A Study on Antibiotic Selfmedication Practice among the Students of Bengaluru

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Abstract: Self-medication of antibiotics is becoming a common type of self-care behavior among the population of many countries. Unwanted use and vague use of antibiotics have led to a bigger problem, which is drug resistance. A large scale study in the students of this kind has never been carried out in the students at Bengaluru. Our study aims to learn the self-medication patterns with antibiotics in students and create awareness about the darker side of its misuse which leads to the rise of superbugs. This prospective observational study was conducted in students of various education backgrounds. This study also points out the various reasons and causes of self-medication among the students.

Hence forth the above study showed that self-medication is very prevalent among the students and is practiced as it is more convenient than meeting a health care practitioner.

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I. Introduction

Self-medication is the treatment of common health problems with medicines specially designed and labelled for use without medical supervision and approved as safe and effective for such use. Medicines for self-medication are often called 'non - prescription' or 'over the counter' (OTC) and are available without a doctor's prescription through pharmacies. In some countries OTC products are also available in supermarkets and other outlets. Medicines that require a doctor's prescription are called prescription products (Rx products).

In 1995 the WHO Expert Committee on National Drug policies stated: "Self-medications is widely practiced in both developed and developing countries. Medications may be approved as being safe for self-medication by the national drug regulatory authority. Such medicines are normally used for the prevention or treatment of minor ailments or symptoms, which do not justify medical consultation. In some chronic or recurring illnesses, after initial diagnosis and prescription, self-medication is possible with the doctor retaining an advisory role.

II. Material And Methods

This prospective observational study was carried out in students of Bengaluru with various educational backgrounds from September 2017 to April 2018. A total of 912 subjects (both male and female) of age $\geq$ 16 years were involved in this study.

Study Design: Prospective observational study
Study Location: This was conducted at various Colleges in Bengaluru.
Study Duration: September 2017 to April 2018.
Sample size: 912 patients.
Sample size calculation: The sample size was estimated on the basis of various similar studies carried out elsewhere across the world.
Subjects & selection method: The study population were given out consents and quetionnaires and were selected based on their response to the consent.

Inclusion criteria:
1. Students
2. Either sex
3. Aged $\geq$ 16to <35 years

Exclusion criteria:
1. Pregnant women;
2. Subjects not willing to give consent to the study
3. Students of age >35 years
4. Students of age <16 years

Procedure methodology

The data collection form was prepared by keeping in mind the objectives and referring numerous studies previously conducted by other scholars. The main aim of the study was to find out THE PREVALENCE OF ANTIBIOTIC SELF MEDICATION IN YOUTH AND SPREAD AWARENESS OF DRUG RESISTANCE in college students at Bengaluru. The questionnaires were given out to students of age between 16-40 and even Google form were rolled out through our website www.antibioticabuse.wordpress.com. The main reasons required to know were reason for self-medication, procurement of medication and seization of course. All the data collected were entered into Excel sheets and compiled for analysis.

A survey on self-medication was done by giving questionnaire forms to people in and around Bangalore, coming to the pharmacy (912 forms). The study was done on all days for six months. All the required data were collected and the same was documented. The data was then entered into MS Excel for easy retrieval and analysis of data.

The data collection forms were developed by referring available literatures. It includes subject demographics, symptoms during self-medication, reason for self-medication, procurement of antibiotics, selection of drug, side effects, seization of course and knowledge of antibiotics and background of the subject.

III. Result

A total of 912 cases were done over a period of six months. Among them 631 of the cases have taken antibiotics and 1 did not take antibiotics, reason being as he may not be aware whether he/she took an antibiotic or may not have knowledge of the medication he choose for treating various illness.

