A Point prevalence Study of self practice of antibiotics in General Population

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ABSTRACT

BACKGROUND :
The World Health Organisation reports that judicious utilisation of prescriptions happens when patients get sufficient drug for their clinical necessities, at dosages comparing to individual prerequisites, and at the most reduced conceivable expense for the patient and the local area. Considering this definition, a successful medication therapy requires patient consistence and counsel with a clinical expert along with close development, conditions seldom achieved. Unreasonable medication use and particularly self-drug with anti-toxins is normal all through the world. The utilisation of anti-microbial ought to follow explicit standards: the right understanding,
at the Right portion, with the Perfect course and at the Ideal time, however the capacity of antimicrobials to fix bacterial diseases with minimal transient damage to the host has assisted with making the picture of anti-infection agents as "wonder drugs." Anti-toxins are in this way the most widely recognised medications to be utilised improperly and preposterously.
The unseemly use anti-toxins for the treatment of contaminations is an overall issue that has suggestions for the expense of treatment and the improvement of safe kinds of microscopic organisms. The antimicrobials are on first spot on the list of self-controlled drugs in nations that do
not control their commercialisation. It is accounted for that effectiveness of getting drugs without a solution can particularly expand the improper utilisation of antimicrobials. Albeit anti-toxin misuse is a worldwide issue, its most extreme monetary and ecologic impacts are seen in immature nations. All out medicine consumption makes up Drug use has made up the greater part of the medical services use for the everyday person since quite a while now and anti-infection agents are the greatest thing inside the prescription use fragment.

Methods:
population-based point prevalence study was carried out to investigate the knowledge, attitudes and practice of self-medication among the general population of Yelahanka from April to September, 2021. The study was conducted by using both qualitative and quantitative data.
study included only those respondents who were easily available for data collection and interested to provide information willingly. Those who did not feel comfortable to give information were excluded from the study. Also, the people who were incapable of filling out online forms and submitting the data of the same were excluded from the study.

Results:
52.40% of the study participants were males while females comprised 47.60%. The lowest number of people were in the age group of <18 years with a percentage of 5.20% while the highest number of people were in the 25–50 years age group with a percentage of 63.60%. Another 31.20% of people were in the age group and the remaining data was collected on why self medication was preferred and on what basis the self medication was Administered

Conclusion: study has demonstrated that self practice of medication is very common among the general literate public of Yelahanka which was facilitated by easy availability of drugs and information from previous prescriptions. the use of antibiotics, antidepressants, and set details among small segment of respondents without proper follow-up or lab test by health care providers may lead to serious health hazards, not only not only to themselves but also to those to whom they might suggest the medication. Therefore, it is the sole responsibility of the health care professionals and drug regulatory authorities to ensure the safe use of drugs and control the exercise of self-administration of medications by describing the total impact of the drugs on the body to the public. As the study was confined to a small population, further research is needed to test the prevalence of self-medication practices among the general population and how these differ by type of medication. Furthermore, steps should be taken to monitor the drug selling system by stake holders especially of those drugs with potentially harmful effects.

Keywords Antibiotics, Prescription, Daily dose, Safe dose, Antibacterial drugs, Drug utilisation, Statistics, chi-Square Test, Medication, Self Medication, Pharmacovigilance, Rational Drug Utilisation, Social Media, Survey Questionnaire.

Background

The World Health Organisation reports that rational use of medicines occurs when patients receive adequate medication for their clinical needs, at doses corresponding to individual requirements, and at the lowest possible cost for the patient and the community. Taking this definition into account, an effective drug treatment requires patient compliance and consultation with a medical professional together with close follow- up, conditions rarely attained. Irrational drug use and especially self-medication with antibiotics is common throughout the world. The use of antibiotics should follow specific criteria: the right patient, at the Right dose, with the Right route and at the Right time, but the ability of antibiotics to cure bacterial infections with little short-term harm to the host has helped to create the image of antibiotics as ‘‘miracle drugs.’’ Antibiotics are therefore the most common drugs to be used inappropriately and unreasonably. The inappropriate use antibiotics for the treatment of infections is a worldwide problem that has implications for the cost of treatment and the development of resistant strains of bacteria. The antibiotics are on top of the list of self-administered drugs in countries that do not control their commercialisation. It is reported that easiness of obtaining drugs without a prescription can especially increase the inappropriate use of antibiotics. Although antibiotic abuse is a global problem, its most severe economic and ecologic effects are seen in underdeveloped countries. Total medication expenditure makes up Medication expenditure has made up more than half of the healthcare expenditure for the common man since a long time now and antibiotics are the biggest item within the medication expenditure segment.

