

## Original Research Article

# Comparative assessment of antibiotic self-medication practices among under-graduate medical students and general population

Shakeel Ahmad Mir<sup>1\*</sup>, Junaid Ahangar<sup>1</sup>, Danish Shakeel<sup>2</sup>

<sup>1</sup>Department of Clinical Pharmacology, Sher-I-Kashmir Institute of Medical Sciences (SKIMS) <sup>2</sup>Srinagar, Kashmir, India

<sup>2</sup>Student, CSE(Hons)-IBM (Information Security), University Institute of Engineering, Chandigarh University, Mohali, Punjab, India

**Received:** 04 October 2019

**Revised:** 16 October 2019

**Accepted:** 04 November 2019

### \*Correspondence:

Dr. Shakeel Ahmad Mir,

E-mail: drshakeelahmadmir@gmail.com

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** Self-medication with antibiotics is a global problem and increases the risk of antibiotic resistance which impacts morbidity and mortality.

**Methods:** A total of 180 Medical students and the same number of people from general population were given a pre-validated questionnaire. The total respondents were 168 among general population and 173 among medical students.

**Results:** 21.42% respondents from general population and 82.08% medical students practiced antibiotic self-medication. 66.66% respondents from general population practiced antibiotic self-medication to save time and money. 57.04% medical students had previous experience of treating similar symptoms. 83.33% respondents from general population and 89.43% medical students used antibiotics to treat fever, cough, cold, sore throat and similar symptoms. 50.00% respondents from general population consulted the chemist/pharmacist before using the antibiotics. 38.02% students consulted their textbooks for drug information. Only 16.66% respondents from general population and 24.64% students continued the antibiotics till full recovery.

**Conclusions:** Antibiotic self-medication is more prevalent among medical students as compared to general population. Medical students need to be targeted repeatedly during their education and be taught the value of using antibiotics with caution. Public awareness and strict enforcement of law to control the sale of antibiotics without a valid prescription are needed to minimize antibiotic self-medication and associated risks.

**Keywords:** Antibiotics, General population, Medical students, Self-medication

## INTRODUCTION

Self-medication involves use of medicinal products by the individuals to treat self-recognized diseases or symptoms or the intermittent or continuous use of medication prescribed by a physician for chronic or recurrent disease or symptoms.<sup>1</sup> Self-medication also involves acquiring medicines without a prescription or resubmitting old prescriptions to purchase medicines,

sharing medicines with relatives or members of one's social circle or using left over medication or failing to comply with the professional prescription, either by prolonging it or interrupting it too early or decreasing or increasing the originally prescribed dose.<sup>2</sup>

Self-medication is widely practiced in both the developed as well as developing countries.<sup>3</sup> The advancement in information and communication has lead to easy access

to the knowledge about medicines. Easy access to drugs, influence of advertisements and previous experience of treating similar illness have influenced the practice of self-medication.<sup>4</sup> Though Self-medication reduces the burden of governments due to health expenditure linked to the treatment of minor health conditions, yet it is far from being a completely safe practice.<sup>5</sup> Self-medication with antibiotics leads to increased risk of antibiotic resistance. Various studies suggest that there is a considerable use of antibiotics without consulting a physician obtained directly from pharmacy or from left over antibiotics.<sup>6</sup>

Medical students differ from the general population in that they are exposed to knowledge about diseases and drugs and hence are the most vulnerable individuals for self-medication.<sup>3</sup> While responsible self-medication can be used to prevent and treat symptoms and ailments that do not need medical consultation, self-medication with antibiotics without sufficient knowledge may lead to antibiotic resistance which increases morbidity and mortality.

## METHODS

The Study Design is descriptive cross-sectional questionnaire based study was conducted in a time span of six months from January 2019 to June 2019.

The study population consisted of undergraduate medical students of a Government Medical College and the people from general population attending different pharmacies to purchase drugs without a valid prescription. A total of 180 Medical students and the same number from general population were given a pre-validated questionnaire. 168 from general population and 173 medical students returned the completely filled questionnaire giving the response rate of 93.33% and 96.11% respectively.

The Study tools a structured questionnaire in Kashmiri, Urdu and English languages was created by reviewing relevant literature and questionnaires used previously in similar studies. The first part of the questionnaire investigated socio-demographic characteristics of the study subjects, such as age, gender, marital status, level of education, and class/grade.

In the second part, attitude and behaviors about antibiotic usage were assessed. The questionnaire was pre-tested for content and design on 10 subjects from each group to clarify any ambiguities and suitable modifications were done. The Sampling method is Simple random sampling.

### Consents

The participants were informed about study objectives before data collection, and then their consents were sought and questionnaires were filled only by those who were willing to fill it.