Table 1 :- Total Males and Females in the study

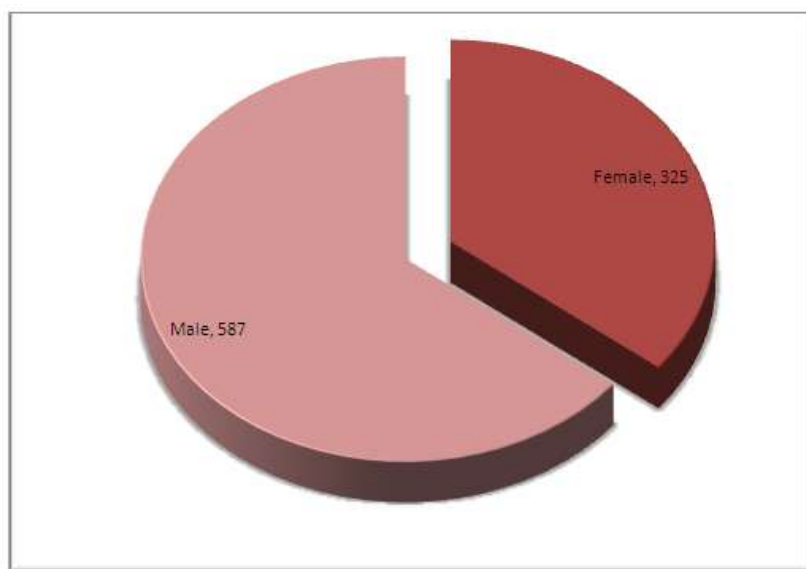| GENDER	MALE	FEMALE
912	587	325

Table 1

Fig 1

Fig 1 shows the ratio of male to female students that took part in the study.

Table 2:- Represents the different age group of students who took part in the study

AGE	FREQUENCY	PERCENTAGE
16-20	329	36.07%
21-25	504	55.26%
26-30	66	7.23%
31-35	8	0.87%
36-40	5	0.54%

Table 2
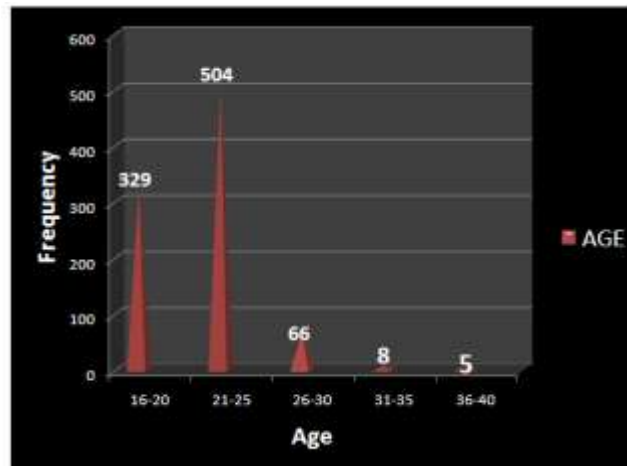
Fig 2

Fig 2 represents the students' age group

Table 3:- Self medication

YES	NO
631(69.2%)	281(30.8%)

Table 3
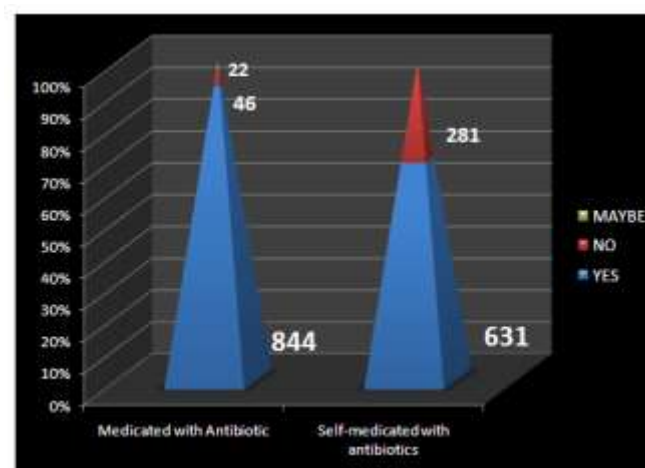
Fig 3

Fig 3:- Represents the number of students that have ever consumed an antibiotic in their life for reasons unknown and out of them how many have ever self-medicated with antibiotics.

Table 4:- Reason for self-medication

COMPLAINT	CASES	PERCENTAGE
Fever	388	20%
Runny nose	195	10%
Nasal congestion	227	11%
Cough	453	23%
Sore throat	297	15%
Aches and pains	151	8%
Vomiting	85	4%
Diarrhoea	90	5%
Skin wounds	84	4%
Others	7	<1%

Table 4
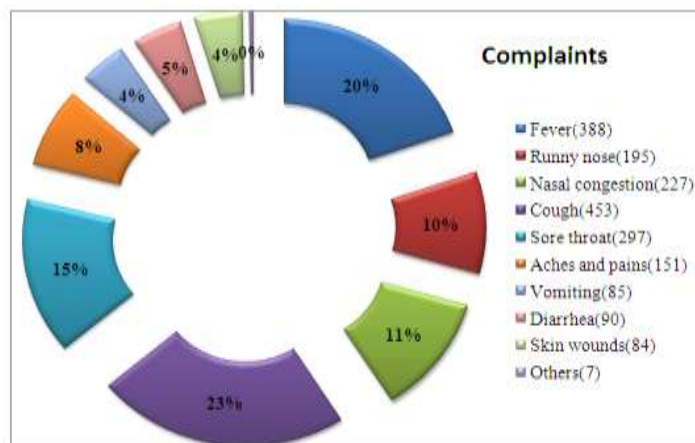
Fig 4

Fig 4:- Represents the complaints for which the self-medication was practiced were as follows