The irrational and excessive use of antibiotics is an important problem for our country and antibiotics take first place among all drugs used in India with 22%. There are no legal restrictions or obligations regarding the sale and prescribing of antibiotics. self practice of medication is a human trait in which an individual (or a member of the individuals’ family) selects and uses medicines or any other substances for the treatment of self-recognised or self-diagnosed physical or psychological ailments.

Conventionally it has been described as the intake of drugs, herbs or other home remedies on an individual’s own persuasion or taking the advice of another person without consulting a physician. Thus, it forms an integral part of patients’ self-care which in fact is the first choice and is one of the most crucial tools when an individual encounters common health problems that do not require a doctor’s visit.Due to insufficient medical facilities, the free accessibility of over-the-counter (OTC) drugs in the local market and the impoverished national drug regulatory policy, it is now becoming a very common occurrence in numerous countries of the world. Other reasons for self-medication are the shortage of time to visit a physician, inability to get a quick appointment, mild illness, long distance of hospitals and clinics from home, and finally unaffordable doctor’s fees.

Moreover, extraction of much information from online sources, magazines or periodicals makes people courageous about treating their own illness. However, people are endangering their lives by practicing self-medication as it can lead to habituation, lethal allergic reactions, under dosage of medication which may not alleviate the symptom, and also over dosage that can cause collateral injury to different organs. The substances which are most extensively self-medicated are OTC drugs and dietary supplements. Besides analgesics, antimalarials, antibiotics, and cold syrups are intermittently used for self-administration. Sometimes some psychoactive drugs like recreational drugs, alcohol, and comfort foods are self-medicated to alleviate the symptoms of mental distress, stress, and anxiety. The practice of self-medication has become very familiar throughout the world with a high prevalence rate in developing countries. Some studies have found that the amplitude of self-prescribing rate with antibiotics in Asia is 4–7.5% which is higher that of 3% in northern Europe. Although self- medication, when practiced precisely can save time and is also cost effective to the patients where professional care is relatively expensive and not readily available, there are several critical health hazard issues that should be considered before endorsing the potential benefits of self-medication.Sometimes it may lead to wastage of resources, boost up resistance to pathogens, and cause severe health problems, including adverse drug reaction, addiction, and ultimately death. There are no examples of data relating health hazards and health care utilisation including the practice of self-medication among young adults, but it is expected that they are highly motivated towards self-administration of drugs by the internet and media. Over-the-counter (OTC) drugs are the only drugs which can be self-prescribed and sold in convenience stores, grocery stores, and health shops without prescription as they are less hazardous. In India, Paracetamol, ORS saline, metronidazole, ranitidine, omeprazole, aspirin, and diclofenac sodium etc. are accepted to be sold as OTC drugs. However, due to immoral drug sellers and improper regulation, 90% of stocked drugs are sold without any prescription and therefore the phenomenon of self-medication is a common topic in our country. Considering all this evidence, this research work focuses on assessing the perceptions about self-medication practice among the people in the local area of Yelahanka which includes both working and student population. The study also compares their attitudes toward and the extent of practicing self-care between males and females, as well as their awareness regarding the rational use of medications and antibiotics.

Data and Methods

Sources

In this study the The area of Yelahanka was chosen as the study area due to certain restrictions during the COVID-19 pandemic. The study area was sufficient due to its abundance of working population (urban/rural). Also, the presence of schools and colleges allowed for a diversified population of students of various age groups.

population-based point prevalence study was carried out to investigate the knowledge, attitudes and practice of self-medication among the general population of Yelahanka from April to September, 2021.
The study was conducted by using both qualitative and quantitative data.
study included only those respondents who were easily available for data collection and interested to provide information willingly. Those who did not feel comfortable to give information were excluded from the study. Also, the people who were incapable of filling out online forms and submitting the data of the same were excluded from the study. The study included a total of 500 participants, who understood English and were permanent residents of Yelahanka, with different socioeconomic background. People who were visiting or resided temporarily in Yelahanka were not taken into consideration. Before the collection of data, the participants were clearly informed about the purpose of the study and the consent was taken from the respondents to evaluate and use their data for this project. This included only those respondents who were easily available for data collection and interested to provide information willingly. Those who did not feel comfortable to give information were excluded from the study. Also, the people who were incapable of filling out online forms and submitting the data of the same were excluded from the study. A simple random sampling technique was used for the selection of study participants. The sample size was calculated assuming that 50% of the population had a tendency of self-medication practice with 5% margin of error and 95% confidence interval. The sample size was calculated to be 464. However, to ensure more representative data, a larger sample size of 500 was selected for this study.