### Inclusion criteria

- Of sound mind
- Can communicate by at least one of the means viz. speaking or writing
- Consuming antibiotics without any valid prescription at time of study or having consumed within past one year

### Exclusion Criteria

- Of insane mind
- Unable to communicate
- Drug consumers, taking antibiotics with a valid prescription

### Ethical considerations

The study was approved by the Institutional Ethics Committee. The anonymity of the participants was maintained, and ethical principles followed. Before the distribution of questionnaires, the background and intentions of the survey were explained, and the participants were encouraged to participate without any undue pressure.

Returning of the completed survey questionnaire by the participants was accepted as consent. Participation was voluntary, anonymous and without compensation.

### Data analysis

The analysis was done by combination of manual calculators, Vassar Stats, and SPSS v20. Results were expressed in frequencies and percentages. The questionnaires which were incompletely filled were excluded from the study. Some of the questions had multiple options to choose from; therefore, the sum total of percentages is not always 100%.

## RESULTS

The total respondents were 168 among general population and 173 among medical students. In general population, 60.11% (n=101) were males and 39.89% (n=67) were females. Among medical students 47.97% (n=83) were males and 52.02% (n=90) were females.

Among 54.76% (n=92) respondents from general population were unmarried. 100.00% students (n=173) were unmarried. 21.42% (n=36) respondents from general population admitted practicing self-medication with antibiotics where as 82.08% (n=142) medical students practiced antibiotic self-medication. (Table 1) 36.11% (n=13) respondents from general population and 21.83% (n=31) medical students practiced self-medication to save time. 30.55% (n=11) respondents from general population practiced it to save money. 27.77% (n=10) respondents from general population and 57.04% (n=81) medical students had previous experience

of treating similar symptoms or re-submitted a previous prescription to get antibiotics. 2.77% (n=1) respondents from general population and 21.12% (n=30) students thought that the illness was minor. 2.77% (n=1) respondents from general population used antibiotics to avoid hassles of going to the doctor. (Table 2) 83.33% (n=30) respondents from general population and 89.43% (n=127) medical students used antibiotics to treat fever, cough, cold, sore throat and similar symptoms. 25.00% (n=9) respondents from general population and 5.63% (n=8) students used to treat diarrhea and similar other GI symptoms. 8.44% (n=12) students used antibiotics to treat acne and other skin and soft tissue infections. 2.77% (n=1) respondents from general population and 7.04% (n=10) students used antibiotics to treat urinary symptoms. 5.55% (n=2) respondents from general population and 5.63% (n=8) students used antibiotics for orodental problems (Table 3).

Among 13.88% (n=5) respondents from general population and 11.97% (n=17) students searched the internet to find out related drug information. 50.00% (n=18) respondents from general population consulted the chemist/pharmacist before using the antibiotic. 22.22% (n=8) respondents from general population and 23.23% (n=33) students made a guess about the antibiotic to be used. 16.66% (n=6) respondents from general population and 12.67% (n=18) students consulted their friends or family. 2.77% (n=1) respondents from general population and 11.26% (n=16) students read the package insert for directions. 2.77% (n=1) respondents from general population and 7.04% (n=10) students used the drug under the influence electronic media advertisement.

Among 38.02% (n=54) students consulted their textbooks for drug and its dosage. (Table 4) 52.77% (n=19) respondents from general population and 55.63% (n=79) students stopped the antibiotic after disappearance of symptoms. 27.77% (n=10) respondents from general population and 11.26% (n=16) students stopped the antibiotic irrespective of outcome. 16.66% (n=6) respondents from general population and 24.64% (n=35) students continued the antibiotic till full recovery (Table 5).

**Table 1: Demographics of study population.**

Category	General population No. (%)	Medical students No. (%)
Total Respondents	168	173
Males	101 (60.11)	83 (47.97)
Females	67 (39.89)	90 (52.02)
Age 18-25 years	34 (20.23)	173 (100.00)
Literate	134 (79.76)	173 (100.00)
Married	76 (45.23)	-
Un married	92 (54.76)	173 (100.00)
Self-medicators	36 (21.42)	142 (82.08)
Non-self medicators	132 (78.57)	31 (17.91)

**Table 2: Reasons for antibiotic self-medication.**

Reason	Gen. population no. (%)	Medical students no. (%)
Saves time	13(36.11)	31(21.83)
Saves money	11(30.55)	-
Previous experience	10(27.77)	81(57.04)
Minor illness	1(2.77)	30(21.12)
Avoids hassles	1(2.77)	-

**Table 3: Diseases /symptoms treated by antibiotic self-medication.**

Diseases treated	Gen. population no. (%)	Medical students no. (%)
Fever, cough, cold, sore throat	30 (83.33)	127 (89.43)
Diarrhea	9 (25.00)	8 (5.63)
Skin infections	-	7 (4.92)
Acne	-	05 (3.52)
UTI	1 (2.77)	10 (7.04)
Orodental	2 (5.55)	8 (5.63)

**Table 4: source of information.**

Source	Gen. Population No. (%)	Medical Students No. (%)
Internet	5(13.88)	17(11.97)
Chemist/pharmacist	18 (50.00)	-
Self-guess	8(22.22)	33(23.23)
Family/friends	6(16.66)	18(12.67)
Package insert	1(2.77)	16(11.26)
Radio/tv ad	1(2.77)	10(7.04)
Textbooks	-	54(38.02)

NB: due to multiple options respondents could select, sum of % age is not always 100.

