medication with antibiotics is global phenomena. African countries reported high incidence of self-medication which is facilitated by many factors; availability of the antibiotics which purchased from pharmacies, market stalls, or street vendors and lack of awareness regarding the consequences of self-medications [9-11].

In Sudan, despite the overall acceptable level of knowledge regarding antibiotic resistance [12]. Few studies have been carried out to assess prevalence of self-medication. This study was conducted to evaluate the knowledge of medical student about the danger of self-medication and identify the many reasons that lead to self-medication with antibiotics at Bahri University.

### 1.2. Objectives

General Objective: To evaluate prevalence of self-medication with antibiotics among fourth- and fifth-year medical students at Bahri University.

Specific Objectives:

- 1) To estimate facilitators of self-medication with antibiotics.
- 2) To assess knowledge of self-medication with antibiotics.

## 2. Methods

### 2.1. Study Setting

Through a descriptive, cross-sectional design, the study performed in Bahri University, College of medicine. Targeting fourth- and fifth-year medical students.

### 2.2. Sampling

The sample size calculated using Solving formula:  $sample\ size = n / (1 + n \times e^2)$  found to be 226 participant. Selected through probability simple random sampling. The data collected using Google form questionnaire contain factors measuring the knowledge of self-medication with antibiotics. All the data has been collected and analyzed using statistical package for social science (SPSS) version 25.

### 2.3. Ethical Consideration

Obtained from community department in Bahri University. All students who participated have been informed about the objectives of the questionnaire and verbal consents were taken.

## 3. Results

A total number of 226 participants were recruited. Around half of them 48.7% age between 21- 23. Also 54.9% were female. As illustrated in table 1.

**Table 1.** Sociodemographic characteristics of the participants.

Variable	Frequency	Percent %
Gender		
Male	102	45.1
Female	124	54.9
Age		
18- 20	18	7.5
21- 23	110	48.7
24- 26	98	43.8
Year of college entry		
2015	124	54.9
2016	102	45.1

Data shows that a considerable number of participants using antibiotics without prescription 82.7%. with azithromycin found to be the most overused one 74.8%

**Table 2.** Antibiotics type and triggering complain.

Variable	Frequency	Percent %
Use of antibiotics without prescriptions		
Yes	186	82.7
No	40	17.3
Reason for using antibiotics		
Distrust of doctors	6	2.7
Likely symptoms	5	2.2
Reduce treatment cost	53	23.5
Through your academic experience	123	54.4
I don't use antibiotic without pre- scription	39	17.3
Triggering complains for antibiotic use		
Nasal congestion	90	39.8
Cough	111	49.1
Fever	122	54
Diarrhea	94	41.6
Sore throat	172	76.1
Runny nose	68	30.1
Pain	69	30.5
What antibiotic you are commonly use		
Co-trimoxazole	23	10.2
Amoxicillin	146	64.6
Azithromycin	169	74.8
Metronidazole	103	45.6
Penicillin	37	16.4
Who determine the exact antibiotic for you		
Friend opinion	20	8.8
Old prescription	20	8.8
Parents' opinion	24	10.6
Pharmacist's Recommendation	52	23
Through your academic experience	110	48.7

Majority of the respondent 54.4% stop the antibiotics only after complete the prescribed course.

**Table 3.** Antibiotics durations.

Variable	Frequency	Percent %
follow the instruction that came with antibiotics and understand it		

Variable	Frequency	Percent %
Yes	132	58.8
No	32	14.6
Maybe	62	26.5
How do you know the appropriate dose of antibiotics		
Consult a friend	21	9.3
From Internet	22	9.7
From your academic experience	60	26.5
Parental advice	9	4.0
Pharmacist advice	114	50.4
When did you stop the prescribed antibiotic course		
After complete the prescribed course of antibiotics	123	54.4
Whenever symptoms disappear	73	32.3
After few days of recovery	30	13.3
Did you change the dose of antibiotic during the treatment		
Yes	83	37.6
No	143	62.4

85.4% already knew the side effect of using antibiotics without consulting a doctor.

