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Research Article

**TO STUDY THE EFFECT OF ANTIBIOTICS USED AS SELF
MEDICATED DRUG IN THE COMMUNITY**Akhil P Shaji¹, Akhila R Nair¹, Alin Mariya Alex¹, Apoorva Dev^{*2}¹Pharm D Interns, Department of Pharmacy Practice, PES College of Pharmacy,
Bengaluru, Karnataka, India-560 050.²Assistant Professor, Department of Pharmacy Practice, PES College of Pharmacy,
Bengaluru, Karnataka, India-560 050.**Article Received:** October 2020 **Accepted:** November 2020 **Published:** December 2020**Abstract:**

Back ground: Self-medication is the use of medication by individuals without the prescription of any health care professionals to treat self-recognized illness and symptoms. Self-medication with antibiotics is a major factor contributing to the development of bacterial antibiotic resistance.

Objectives: The objectives of the study are to estimate the prevalence of self-medication of antibiotics and the reasons for self-medication.

Methodology: This is a prospective community-based study carried out for a time period of 6 months. The study included 578 participants from different areas of Bangalore, Karnataka and the data were collected with a structured questionnaire.

Results: Out of 578 samples obtained the prevalence of self-medication of antibiotics is high in males (50.95%) when compared to females (49.05%). The age group between 15-25 showed higher use of self-medicated antibiotics (86.16%). Amoxicillin (42.88%) was the most commonly used antibiotic and the most common disease for which antibiotic was taken is fever (37.31%). Out of 578 participants, 190 had taken antibiotics for 3 days (32.87%). Source of information for the use of antibiotics were pharmacy (46.99%), family/friend (28.22%) and internet (16.44). Nausea/vomiting was observed to be the commonly experienced side effect (48.41%).

Conclusion: Our study gives an overview of the effect on self-medication of antibiotics. The level of self-medicating antibiotics is relatively high among participants. Health education on appropriate use of antibiotics is necessary.

Keywords: Self-medication, antibiotics, nausea/vomiting, antibiotic resistance, amoxicillin.

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INTRODUCTION:

Over the counter (OTC) drugs are medications available without a prescription by a physician. It is used to treat many illnesses such as pain, fever, diarrhoea, cough, cold and allergies. There are branded and generic versions of the drug. Other than pharmacies OTC medications are also available in stores and supermarkets. OTC medications can cause serious side effects as they may interact with the prescription drugs and cause harm. For example, Warfarin, a blood thinning agent can cause high risk for bleeding if they are taken with OTC Ibuprofen. Most commonly used OTC medications are Acetaminophen, NSAIDs like Naproxen, Aspirin etc.

Infections have been a challenge throughout the ages. From 1347 to 1350, about one-third of Europe's population disappeared to Bubonic plague. Improvements in sanitary and hygienic conditions were sufficient to control further plague outbreaks. However, these were not enough. Likewise, infectious diseases remained the leading cause of death up to the early 1900s, However, by the mid-1900s, the mortality of infectious diseases in England shrunk to less than 1% after the sale of antibiotics, was regarded as a 'medical miracle'.

Antibiotics were truly miracle drugs, curing previously fatal infections. Resistance to new antibiotic developed, usually within a few years after the antibiotic entered the market. Resistance is unavoidable with any new agent developed. Antibiotic resistance cannot be completely prevented because many organisms carry intrinsic resistance mechanisms, which render certain antibiotics useless even with appropriate use of antimicrobial agents to treat or prevent serious infection, emergence of subpopulations of resistant strains are inevitable. By doing this, we can slow down the resistance development. Nevertheless, proper knowledge of the factors associated with the development of resistance is needed to maximize the therapeutic efficacy of antimicrobial therapy. Different antibiotics have variant modes of action, due to their structure and degree of affinity to certain target sites.