Data collection

The procedure of data collection was segmented into three steps. The first step was to fill out the questionnaire including socio-demographic information by the study subjects. The second step was to discuss the study protocol, and the final step was to cross-check the questionnaires filled by the respondents.
The questionnaire was adopted from a formerly published study which was developed, standardised, and previously used by Kumar et al.

The questionnaire was divided into four segments and consisted of close-ended and open-ended questions. Section 1 contained questions related to socio-demographic information of the respondents. Section 2 included questions about the practice of self- medication by the respondents. Section 3 was concerned with the knowledge and awareness related questions of the respondents while Section 4 was on questions related to the perception of the respondents regarding self-medication practice. The questionnaire was distributed among the participants via online form along with the consent form informing them about the study and the collected data was kept confidential. Media sources such as WhatsApp, Telegram, Messenger and the regular mail were used to circulate the link of the form. The respondents were requested to fill the form within their convenience and incase they could not understand any particular section or question, they could mail/text regarding the same. Interviews of the respondents could not be carried out due to COVID restrictions and lack of travel resources

Statistical Analysis

Descriptive statistics was used for the calculation of proportions. The Chi-square test was performed to measure the association between the demographic characteristics and responses to understanding, perceptions and self-use of medication. The p values were calculated by the Chi-square test using Microsoft Excel using the Chi Test Function. An alpha level of 0.05 or less was considered significant. Microsoft Word and Excel was used for data analysis, chart, graph, and diagram preparation.

RESULTS

Basic Demographic Information

52.40% of the study participants were males while females comprised 47.60%. The lowest number of people were in the age group of <18 years with a percentage of 5.20% while the highest number of people were in the 25–50 years age group with a percentage of 63.60%. Another 31.20% of people were in the age group

18–25 years. Among the respondents 80.40% of respondents were from an urban area and 19.60% were from a rural area. As shown in table 1

SELF PRACTICE OF MEDICATION

Table 1 Demographic characteristics of respondents. (n=500)

Item	Sub Group	Number(n)	Percentage %
sex	Male	262	52
	Female	238	48
Age Group	<18 Years	26	5
	18 - 25 Years	156	31
	21-25 Years	318	64
Area of Residence	Urban	402	80
	Rural	98	20

The practice of self-medication by the respondents from various parts of Yelahanka. From the table we get a clear scenario that the majority of respondents reported practicing self-medication (88.0%). The practice of self- medication among both males and females (45.20% and 42.80% respectively) was almost similar with no significant difference ($p > 0.05$). As shown in Table 2.

Table 2. Practice of self-medication of the respondents.

Item	Response	Male		Female		Total (%)	*p*-Value
		n	%	n	%		
Practice of self medication	Yes	226	45.20	214	42.80	440 (88.0)	0.44
	No	36	7.20	24	4.80	60 (12.0)	

n indicates the number of respondents. p value was determined using Chi-square Test. $p < 0.05$ was considered significant when compared between male and female groups.

PURPOSE OF SELF PRACTICE OF MEDICATION

Demonstrates that the use of self-medication practice for different complications differed insignificantly ($p > 0.05$) between male and female respondents. It can also be seen from the table that respondents used self-medication for headache (71.20%); cough, cold/flu (61.20%); diarrhoea (47.60%); pain (42.80%); stomach ache (32.80%); vomiting (32.00%); rash/allergies (23.60%), and skin problems (16.40%) respectively. Here the percentage of using self-medication for fever was highest and the value was least for each problems.

This is represented in the table 3.1 and 3.2

The purpose of self-practicing of medications by the respondents was categorised into seven broad categories (Table 3.1 and 3.2). The majority of the respondents (59.60%) used self-medication because they thought that they did not need to see a doctor for a minor illness. Easy availability of medicines (32.20%) and emergency use (32.00%) were the secondary reasons for practicing self-medication. Meanwhile quick relief (30.80%), lack of time to consult doctor (25.60%), sufficient pharmacological knowledge (19.20%), and cost effectiveness (12.80%) were other reasons behind self-medication of drugs. The table shows some high values on the purpose of using self-medication, but none of the values was significant ($p > 0.05$). Different categories of medicine which were self-medicated by the respondents for the treatment of ailments are listed in Table 3. From the table it is clear that the use of different classes of drugs showed no difference in use between males and females. Among the drugs the rate of antipyretic consumption was highest (58.40%) by the respondents whereas analgesics (49.20%); antibiotic (39.20%); antacid (38.80%); vitamins (31.60%); anti-allergic (29.20%); cosmetics (22.00%), and anti-diabetics 15.60%) were also used by them.