Table 5:- Reason for self-medication

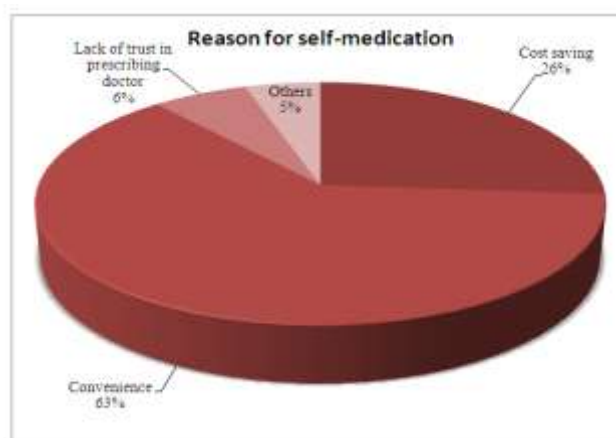| REASON	FREQUENCY	PERCENTAGE
Convenience	480	63%
Lack of trust	48	6%
Cost saving	201	26%
Others	38	5%

Table 5

Fig 5

Fig 5:- Represents the reasons for self-medication, convenience 63%; lack of trust 6%; cost saving 26%; others 5%.

Table 6:- Recommendation of antibiotics

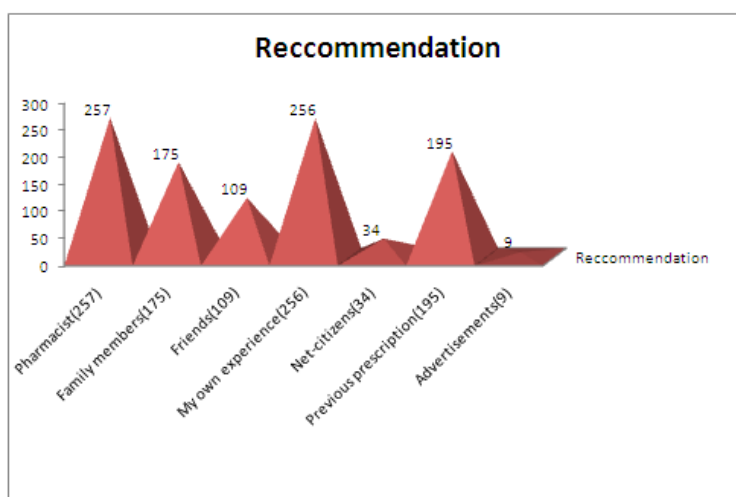| RECOMMENDATION	FREQUENCY	PERCENTAGE
Community pharmacies	257	24.83%
Family members	175	16.9%
Opinion of friends	109	10.5%
My own experience	256	24.7%
Recommendation by net citizens	34	3.2%
Previous doctors prescription	195	18.8%
Advertisements	9	0.86%

Table 6

Fig 6

Fig 6:- Represents who recommended using the antibiotics

Table 7:- Source of procurement of antibiotics

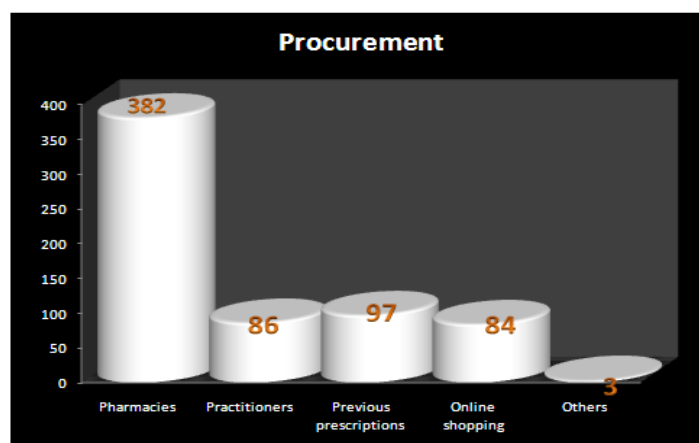| SOURCE	FREQUENCY	PERCENTAGE
Pharmacies	382	58.58%
Practitioners	86	13.19%
Left over from previous prescriptions	97	14.87%
Online shopping	84	12.88%
Others	3	0.46%

Table 7

Fig 7

Fig 7:- Represents the sources of the non-prescribed antibiotics were as follows, pharmacies 382; practitioners 86; left over from previous prescriptions 97; online shopping 84; and other non-specified sources 3.