The antibiotic resistance (ABR) has been related with the abuse of medicines, along with scarcity of latest drug development by the pharmaceutical company due to diminished economic incentives. The Centres for Disease Control and Prevention (CDC) has classified a number of bacteria as serious and causing threats, many of which are already responsible for placing a substantial clinical and financial burden on the U.S. health care system, patients, and their families. Unified efforts to execute new policies and

pursue steps to control the disaster are greatly needed.

Aim:

To study the effect of antibiotics used as a non-prescribed drug in the community.

Objectives:

- To determine the most commonly used antibiotics without prescription.
- To estimate the prevalence of self-medication of antibiotics.
- To assess the reason for self-medication of antibiotics.

MATERIALS AND METHODS:**Study site:**

The study was conducted at community pharmacies in and around of Hanumanth nagar, Bengaluru, Karnataka, India.

Study period:

The study was carried out for a period of six months.

Study design:

A prospective and community-based study.

Study criteria:**Inclusion criteria**

- Participants of 15 to 55 years of age.
- Participants who are taking antibiotics as self-medicated drug.

Exclusion criteria

- Participants who are on antibiotics with prescription.
- Participants who are not willing to give the consent.
- Pregnant, lactating, pediatric and geriatric population.

Source of data:

Well-structured data collection form was designed to collect information on basic demographic data, indication for using the antibiotics, most commonly used antibiotics, duration, frequency and if any side effects experienced.

Sample size:

Estimated sample size calculation was 800, out of which 578 samples were taken for analysis.

Study procedure:

- ✓ A prospective, community-based study was carried out in 578 participants. Consent was taken to enrol into the study after explaining them about the study.

- ✓ Using the help of community pharmacies in and around the study site, customers visiting the pharmacies were approached to get information about the usage of antibiotics without prescription.
- ✓ Voluntary consent of the customers was obtained after detailing of purpose of the study.
- ✓ Well-structured questionnaire was used for collecting information from the customers.

- ✓ Counselling was done to improve their knowledge on the use of antibiotics without prescription.

Result analysis:

The data collected were analyzed using Microsoft Excel.

RESULTS:

A prospective, observational study was conducted over a period of 6 months. 578 samples were obtained.

Table 1: Gender distribution

Gender	No. of participants	Percentage (%)
Female	283	49.05
Male	295	50.95
Total	578	100

Table 1 depicts gender distribution. It shows that, out of 578 participants males (50.95%) were more in number than females (49.05%).

Table 2: Age distribution

Age	No. of participants	Percentage
15-25	498	86.16%
26-35	80	13.84%
Total	578	100%

Table 2 depicting age shows that 15-25 years are more prone to self-medicate with antibiotics than other age groups.

Table 3: Education

Education	No. of participants	Percentage (%)
Higher secondary	30	5.24
Under graduate	364	63.53
Post graduate	179	31.24
Total	573	100

Table 3 depicting education shows that undergraduates are more prone to self-medicate with antibiotics.

Table 4: Taking antibiotics without prescription is right or not

Taking antibiotics without prescription is right	No. of participants	Percentage (%)
True	79	13.52
False	499	86.48
Total	578	100