Table 3.1 Purpose of self-practice of medication in the respondents.

Items	Male		Female		Total (%)	x^2 Value	*p* Value
	n	%	n	%			
Indications for Using Self-Medication							
Headache	89	35.6	89	35.6	178 (71.20)	1.59	0.66
Cough, Cold/ Flu	75	30	78	31.2	153 (61.20)	1.41	0.72
Fever	98	39.2	93	37.2	191 (76.40)	1.62	0.67
Stomach ache	34	13.6	48	19.2	82 (32.80)	1.88	0.62
Diarrhea	66	26.4	53	21.2	119 (47.60)	2.76	0.43
Menstrual Symptoms	0	0	12	4.8	12 (4.80)		
Rash/ Allergies	26	10.4	33	13.2	59 (23.60)	2.46	0.49
Anxiety/ Depression	7	2.8	10	4	17 (6.80)	3.29	0.45
Ear Problems	3	1.2	2	0.8	5 (2.00)	2.1	1
Vomiting	37	14.8	43	17.2	80 (32.00)	4.54	0.21
Eye infections	7	2.8	9	3.6	16 (6.40)	3.81	0.13
Skin problems	27	10.8	14	5.6	41 (16.40)	1.02	0.83
Tooth ache	17	6.8	11	4.4	28 (11.20)	0.41	1
Insomnia	3	1.2	3	1.2	6 (2.40)	3.13	1
Pain	51	20.4	56	22.4	107 (42.80)	5.2	0.15
Reason for Self-Medication							
Minor illness	72	28.8	77	30.8	149 (59.60)	1.35	0.73
Sufficient pharmacological knowledge	27	10.8	21	8.4	48 (19.20)	1.56	0.74
Quick relief	40	16	37	14.8	77 (30.80)	2.17	0.56
Lack of time to consult doctor	35	14	29	11.6	64 (25.60)	3.99	0.26
Cost effectiveness	22	8.8	10	4	32 (12.80)	1.28	0.86
Easy availability of medicine	52	20.8	36	14.4	88 (35.20)	3.02	0.39
Emergency use	34	13.6	46	18.4	80 (32.00)	2.19	0.53

It was found that among different types of drugs respondents used ophthalmic preparations the least with a percentage of 1.60%.

Table 3.2 Purpose of self-practice of medication in the respondents.-1

Type of Self-Prescribed Medicine							
Analgesics	63	25.2	60	24	123 (49.20)	0.6	0.93
Antipyretics	44	17.6	53	21.2	146 (58.40)	2.44	0.48
Antibiotics	48	19.2	50	20	98 (39.20)	**2.64**	**0.44**
Antiemetics	13	5.2	20	8	33 (13.20)	4.3	0.22
Antidiarrheals	27	10.8	12	4.8	39 (15.60)	1.73	0.66
Antacids	71	28.4	75	30	97 (38.80)	3.58	0.31
Sedatives	11	4.4	12	4.8	23 (9.20)	4.38	0.2
Anti-allergic	36	14.4	37	14.8	73 (29.20)	3.15	0.38
Vitamins	40	16	39	15.6	79 (31.60)	7.62	0.05
Ophthalmic preparations	1	0.4	3	1.2	4 (1.60)		1
Cosmetic products	21	8.4	34	13.6	55 (22.00)	1.72	0.64