Table 8:- self medicated antibiotics

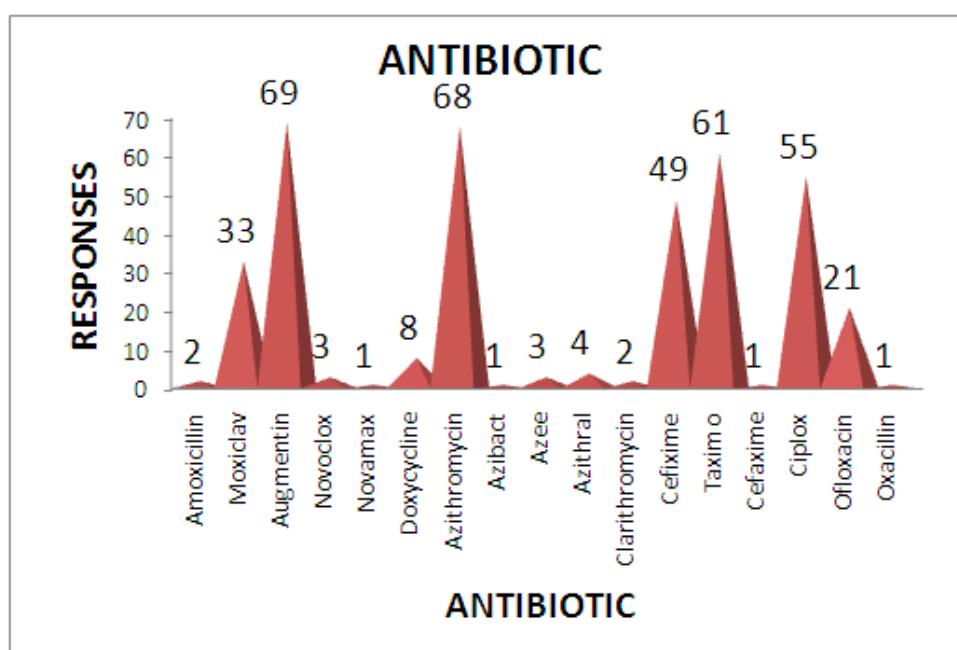| ANTIBIOTIC	FREQUENCY	PERCENTAGE
Amoxicillin	2	0.52%
Moxiclav	33	8.63%
Augmentin	69	18.06%
Novoclox	3	0.78%
Novamax	1	0.26%
Doxycycline	8	2.09%
Azithromycin	68	17.80%
Azibact	1	0.26%
Azee	3	0.78%
Azithral	4	1%
Clarithromycin	2	0.52%
Cefixime	49	12.82%
Taxim o	61	15.96%
Cefaxime	1	0.26%
Ciplox	55	14.39%
Ofloxacin	21	5.52%
Oxacillin	1	0.26%

Table 8

Fig 8

Fig 8:- Represents the most commonly used antibiotic during self-medication.

Table 9:- Commonly used drug

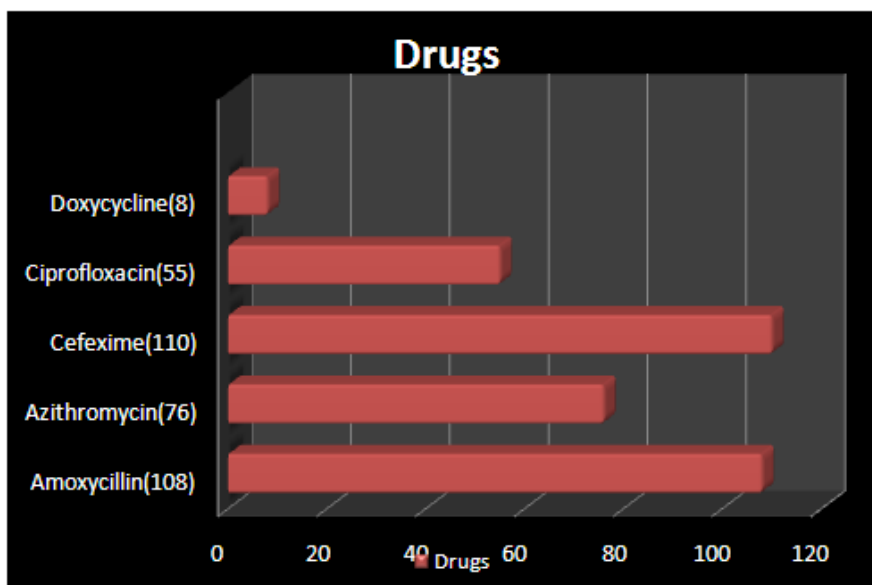| CLASS	FREQUENCY	PERCENTAGE
Cefexime	110	30.81%
Amoxicillin	108	30.25%
Ciprofloxacin	55	15.40
Azithromycin	76	21.28%
Doxycycline	8	2.24%

Table 9

Fig 9

Fig 9:- Represents the frequency of usage of the antibiotics and which is the most commonly self-medicated antibiotic.