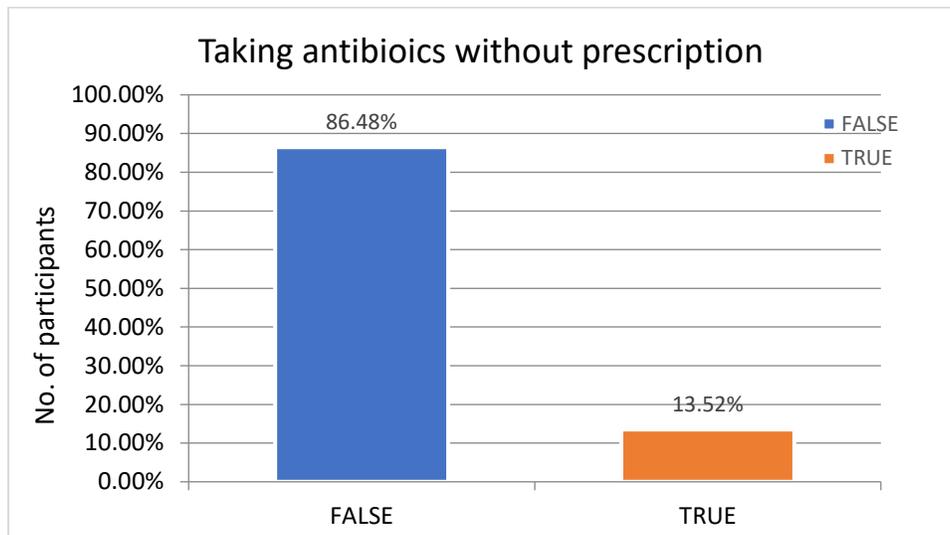


Figure 1: Taking antibiotics without prescription is right or not

Figure 1 and Table 4 depicting statement whether antibiotic usage without prescription is right, shows that 86.48% of participants have said that taking antibiotics without prescription is false.

Table 5: Most commonly used antibiotics without prescription

Antibiotics	No. of frequency	Percentage
Amoxicillin	328	42.88%
Azithromycin	148	19.35%
Ciprofloxacin	63	8.24%
Clindamycin	48	6.27%
Others	178	23.27%
Total	765	100%

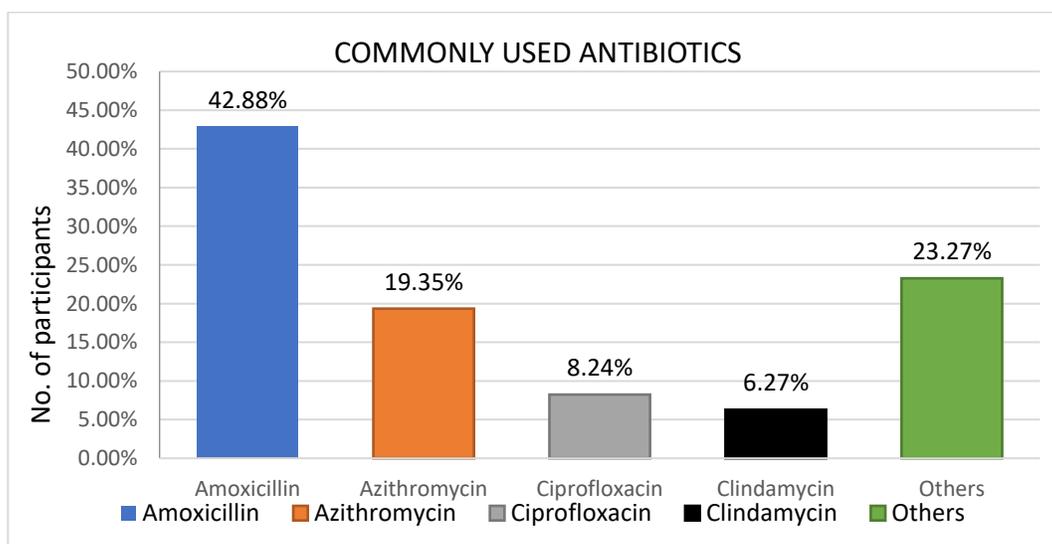


Figure 2: Most commonly used antibiotics without prescription

From Table 5 and Figure 2 depicts most commonly used antibiotic is amoxicillin (42.88%) and the least used is clindamycin (6.27%).

Table 6: Represents the common disease conditions for which individuals take antibiotics

Symptoms	Frequency	Percentage
Fever	369	37.31%
Infections (ear, eyes, throat)	184	18.60%
Sore throat	141	14.26%
Urinary tract infections	104	10.52%
Diarrhoea	49	4.95%
Tooth ache	43	4.35%
Acne	31	3.13%
Others	68	6.88%
Total	989	100%

Table 6 depicts that most common symptoms for which antibiotics are taken is fever (37.31%) and the least one was found to be acne (3.13%).