**Table 5: Mode of terminating antibiotic self-medication course.**

Mode of termination	Gen. population No. (%)	Med. students No. (5)
After symptoms disappear	19 (52.77)	79 (55.63)
After few days (despite nature of outcome)	10 (27.77)	16 (11.26)
After complete recovery	6 (16.66)	35 (24.64)
Prolonged use	1 (2.77)	12 (8.45)

**DISCUSSION**

The present study found higher prevalence of antibiotic self-medication among medical students (82.08%). They have easy access to the antibiotics through physician

samples and “The White Coat” guarantees trouble free access to drugs available in pharmacies.

In India, antibiotic self-medication prevalence among medical students observed in different studies is 57% in Central India and 15.33% in South India.<sup>7,8</sup> Prevalence observed among medical students in some other countries is: 30.60% Saudi Arabia<sup>9</sup>, 38.9% Serbia<sup>10</sup>, 36% Pakistan.<sup>11</sup> In this study antibiotic self-medication prevalence found in general population was 21.42%. The prevalence among general population in some countries is: China 59.5%, Yemen 60%, Greece 74.6%, Iran 53.00%, Sudan 48.1%, Jordan 40.7%, Lithuania 22% and Turkey 19.1%.<sup>12</sup>

In this study the common reasons for self-medication in general population were that it saves time (36.11%) and money (30.55%). But in medical students the common reasons were they had previous experience of treating similar ailment (57.04%) and the disease was minor (21.12%). It shows that medical students self-medicate with antibiotics mostly because they have easy access to information from drug indices, literature, and other medical students to self-diagnose and self-medicate. Sonia et al, in a study conducted in Sargodha Pakistan found high consultation cost (75%), minor illness (93%), having experience with same medicine previously (70%), time shortage (59%), as main reasons for self-medication.<sup>13</sup>

In a study conducted in urban areas of Peshawar Pakistan, high cost of health care was mentioned the main reason for self-medication by majority (88%).<sup>14</sup>

In another study conducted in rural areas of Barbanki, India most common reasons for self-medication were time saving (45.2%) followed by high cost of consultation (42.3%), minor illness (39.9%) followed by convenience (25.0%).<sup>15</sup>

The present study reveals that in general population 83.33% used antibiotics to treat fever, cough, cold, sore throat and similar other symptoms. 89.43% medical students used the antibiotics for similar symptoms. The second common illness treated by antibiotic self-medication was diarrhea in general population (25.00%) and UTI by medical students (7.04%). In a comparative study conducted in Mumbai India among medical students, the common ailments for which self-medication was used were fever (89%), common cold (84%) and headache (83%).<sup>16</sup>

In the present study the major source of information about the drugs was pharmacist for the general population (50.00%) and textbooks for the medical students (38.02%). In another study conducted in Nagpur, India, it was found that majority of students (79.1%) read package inserts and labels and followed the instructions written on them.<sup>17</sup> In another study on medical students conducted in Saudi Arabia, it was found that course textbooks and

learning experience was the most important source of drug information among medical students (58.0%).<sup>9</sup>

The present study shows 52.77% respondents from general population and 55.63% medical students discontinued the antibiotics on the disappearance of the symptoms and only 16.66% respondents from general population and 24.64% medical students continued the antibiotic till full recovery. In a study conducted in Ghana, 51% university students continued antibiotics till full recovery.<sup>18</sup>

Summarizing the observations of the present study it was found that antibiotic self-medication is more common in medical students as compared to general population. But the majority in both the groups stop the antibiotics as soon as the symptoms disappear. Pharmacists in general population and textbooks in medical students are the major source of drug information. Fever and respiratory symptoms are the major diseases for which antibiotics were used in both the groups almost equally. Though the antibiotic self-medication is more prevalent in medical students, but the pattern of usage in medical students was found almost similar to general population which is contrary to the expectations as medical students have a better knowledge of consequences of antibiotic misuse and are expected to use the drugs more rationally.

One limitation of this study is recall bias. We tried to minimize it by using a well-structured pre-validated questionnaire. Another limitation is the limited sample size, which we tried to overcome by use of a random sampling method so as to generalize the findings. The present study is a single institution study, and exploratory in nature. It adds to our understating of antibiotic self-medication patterns in different population groups. It provides a basis for future multi-center confirmatory studies with large sample size.