Table 10:- Expected Side effects of the antibiotics

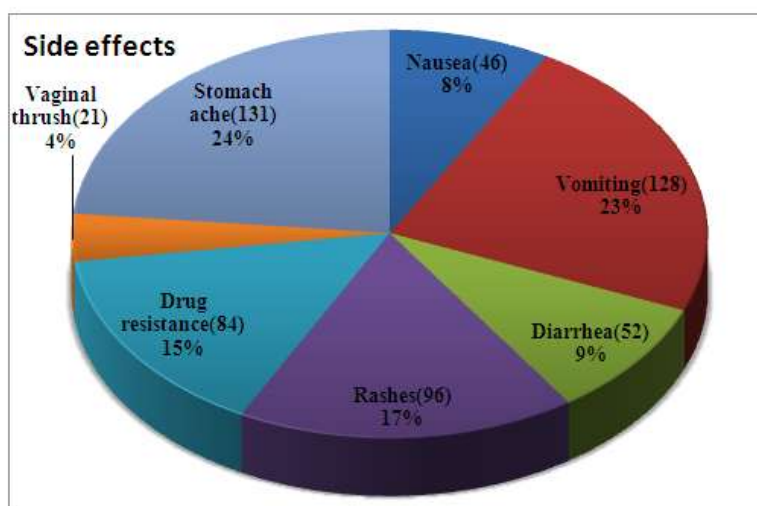| SIDE EFFECTS	FREQUENCY	PERCENTAGE
Nausea	46	8%
Vomiting	128	23%
Diarrhoea	52	9%
Rash	96	17%
Drug resistance	84	15%
Vaginal thrush	21	4%
Stomach ache	131	24%

Table 10

Fig 10

Fig 10:- Represents the list of side effects experienced by the students during the course of self-medication and their predictions of side effects.

Table 11:- Reason to stop the course

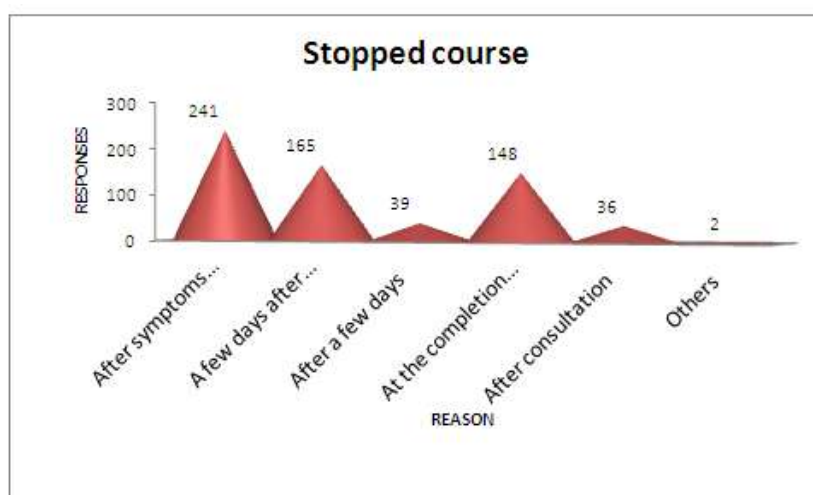| STOPPED	FREQUENCY	PERCENTAGE
After symptoms disappeared	241	38.19%
A few days after recovery	165	26.14%
Regardless of the outcome	39	6.18%
At the completion of the course	148	23.45%
After consulting a doctor/pharmacist	36	5.70%
Others	2	0.31%

Table 11

Figure 11

Fig 11:- Represents the seization of the course were as follows , after symptoms disappeared 241; a few days after recovery 165; regardless of the outcome 39; at the completion of the course 148; after consulting a doctor or a pharmacist 36; others 2.