Table 7: Number of days drug was taken

Number of Days	Frequency	Percentage
<3 Days	178	30.80%
3 Days	190	32.87%
5 Days	173	29.93%
>5 Days	37	6.40%
Total	578	100%

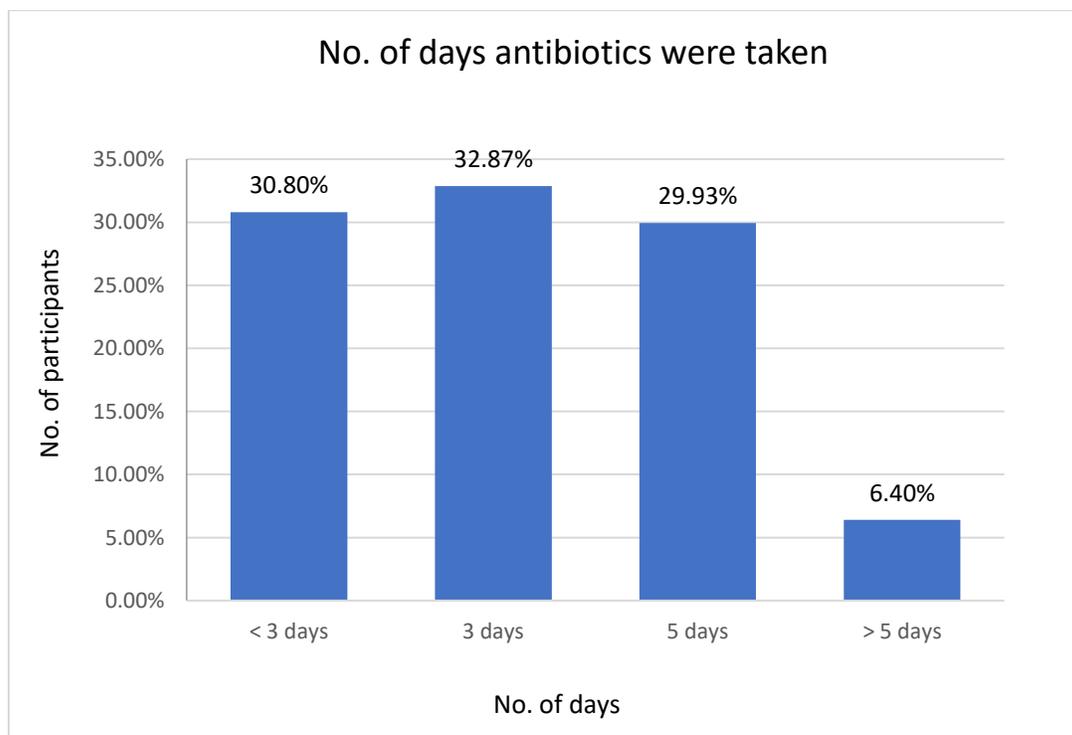


Figure 3: Number of days the antibiotic was taken

Table 7 and Figure 3 depicts that most people took antibiotics for 3 days (32.87%) and the least was >5days (6.40%).

Table 8: Source of information regarding the medicine you take other than physician

Source of information	Frequency	Percentage
Pharmacist	343	46.99%
Family/friend	206	28.22%
Internet	120	16.44%
Advertisements	25	3.42%
Physician	19	2.60%
Leaflets	17	2.33%

Table 8 depicts that most people depend on pharmacist (46.99%) for their drug information and the least depended sources are leaflets (2.33%).

Table 9: Source of antibiotic supply

Source	Frequency	Percentage
Pharmacy	545	94.29%
Friends/family	26	4.50%
Others	7	1.21%

Table 9 depicts that most people depend on pharmacy (94.29%) for their medicines than other sources.