**Table 4.** Side effects of using antibiotics without prescription.

Variable	Frequency	Percent %
Do you know the side effects of using antibiotic without consulting a doctor		
Yes	194	85.4
No	32	14.6
Did you feel any side effects when you use antibiotic		
Yes	88	38.5
No	138	61.5
Actions you take when feeling of these side effects		
Did not do anything	166	73.5
consulted the doctor	15	6.6
I stopped using the antibiotic	33	14.6
Switched to another antibiotic	12	5.3

## 4. Discussion

The utilization of antibiotics without doctor's prescription is

now becoming a global problem. Existing mainly in developing countries. After data were analyzed 82% of the recruited participant had report self-medication with antibiotics. This high prevalence goes in line with community-based study carried out in Khartoum state found that 81.8% of the population were using antibiotic without prescription [13]. This high reported percent will affect the students and all the society negatively and in long term will accelerate emergence of antibiotic resistant bacteria. Also, this will impact the country economy with negative burden. Wide spread of self-medication with antibiotics could be attributed to cultural perspective of Sudanese people in intending to self-medicate with herbs and traditional therapy. Therefore, this may facilitate and encourage the idea of self-medication with antibiotics. On the other hand, countries like Saudi Arabia and Karachi reported much lower prevalence 34% and 50.1% respectively [14, 15].

Amoxicillin and azithromycin were found to be the most utilized antibiotics. Azithromycin used in treating tonsillitis which is quite common in Sudan that give it the familiarity in resolving sore throat. Which is the main triggering complains behind azithromycin un prescribed utilization as reported from our participants. Similarly, amoxicillin and amoxicillin/potassium clavulanate were the most utilized antibiotics in other study [14]. As in any developing country where people who already facing financial problem trying to keep more money through avoiding meeting doctors, reducing treatment cost was one of the two most common reasons for using antibiotics without prescription along with academic experience. other study reported saving time, previous successful experience and avoid hassle of going to doctor [15]. Similar to other studies we find out that sore throat, fever and cough were the most common triggering factors for self-medication with antibiotics. The respondents reported that pharmacist recommendation and academic experience, 50.4% and 26% respectively. As the main source of information about determining the appropriate antibiotic and the required dose. However, this is considered inappropriate utilization of knowledge as neither pharmacist nor medical students are allowed to prescribe antibiotics as this may danger their lives and lead to unfavorable outcomes. They are also the top reported source of information in other studies [14, 15]. In this study, the main source of “prescription only” and “Over-the-counter” medicines was private sector pharmacy, which seems consistent with local study that targeted Khartoum state population [13]. This emphasizing the need for more regulatory actions from the authorities.

#### *Limitation*

- 1) Poor response of student to fill form questionnaire due to bad internet network in the country.
- 2) The study was limited by a definite time, so no time to increase our sample size.

## 5. Conclusion

The study conclude that majority of the participants utilize

antibiotics without doctor’s prescription which is serious issue need to be amended to avoid the negative impact on health and economy. Amoxicillin and azithromycin were found to be the most utilized antibiotics. With sore throat, fever and cough as the most common triggering factors for self-medication with antibiotics. This study could be the triggering point to raise student and community awareness regarding self-medication with antibiotics.

## 6. Recommendation

We recommend:

- 1) Raise the individual and community awareness regarding the ideal use of antibiotics and the draw backs of self-medication with antibiotics through educational programs.
- 2) Increase awareness of students about risks of self-medication by holding awareness lectures at university.
- 3) Educate students about the importance of consulting a doctor before using antibiotics.
- 4) Warn students of their belief that they are able to treat diseases without consulting a doctor.
- 5) Encouraging students to conduct awareness campaigns about the dangers of self-medication and its impact on human health.

## Abbreviations

SPSS: statistical package for social science

## Author Contributions

**Ayat Abdelmehmoud Ahmed Abdelmehmoud:** Conceptualization, Methodology

**Osama Mohammed Noraldaym Elfaki:** Software, Writing – original draft

**Mustafa Magbol:** Formal analysis

**Musab Fathelrahman Mukhtar Osman:** Resources

**Ahmad Izzoddeen:** Writing—reviewing and editing

**Najla Ahmed Ginawi:** Supervision

## Data Availability Statement

Obtainable from the corresponding author on reasonable request.

## Conflicts of Interest

The authors declare no conflicts of interest.