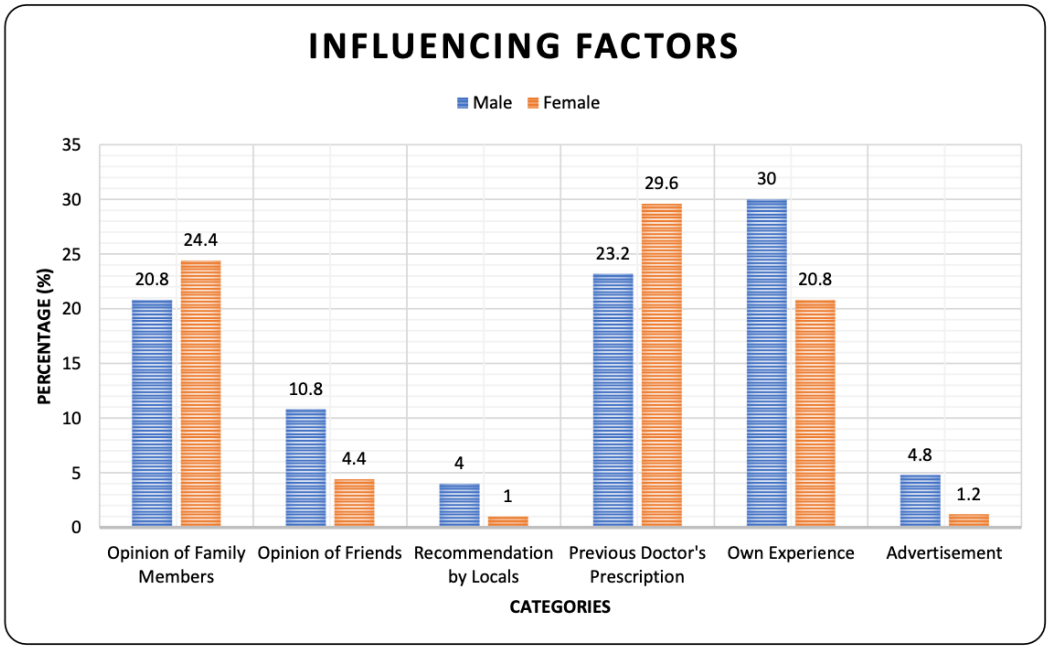
Data is represented both as number and percentage (%). n indicates the number of respondents.
p values from Chi-square tests between male and female groups.

FACTORS INFLUENCING SELF PRACTICE OF MEDICATION

Table 4 represents a respondent's opinion on the factors (predefined categories from the survey) which influence the practice of self-medication. A major portion of the respondents (52.80%) said that they had self-prescribed a drug based on the previous doctor's prescription for the same disease. Another 50.80% respondents had previous experience of practicing self-medication while the opinions of family members (45.20%) and of friends (15.20%) were also influential factors for self-medication practice by the respondents. Advertisement (6.00%) and recommendation by local people (5.60%) were the least influential factors for self-prescription of medications.

Table 4. Influencing factors for the selection of medications for self-practice by the respondents.

Factors	Male		Female				
	n	%	n	%	Total(%)	x^2 Value	*p* Value
Opinion of the Family	104	20.80	122	24.4	226(45.26)	1.74	0.63
Opinion of the friends	54	10.80	22	4.4	76(15.20)	1.62	0.65
Recommended by Local People	20	4.0	8	1.6	28(5.6)	1.14	0.57
Precious Doctor's Prescription	116	23.20	148	29.60	132(52.80)	0.40	0.94
Own Experience	150	30.00	104	20.80	127(50.80)	9.08	0.03
Advertisement	24	4.8	6	1.20	15(6.00)	1.63	0.44



KNOWLEDGE ON SELF PRACTICE OF MEDICATION

Table 5. Knowledge on self-practice of medication

	Male		Female				
Modality	n	%	n	%	Total(%)	x^2 Value	p Value
Idea about self-medication	130	52.0	92	36.0	222 (88.80)	8.84	0.03*
Knowledge about dose completion of self-prescribed medications	90	36.0	79	31.60	169 (67.60)	14.16	0.00
Checking of the insert	120	48.0	89	35.60	209 (83.60)	7.54	0.03*
Checking of the expiry date before use	110	44.0	104	41.60	214 (85.60)	8.17	0.04*

Table 5 is concerned with the information relating to respondents' perceived knowledge on self-practice. The table illustrates that most of the respondents who had self-prescribed medication for different diseases knew about self-medication (88.80%) previously. Among the respondents 83.6% had a tendency to check the package insert while 85.6% respondents had a sound attitude towards checking the expiry date of the

drug before using it. Furthermore 67.6% respondents had concerns about the importance of completing the course of the drug. All the results differed significantly ($p < 0.05$) when compared between male and female respondents.

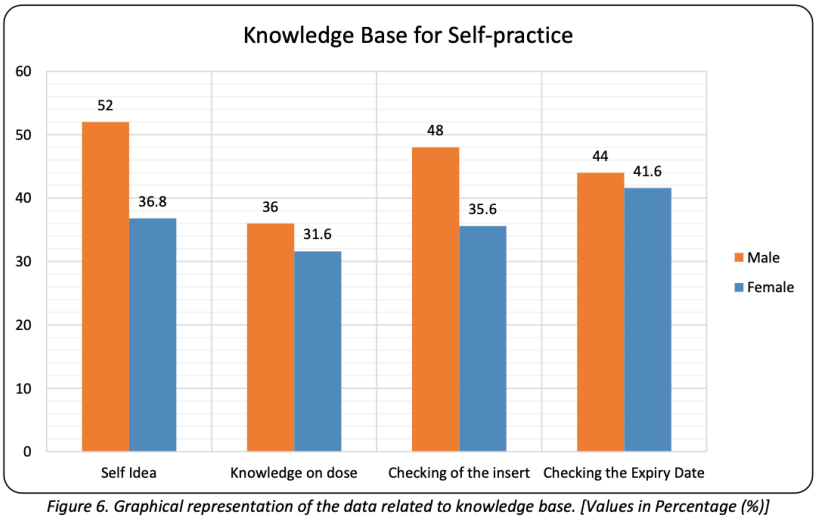


Figure 6. Graphical representation of the data related to knowledge base. [Values in Percentage (%)]