Table 10: Reasons for self-medication

Reasons for self-medication	Frequency	Percentage
Previous experience of taking the medication	399	69.03%
To save time	107	18.51%
Hospital visits are too expensive	72	12.46%

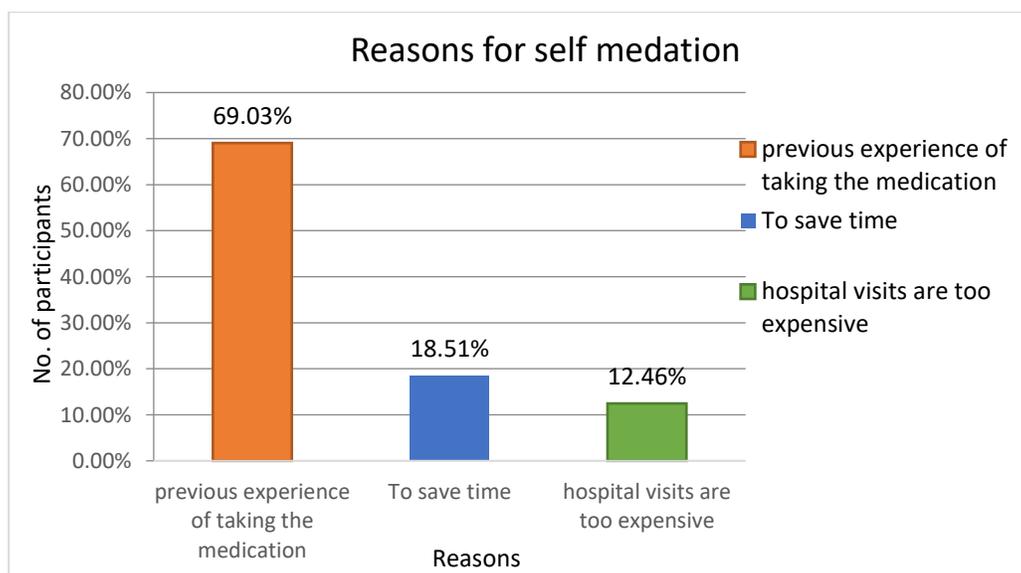


Figure 4: Reasons for self-medication

Table 10 and Figure 4 depicts that most people self-medicate due to previous experience of taking the medication.

Table 11: Patients health condition

Has patient's health condition improved	Frequency	Percentage
Yes	423	73.69%
No	12	2.26%
Somewhat	138	24.06%

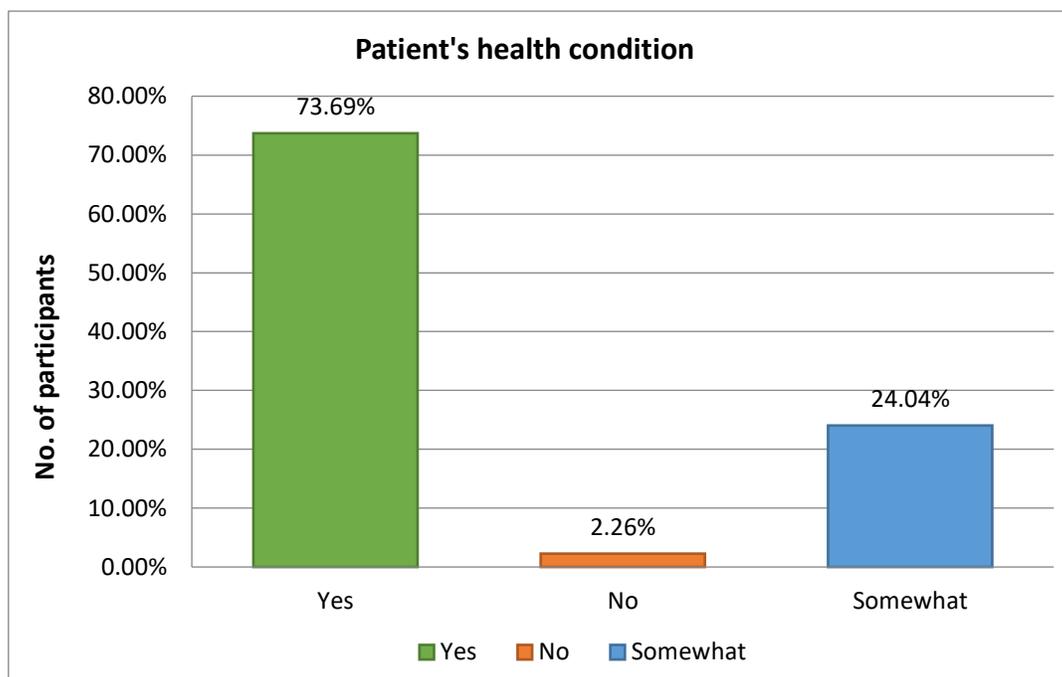


Figure 5: Patients health condition has improved or not

From Table 11 and Figure 5, it is depicted that patient's health condition has improved (73.69%) by taking the medicines.