Table 12:- Background of education

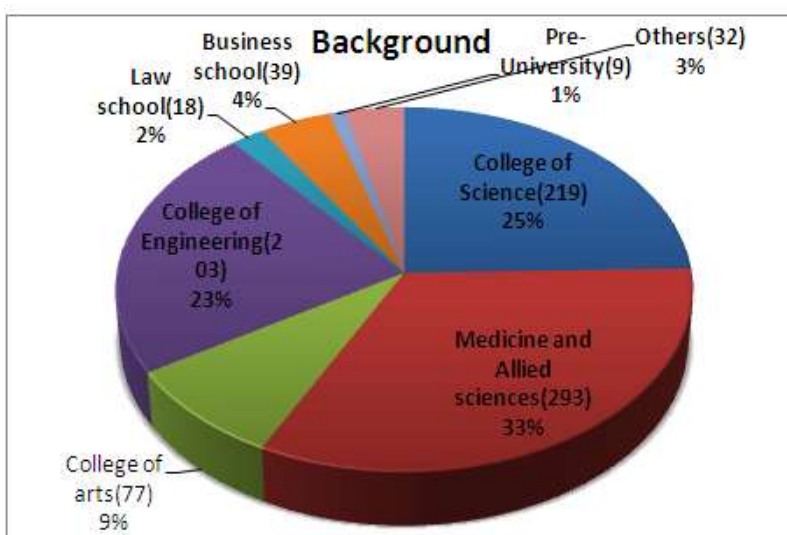| BACKGROUND	PARTICIPANTS	PERCENTAGE
College of science	219	25%
Medicine and allied sciences	293	33%
College of arts	77	9%
College of engineering	203	23%
Law school	18	2%
Business school	39	4%
Pre-University	9	1%
Others	32	3%

Table12

Fig 12

Fig 12:- Represents the background of the students and their course

Table 13 :- Antibiotic indication

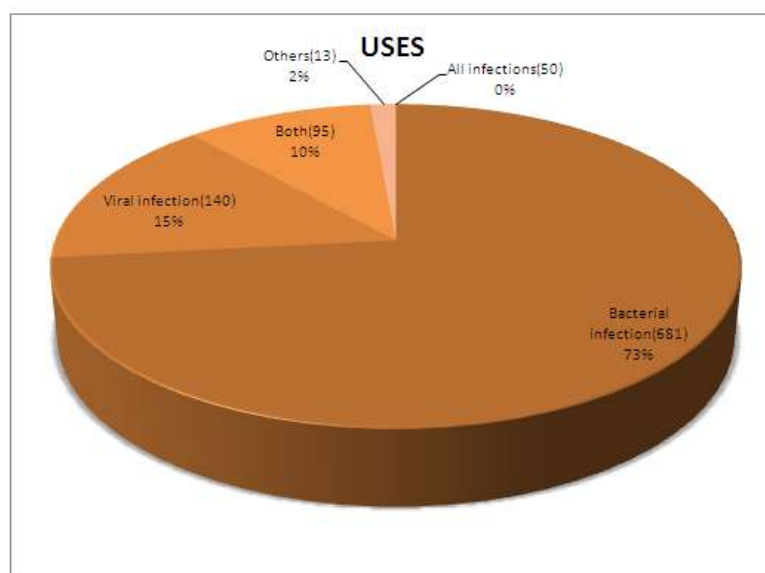| USES	RESPONSES	PERCENTAGE
Bacterial infection	681	73%
Viral infection	140	15%
Both	95	10%
Others	13	2%

Table 13

Fig 13

Fig 13:- Represents the use of an antibiotic bacterial infection 681(73%); viral infections 140(15%); both bacterial and viral 95(10%); others 13(2%).

IV. Discussion

Out of the 912 cases of survey, 69.18% of the study population has taken antibiotics. Youths tend to use more antibiotics than other age groups. Our study was not associated with gender, but was significantly affected by age and educational level. The prevalence of self-medication was found to be high. The observation suggests that traditional, social and cultural factors influence self-medication with antibiotics. Another contributing factor for self-medication with antibiotics is the ease with which antibiotics can be acquired from the community pharmacies.

Intended self-medication and storage of antibiotics at home are both considered to be predictors of actual self-medication. Studies associated with antibiotic misuse are important to prevent the occurrence of antibiotic resistance, which is a well-known problem in most of the countries. The main antibiotics used in self-medication were Cephalosporins and penicillins in general, particularly cefixime(30.18%) and amoxicillin(30.25%) [p value 0.007] by people of age between 16 to 40yrs. Maybe, it is because of the low costs of these class of antibiotics or it could be a result of repetitive and wide prescribing pattern by physicians which has exposed these drugs to a wider population which makes it so familiar to the subjects and people.