ATTITUDE TOWARDS SELF-PRACTICE

Figure 7 represents the respondents' approach on self-prescription of medication for self-healthcare.
From the figure it is clear that the respondents' concept about self- medication was classified into three categories namely good practice, acceptable practice, and not acceptable practice. Both male (51%) and female (43%) considered self-medication an acceptable practice while another 17% male and 13% female students considered self-practice of medication was good.
Moreover, the diagram also shows that 32% males and 44% females thought self-medication was not an acceptable practice.

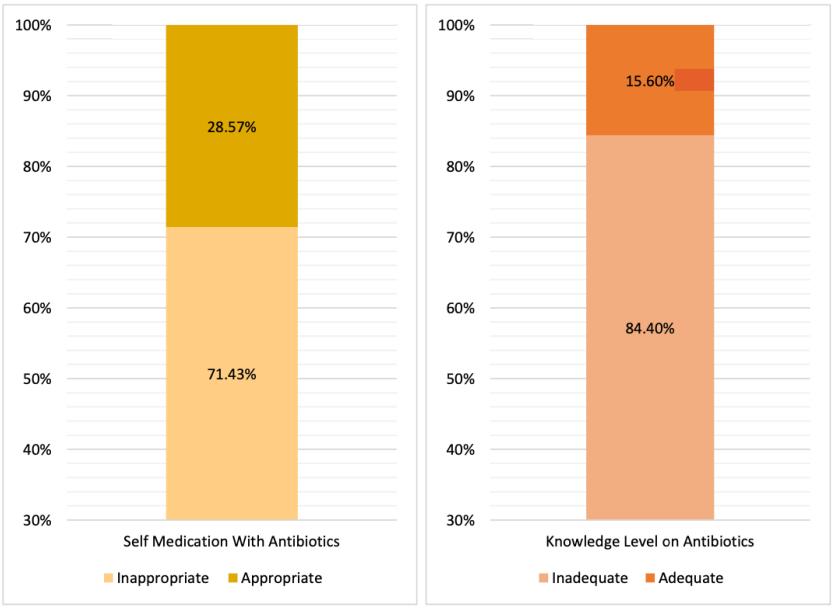


Figure 15. Attitude towards self-practice of antibiotics.

ANTIBIOTICS IN SELF-PRACTICE

Out of the complete respondents (n=500), a total of 39.2% (n=196) respondents admitted to the practice of self-medication using antibiotics. Self-medication with antibiotics was practiced for cold/flu (35%), fever (19%), aches and pains (12%), dental pain (9%), stomach pain (9%),

diarrhoea (7%), eye infection (4%) etc. (Figure 9). The main reasons for self-medication with antibiotics were previous successful experience (35.7%), the illness being minor to seek medical attention (28.57%) and with intention of getting quick relief/ for emergency use (25.51%).