Table 12: Side effects of taking antibiotics

Side effects	Frequency	Percentage
Nausea/Vomiting	305	48.41%
Weakness	183	29.05%
Indigestion	49	7.78%
Abdominal pain	34	5.40%
Rashes/itching	32	5.08%
None	27	4.29%

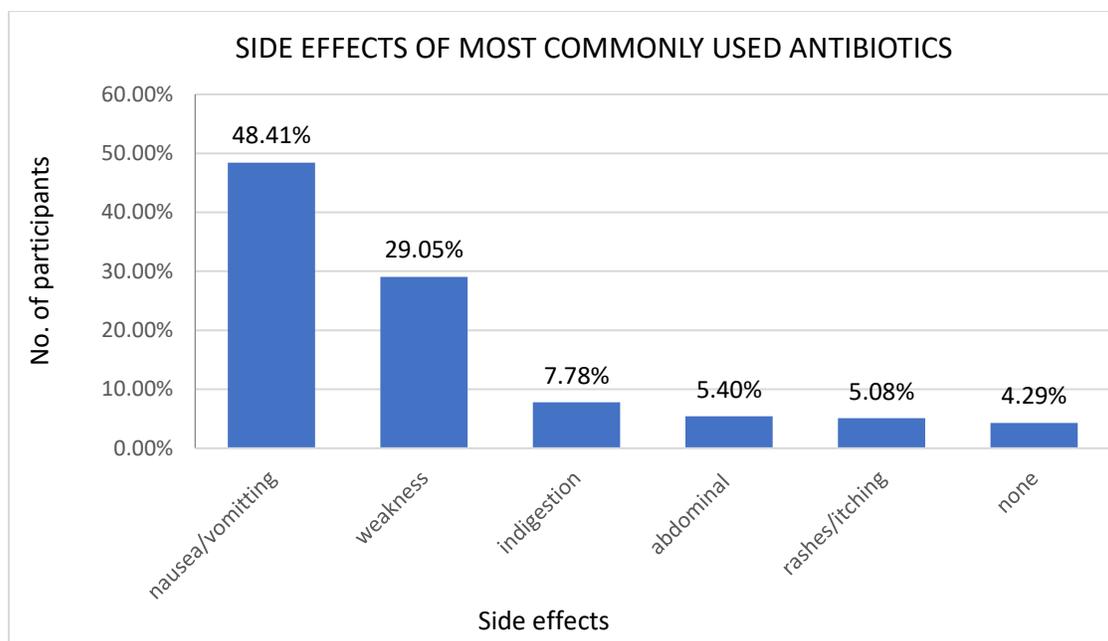


Figure 6: Side-effects of using antibiotics

From Table 12 and Figure 6 it is observed that people who experienced nausea/vomiting (48.41%) are more than others.

DISCUSSION:

Self-medication is the usage of medicines by people on their own without any trained medical supervision. In India, most cases are treated by self-medication due to easy accessibility of non-prescription drugs. It is a prominent restriction in ensuring the safe and effective use of medicines. It is inappropriate without complete knowledge although it is becoming a routine practice nowadays.

Self-medication with antibiotics leads to adverse drug reactions, drug interactions, masking the correct diagnosis, and development of added infections. If they have chosen the wrong antibiotic or intake incorrect dose, it can drastically reduce the immunity against bacteria and arises in drug resistance. This requires pharmacist to intervene and develop strategies aimed towards better patient care and improving their quality of life.