Surveillance of antibiotics conducted at many colleges and universities of Bengaluru in India, showed 69.18% average consumption of antibiotics. This study identified that 69.18% of students who took part in the study self-prescribed antibiotics and highlighted patterns of use which was Amoxycillin (0.52%), moxiclav (8.63%), augmentin (18.06%), novoclox (0.78%), novamox (0.26%), doxycycline (2.09%), azithromycin (17.80%), azibact(0.26%), azee (0.78%), azithral (1%), clarithromycin (0.52%), cefexime (12.82%), taxim o(15.96%), cefaxime (0.26%), ciplox (14.39%), ofloxacin (5.52%), oxacillin (0.26%) [p value 0.007] which were the self-medicated antibiotics and were purchased mainly in pharmacies. There were instances of purchasing of drugs from online pharmacies which is blooming in the present scenario of the world and mainly in India which is offering huge discounts and other offers in form of coupons and cashbacks which encourages the population to self-medicate and sometimes keeping in mind the offers purchase more than the required medicines and pushes them towards resistance and self-medication. The antibiotics were used to treat a variety of minor symptoms, such as fever (20%), runny nose (10%), nasal congestion(11%), cough(23%), sore throat(15%), aches and pains(8%), vomiting(4%), diarrhea(5%), skin wounds(4%) [p value <0.001] for mostly less than five days of use. Such practices were based on reasons of previous successful experience, saving time and money, and information obtained from health professionals, lay people, and printed materials.

The patterns of use also indicate inadequate information given to patient as well as to the public. The public should be given proper education and awareness on antibiotics has to be done in a larger scale as they are blind to the fact that common cold and sore throat is not always due to a bacterial cause and mostly viral and during these cases antibiotics do not meet the expectations of curing them. The not curing factor will in turn make the public lose trust on the antibiotic or will force them to change the dose keeping in mind that the dose is inadequate for the treatment and will self-prescribe more and more antibiotics. There are chances of them going and consulting doctors but many a times do not reveal that they were self-medicating as they are scared of the doctor questioning their act and sometimes even ego. In most developing countries, drug information given by health providers in both primary health care centers and hospitals is not optimal. In addition, pharmacy personnel tend to be businessmen rather than professional. When antibiotics are requested by consumers' requests are neither refused nor questioned. Since antibiotics are legally grouped as prescription-only medicines, information about such medicines is, unfortunately, not readily available to the general public, but only to health practitioners. It is different with the over-the-counter (OTC) medicines or general sales, where information about the product can be easily accessed through the packed inserts and mass media advertisements. Currently, there is an initiative to locate Indonesian pharmacists in primary health care centers. Such an initiative is promising, particularly to provide adequate information related to medicines including antibiotics and to improve the quality of health care service in general.

The study focused on reasons for self-medication with antibiotics. The reasons found were cost saving(26.20%), convenience(62.58%), and lack of trust in the prescriber(6.2%) [p value <0.001]. 62.58% of the self-medications was due to the convenience of getting the antibiotics without a prescription and waste their time in consulting a prescriber. Self-medication with antibiotics was taken for various illness like fever, runny nose, nasal congestion, cough, sore throat, aches and pains, vomiting, diarrhea, skin wounds; cough and fever being the major reasons.

It was shown that 22.72% and 22.63% took antibiotics based on the recommendation of the community pharmacist and their own previous experience. Opinion of family members(9.63%), opinion of friends(9.63%), recommendation by net citizens(3.006%), previous doctor's prescription(17.24%), advertisements(0.79%) [p value <0.001] were also the factors that led to the selection of antibiotics. Selection of antibiotics was also based on the brand, price, ADRs etc. The students had partial understanding on how to use the antibiotics or the instructions provided on the back of the blistered pack. It may be due to the lack of education or previous experience with the same antibiotic, that, they didn't check the instruction before use.

Over a period of time, they had changed the dosage or tried different antibiotic for treating the illness. This was done to improve the condition, reducing the ADRs. Reasons for switching antibiotics during the course of the study was that the former medicines did not work or they felt that the dose was not enough for the illness to be cured.

The duration and the factors that made them to stop using antibiotics and not complete the course was after the symptoms disappeared(38.19%), a few days after recovery(26.14%), after the antibiotics ran out(6.18%), at the completion of the course(23.45%), after consulting the doctor or the pharmacist(5.7%) and other unspecified reasons(,1%) [p value <0.001]. But most of them stopped taking the antibiotics after the symptoms disappeared (38.19%) . This clearly shows the lack of education that an antibiotic should not be stopped as soon as the symptoms disappear as the lack of symptoms are a result of antibiotic intake and its actions on the microbes. When the antibiotics are stopped in the middle of the course abruptly there are very high chances of relapse of the infections and they will feel that the antibiotic did not serve its purpose and will lead to further more cases of self-medication and false beliefs.