## References

- [1] World Health Organization. Guidelines for the regulatory assessment of Medicinal Products for use in self-medication. In., vol. WHO/EDM/QSM/00.1. Geneva, Switzerland: WHO; 2000.
- [2] Sannathimmappa, M. B., Nambiar, V., & Aravindakshan, R. (2021). A cross-sectional study to evaluate the knowledge and attitude of medical students concerning antibiotic usage and antimicrobial resistance. *International Journal of Academic Medicine*, 7(2), 113-119. [https://doi.org/10.4103/jehp.jehp\\_557\\_21](https://doi.org/10.4103/jehp.jehp_557_21)
- [3] Alhomoud F, Aljamea Z, Basalelah L. "Antibiotics kill things very quickly"—consumers' perspectives on non-prescribed antibiotic use in Saudi Arabia. *BMC Public Health*. 2018; 18(1): 1177. <https://doi.org/10.1186/s12889-018-6088-z>
- [4] Mousnad Mohamed Awad et al. Assessment of Knowledge and Attitude toward Antibiotic Use and Resistance among Students of International University of Africa, Medical complex, Sudan. 2019. <https://doi.org/10.15761/GDT.1000171>
- [5] Gupta, M. K., Vohra, C., & Raghav, P. (2019). Assessment of knowledge, attitudes, and practices about antibiotic resistance among medical students in India. *Journal of family medicine and primary care*, 8(9), 2864. [https://doi.org/10.4103/jfmpe.jfmpe\\_504\\_19](https://doi.org/10.4103/jfmpe.jfmpe_504_19)
- [6] Zulu, A., Matafwali, S. K., Banda, M., & Mudenda, S. (2020). Assessment of knowledge, attitude and practices on antibiotic resistance among undergraduate medical students in the school of medicine at the University of Zambia. *Int J Basic Clin Pharmacol*, 9(2), 263-270. <https://doi.org/10.18203/2319-2003.ijbcp20200174>
- [7] Marzan, M., Islam, D. Z., Lugova, H., Krishnapillai, A., Haque, M., & Islam, S. (2021). Knowledge, attitudes, and practices of antimicrobial uses and resistance among public university students in Bangladesh. *Infection and drug resistance*, 519-533.
- [8] Piddock LJV. Reflecting on the final report of the O'Neill review on antimicrobial resistance. *Lancet Infect Dis*. 2016; 16(7): 767–768. [https://doi.org/10.1016/S1473-3099\(16\)30127-X](https://doi.org/10.1016/S1473-3099(16)30127-X)
- [9] Bin Nafisah S, Bin Nafesa S, Alamery AH, et al. Over-the-counter antibiotics in Saudi Arabia, an urgent call for policy makers. *J Infect Public Health*. 2017; 10(5): 522–526. <https://doi.org/10.1016/j.jiph.2016.09.016>
- [10] Al-Azzam SI, Al-Husein BA, Alzoubi F, et al. Self-medication with antibiotics in Jordanian population. *Int J Occup Med Environ Health*. 2007; 20(4): 373–380. <https://doi.org/10.2478/v10001-007-0038-9>
- [11] Radyowijati A, Haak H. Improving antibiotic use in low-income countries: an overview of evidence on determinants. *Soc Sci Med*. 2003; 57: 733–744. [https://doi.org/10.1016/S0277-9536\(02\)00422-7](https://doi.org/10.1016/S0277-9536(02)00422-7)
- [12] Magbol, M., Osman, M. F. M., Ahmed, M. A. A. M., Alneama, M. A. B., Hassieb, M. A. A. (2024). Assessment of Knowledge, Attitude and Practice of Antibiotic Resistance among Medical Student at Al-Zaiem Al-Azhari University, December 2021 – July 2022. *Int Internal Med J*, 2(1), 01-06.
- [13] Awad A, Eltayeb I, Capps P. Self-medication practices in Khartoum State, Sudan. *European Journal of Clinical Pharmacology*. 2006; 62(4): 317-324. <https://doi.org/10.1007/s00228-006-0107-1>
- [14] Alghadeer S, Aljuaydi K, Babelghaith S, Alhammad A, Alarifi M. Self-medication with antibiotics in Saudi Arabia. *Saudi Pharmaceutical Journal*. 2018; 26(5): 719-724. <https://doi.org/10.1016/j.jsps.2018.02.018>
- [15] Shah S, Ahmad H, Rehan R, Najeeb S, Mumtaz M, Jilani M et al. Self-medication with antibiotics among non-medical university students of Karachi: a cross-sectional study. *BMC Pharmacology and Toxicology*. 2014; 15. <https://doi.org/10.1186/2050-6511-15-74>