The results of our study showed that prevalence of self-medication of antibiotics is slightly high in males (50.95%) when compared to females (49.05%). The results of our study states that participants between 15-25 years showed higher use of self-medicated antibiotics (86.16%).

According to educational status, undergraduates (63.53%) have shown higher use of self-medicated antibiotics as compared to postgraduates (31.24%) and higher secondary (5.24%). A similar study

revealed that, the self-medication with antibiotics were higher in males (65.8%) than in females (34.2%).

On assessment of knowledge about taking antibiotics without prescription, 86.48% participants have said that taking antibiotics without prescription is not right or the correct method to get treated. A previous study stating that lower knowledge about antibiotics were assessed based on socioeconomic characteristics such as age, gender and education. Amoxicillin (42.88%) was the most commonly used antibiotic for fever (37.31%) and the least used was clindamycin (6.27%) for acne.

According to a study conducted on prevalence and predictors of self-medication with antibiotics, amoxicillin was the most commonly prescribed antibiotic. A study by Selvaraj *et al* found that most common illness associated with self-medication is fever (31%). Similar observations were seen in another previous study conducted. Most common group of drugs used for self-medication in present study found to be analgesics (66.28%). These findings corroborate with findings of another research.

Out of 578 participants, 190 had taken antibiotics for 3 days (32.87%). Participants depending on pharmacists for source of information were found to be higher (46.99%) and the least dependent source

was leaflets (2.33%) and main source of antibiotic supply was pharmacy (94.29%).

Olumide Ajibola *et. al.* conducted a study on self-medication with antibiotics, attitude and knowledge of antibiotic resistance and it was found that the main source of information about antibiotics was family and friends (34.3%).

From Table 10, the participants taking antibiotics based on previous experience was found to be higher (69.03%) as compared to others. Table 11 and Figure 5 depicts that majority of the participants' health condition has been improved on taking the antibiotics (73.69%).

Our study shows that nausea/vomiting were found to be higher (48.41%) followed by weakness (29.05%) and those who did not experience any side effects were found to be less (4.29%). A study conducted by Shah *et al* shows that the most common side effects were sleep problems (46.5%) and allergic reaction (38.8%) followed by nausea / vomiting (29.7%).

CONCLUSION

A prospective study on the effect of antibiotics as self-medicated drug was carried out in 578 participants. Based on our study we concluded that males were predominant over females in taking self-medicated antibiotics and the prevalence of self-medication were higher in undergraduates. The result suggests that the most commonly used antibiotic was amoxicillin for fever and participants have been using the antibiotic based on previous experience of taking the medication.

Factors such as limited health education, time saving and inadequate access to a doctor are the determinant cause for people to seek advice from a local pharmacist or to indulge in self-medication instead of taking advice from a certified medical professional. Irrational use of antibiotics and lack of complete knowledge about the course of antibiotics, their side effects can lead to microbial resistance and increased morbidity.

Thus, the study is an informative educational survey which can serve the purpose of providing detailed analytical proofs about the rational use of antibiotics. The study can be used by healthcare professional in attempt to correct the unhealthy approach of antibiotics use by patients. The results of this study clearly indicate that the public needs to be updated on the antibiotic resistance crisis and the safe use of antibiotics.

As a clinical pharmacist, we can provide better patient counselling and improve their knowledge on rational use of antibiotics.

Limitations

The period of study was limited to 6 months. Following up of participants was difficult. Elderly people were not willing to give consent and time for the study.

Future directions

- ✓ To conduct a community-based study in rural areas to create awareness on self-medication.
- ✓ To carry out a survey to assess the knowledge, attitude and practice of pharmacists towards dispensing OTC antibiotics and to find out drug sale rate in community pharmacy.
- ✓ To carry out a survey among special population-pregnant and lactating women, organ failure patients and paediatrics, as there is a scarcity of data about the practice and impact of self-medication usage among them.

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CONFLICTS OF INTEREST

The author declares that there is no conflict of interest to disclose.

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