V. Conclusion

Out of the 912 students, 69.18 %(631).Of the 912(male:587 female:325) students interviewed, 631 took antibiotics without a prescription. The demographic characteristics of the patients are given in table 1 and 2 (age and gender). The sources of the non-prescribed antibiotics were as follows, pharmacies 382; practitioners 86; left over from previous prescriptions 97; online shopping 84; and other non-specified sources 3. Recommendation of antibiotics where as follows, community pharmacies 257(22.72%); family members 175(15.47%); opinion of friends 109(9.63%); my own experience 256(22.63%); recommendation by net citizens 34(3.006%); previous doctor's prescription 195(17.24%); advertisements 9(0.79%) . The complaints for which the self-medication was practiced were as follows, fever 388(20%); runny nose 195(10%); nasal congestion 227(11%); cough 453(23%); sore throat 297(15%); aches and pains 151(8%); vomiting 85(4%); diarrhoea 90(5%); skin wounds 84(4%); others 7(<1%) . The reasons for self-medications were as follows, convenience 63%; lack of trust 6%; cost saving 26%; others 5%. The seization of the course were as follows , after symptoms disappeared 241(38.19%); a few days after recovery 165(26.14%); regardless of the outcome 39(6.18%); at the completion of the course 148(23.45%); after consulting a doctor or a pharmacist 36(5.7%); others 2(0.31%) . The medication which was self-prescribed the most were cefexime 117(31%); amoxicillin 106(28%); ciprofloxacin 79(21%); azithromycin 78(20%) . When interviewed for the knowledge of use of an antibiotic the results were as follows, bacterial infection 681(73%); viral infections 140(15%); both bacterial and viral 95(10%); others 13(2%) .

As they are not aware of the effects of using antibiotics with/without the concern of a physician or a prescription is of great concern. The pharmacist who dispenses such antibiotics without medication should take responsibility on counselling the people regarding the effects and adverse reactions of taking the antibiotics without proper instructions and care.

References

[1].   Laxminarayan R, Duse A, Wattal C, Zaidi AK, Wertheim HF, Sumpradit N, et al. Antibiotic resistance-the need for global solutions. The Lancet Infectious Diseases. 2013;13(12):1057–98. Epub 2013/11/21. doi: 10.1016/S1473-3099(13)70318-9 pmid:24252483.

[2].   Ganguly NK, Arora NK, Chandy SJ, Fairoze MN, Gill JP, Gupta U, et al. Rationalizing antibiotic use to limit antibiotic resistance in India. The Indian journal of medical research. 2011;134:281–94. Epub 2011/10/12. pmid:21985810; PubMed Central PMCID: PMC3193708.

[3].   Armstrong GL, Conn LA, Pinner RW. Trends in infectious disease mortality in the United States during the 20th century. Jama. 1999;281(1):61–6. pmid:9892452.

[4].   Laxminarayan R, Matsoso P, Pant S, Brower C, Barter D, Klugman K, et al. Access to effective antimicrobials: a worldwide challenge. Lancet. 2015;387: 168–175. Published online Nov 18. doi: 10.1016/S0140-6736(15)00474-2. pmid:26603918

[5].   Nordmann P, Naas T, Poirel L. Global spread of Carbapenemase-producing Enterobacteriaceae. Emerging Infectious Diseases. 2011;17(10):1791–8. Epub 2011/10/18. doi: 10.3201/eid1710.110655 pmid:22000347; PubMed Central PMCID: PMC3310682.

[6].   Mudur G: Drug resistant cholera in India attributed to antibiotic misuse. BMJ. 2000, 321: 1368-9. 10.1136/bmj.321.7273.1368

[7].   Svetlansky I, Liskova A, Foltan V, Langsadl L, Krcmery V: Increased consumption of fluoroquinolones is not associated with resistance in Escherichia coli and Staphylococcus aureous in the community. J AntimicrobChemother. 2001, 48: 457-458. 10.1093/jac/48.3.457

[8]. Hillier SL, Magee JT, Howard AJ, Palmer SR: How strong is the evidence that antibiotic use is risk factor for antibiotic-resistant, community -acquired urinary tract infection. J AntimicrobChemother. 2002, 50: 241-247. 10.1093/jac/dkf121

[9]. Farrel DJ, Morrisey I, De Rubeis D, Robbins M, Felmingham D: A UK multi-center study of the antimicrobial susceptibility of bacterial pathogens causing urinary tract infection. J Infect. 2003, 46: 94-100. 10.1053/jinf.2002.1091

[10]. Neu HC: Resistance of *Pseudomonas aeruginosa* to imipenem. Infect Control HospEpidemiol. 1992, 13: 7-9.

[11]. El Amin N, Giske CG, Jalal S, Keijser B, Kronvall G, Wretlind B: Carbapenem resistance mechanisms in Pseudomonas aeruginosa: alterations of porin