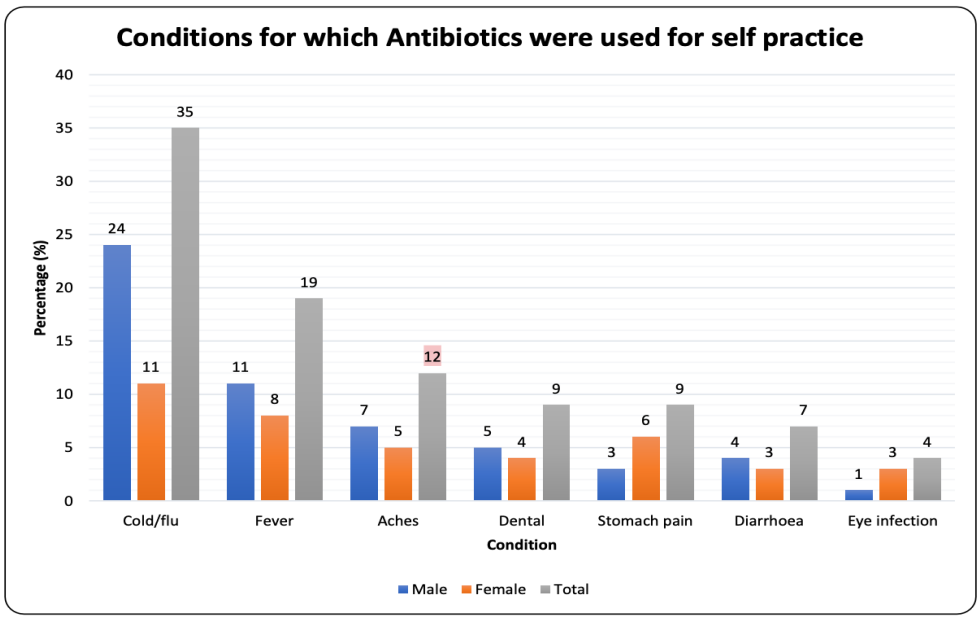


Figure 9. Data representing various disease conditions for self-practice of antibiotics

FREQUENTLY USED ANTIBIOTICS.

Of those who self-medicated with antibiotics, 84.1% used amoxicillin at least once. It was followed by ciprofloxacin (6.7%), tetracycline (2.51%), co-trimoxazole (2.09%), metronidazole (1.67%) etc. Antibiotics used for self-medication were obtained mainly from pharmacy retail outlets (68.0%), leftovers (15.2%), friends and/or relatives (10.4%) and source

unknown (6.4%). Their source of information for the use of the antibiotics among others were internet/mobile application (46.9%), previous doctor's prescription (28.5%), friends/ relatives (8.8%), and pharmacy professionals (5.3%). Additionally, of those who self- medicated, 10.1% guessed the dosage of the antibiotics.

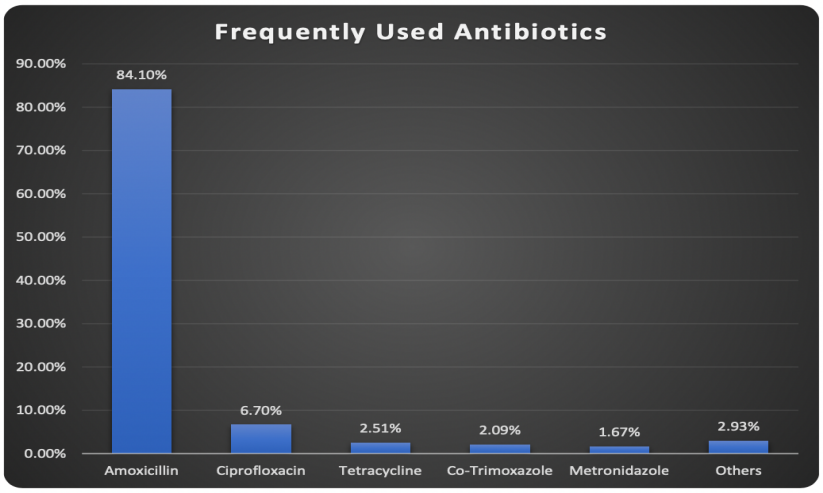


Figure 11. Distribution of antibiotic choice among the respondents.

SELF-PRACTICE AND DOSAGE WITH ANTIBIOTICS

Out of the 196 respondents who self-medicated with antibiotics, 36 (18.36%) respondents admitted they changed the dose of the antibiotics they used for self-medication, whereas 74 (37.75%) quoted they sometimes deliberately changed the dose for the following reasons:
condition improved 42 (56.75%), condition worsened 18 (24.33%), drug insufficient for complete treatment 6 (8.1%), to reduce ADRs 6 (8.1%) and 2 (2.7%) of them believed they were knowledgeable to decide to change the dose. Majority (43.87%) of them however, have never changed the dose of the antibiotics they used.

metronidazole (1.67%) etc. Antibiotics used for self-medication were obtained mainly from pharmacy retail outlets (68.0%), leftovers (15.2%), friends and/or relatives (10.4%) and source

unknown (6.4%). Their source of information for the use of the antibiotics among others were internet/mobile application (46.9%), previous doctor's prescription (28.5%), friends/ relatives (8.8%), and pharmacy professionals (5.3%). Additionally, of those who self- medicated, 10.1% guessed the dosage of the antibiotics.

ATTITUDE TOWARDS SELF-PRACTICE WITH ANTIBIOTICS

About three-fourth (71.43%) of the respondents had a belief that use of self-medication with antibiotics is inappropriate (had positive attitude) while the rest (28.57%) believed that self-medication with antibiotics is acceptable practice. Overall, 84.4% of the participants had inadequate knowledge on antibiotics and only 15.6% were found to be knowledgeable.