## CONCLUSION

Antibiotic self-medication is a global public health problem and enhances the development of antibiotic resistance. The high prevalence of antibiotic self-medication among medical students compared to general population is a matter of great concern. They will be this future drug prescribers and health care educators. They need to be targeted repeatedly during their education and be taught the value of using antibiotics with caution. Community pharmacists could play a crucial role in controlling the irrational antibiotic use by general population. Public awareness and strict enforcement of law to control the sale of antibiotics without a valid prescription are needed to minimize antibiotic self-medication and associated risks.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*



## REFERENCES

1. WHO. World Health Organization; Geneva. The role of pharmacist in self-care and self-medication. Report of the fourth WHO consultative group on the role of pharmacist. Available at: <https://apps.who.int/medicinedocs/pdf/whozip32e/w/hozip32e.pdf>.
2. Loyola Filho AI, Lima-Costa MF, Uchôa E. Bambuí Project: a qualitative approach to self-medication. *Cadernos de saude Publica.* 2004;20:1661-9.
3. Gupta M, kasulkar AA. Pattern of self-medication among dental students in private institute. *Intern J Recent Tren Sci Technol.* 2015;16(3):603-5.
4. Girish HO, Divya HM, Prabhakaran S, Venugopalan PP, Koppad R, Acharya A. A cross-sectional study on self-medication pattern among medical students at Kannur, North Kerala. *J Evol Med Dent Sci.* 2013;2:8693-700.
5. Shakeel AM, Shakil UR. Prevalence and pattern of self-medication practices in rural areas of Central Kashmir. *Int J Pharm.* 2015;5(4):1255-60.
6. Tesaf T, Foltan V, Langsdl L, Binder R. Consumption of antibiotics and self-medication within the Slovak Republic. *Acta Fac Pharm Univ Comen.* 2005;52:210-7.
7. Sankdia RK, Agrawal M, Rekha PB, Kothari N. A Questionnaire Based Study Regarding the Knowledge, Attitude and Practice of Self-Medication Among Second Year Undergraduate Medical Students. *Intern J Pharmacol.* 2017;6(1):1-5.
8. Stephen S, Sukanya M, Thanu S, Treessa TS, Shettigar D. Self-medication practices among undergraduate nursing students in south India: a cross sectional study. *Am Int J Res Sci Tech Engineer Mathemat.* 2013;3(2):159-62.
9. Aljaouni ME, Alalawi HH, Hafiz AA, Alahmadi GM, Khawaja IM. *International Journal of Academic Scientific Research.* 2015;4(3):54-65.
10. Lukovic JA, Miletic V, Pekmezovic T, Trajkovic G, Ratkovic N, Aleksic D et al. Self-medication practices and risk factors for self-medication among medical students in Belgrade, Serbia. *PloS One.* 2014;9(12):114644.
11. Assad T, Karim N, Younus I, Feroz Z. Self-medication Patterns among Undergraduate Medical Students: A Cross Sectional Institution Based Study. *Pharmacol, Toxicol Biomed Rep.* 2017;3(2):43-6.
12. Heidarifar R, Koohbor M, Kazemian MM, Mikaili P, Sarahroodi S. Self medication with Antibiotics among Iranian Population in Qom State. *J Scienti Innovat Res.* 2013;2(4):785-9.
13. Imtiaz S, Salam NA, Kamran. Conditions, frequencies, and sociodemographic factors leading self medication practice in Sargodha area of Punjab Pakistan. *J App Pharm.* 2013;5(4): 819-26.
14. Khan SJ, Amanullah KS, Shah N. Self-medication with antibiotics in urban areas of Peshawar. *Gomal J Med Sci.* 2011;9(1):1-4.
15. Keshari SS, Kesarwani P, Mishra M. Prevalence and pattern of self-medication practices in rural area of Barabanki. *Ind J Clin Pract.* 2014;25(7):636-9.
16. Divya S, Katlam S, Mohanty IR, Jindal JD, Deshmukh YA. Comparative assessment of self-medication practices among under-graduate medical and engineering students. *J Commun Healt Managem.* 2014;1(1):23-9.
17. Kasulkar AA, Gupta M. Self-medication practices among medical students of a private institute. *Ind J Pharmaceut Sci.* 2015;77(2):178.
18. Donkor E, Tetteh-Quarcoop P, Nartey P, Agyeman I. Self-medication practices with antibiotics among tertiary level students in Accra, Ghana: a cross-sectional study. *Intern J Environ Res Pub Health.* 2012;9(10):3519-29.

**Cite this article as:** Mir SA, Ahangar J, Shakeel D. Comparative assessment of antibiotic self-medication practices among under-graduate medical students and general population. *Int J Res Med Sci* 2019;7:4563-7.