Discussion

People have always been very cautious about their personal health status and for this they have
used self-medication, a feature of healthcare, from ancient times. Although self-medication has many pros and cons it depends on who uses it and how it is used for self-treatment [4].

We focused on the general public with good literacy and understanding because they have basic awareness on medicines and are more cautious about the safety of drugs which is lacking in other general population (especially rural areas with less literacy).

Thus, the viewpoint of the aware citizen on the self-medication practice can be considered as a major factor to judge the characteristics of their future prescription pattern.

People of India frequently use self-medication and gender difference has not been shown to have any influence on the practice of self-medication. The reason behind insignificant gender differences in the overall exercise of self- medication may be the study format that allowed the respondents to select drugs by themselves [5].

In our study we found that about 88.0% of the respondents' self- practice different types of medication.

A similar type of study was conducted by Kumar et al. [4] in coastal south India and signified that the amplitude of self- medication practice was 78.90%. Several research works carried out in other developing countries revealed that the prevalence of self-medication was 38.5% and 43.2% among the general public in Ethiopia [22,23], 51% among citizens in Slovenia [24] and 80.9% among female university students in Malaysia [28]. The major influential reason behind the higher propensity of self-medication might be the unregulated easy availability of all categories of medicine without prescription. Similar to some previously published articles [22,29–31], headache, common cold, fever, pain, and vomiting were the most common symptoms for self-administration of medications mentioned by the respondents. It was quoted in our study report that the most common cause for self-treatment with drugs was the insignificance of the illness which did not require a doctor's visit. Similar outcomes were reported by the study conducted in India [7,32]. This type of attitude of the respondents may be attributed to a disregard and absence of consciousness about the advancement of diseases. Sometimes the people who practice medication for self-treatment may suffer from a serious illness as the symptoms of many diseases are primarily mild but wrong diagnosis and treatment may promote serious health hazards. However, in agreement with other studies, easy availability of medicines [4,6], quick relief [16], and time saving [33] were found to be the other causatives for preferring self-medication practice. As stated earlier, antipyretics, antibiotics, analgesics, antacids, and antidiarrheal drugs were the most common classes of drugs self-prescribed for treatment by almost all of the respondents in our study. Almost identical observations were found in the studies conducted in India [4,34],

where these common classes of drugs were frequently used for self-practice. Meanwhile, the use of antibiotics was different to that of analgesics and antipyretics. This tendency is because of the lack of knowledge of general public on the resistance and side effects of antibiotics. Inappropriate or irrational use of these drugs can lead to various hazardous effects including the reduction in the capability of microbial flora to resist detrimental microorganisms, the development of multi-drug resistance, addiction, toxicity, and other related syndromes [32].

Therefore, such kind of practice should be discouraged. A major source of information on self-prescribed drugs was from previous prescriptions for the same illness and this result was analogous to the findings of the study conducted in India [4,33]. Further, other researches conveyed in India [34] reported the internet as another common source of knowledge on self-prescribed medicines which was a major source of information in our study results. The difference in prevalence of self- medication with antibiotics might be due to differences in study design, community awareness, and definitions.

It was revealed that amoxicillin was the most frequently used antibiotic for self-medication. This might be explained by the fact that it is a well-known antibiotic to the community compared to other antibiotics and its ease of accessibility. Most of the respondents in this study had the notion that self-medication with antibiotics is an inappropriate practice. That being said, the high prevalence of self-medication despite the positive attitude reflects further interventions are required to hammer the issue of antibiotic use without prescription by all available means.

Also, the respondents did show significant level of deviation in dosage regimen of the antibiotics they use for self-practice which is quite dangerous and may lead to fatal consequences. The fact that majority (52.80%) of the respondents gathered information about self-medication from the previously prescribed medicines of physicians was consistent with the research work conducted earlier [37]. However as some of the respondents were younger, they were also influenced by other sources like previous illness experiences, opinions of family members, friends and local people, and advertisement.

This result resembles formerly conducted research findings [23,37]. Less awareness related to dosage, reading the included insert etc. was seen in the respondents who admitted the use of antibiotics for self- practice. As discussed earlier, it could be due to the lack of general awareness regarding the dose or side effects which may arise due to their use. Self- medication can only be considered a part of self-care if legitimate use of medicaments can be ensured.

It may lead to accidental drug toxicity as there is always a risk of using expired drugs and also sharing with friends or taking medicines that have been actually prescribed for other problems

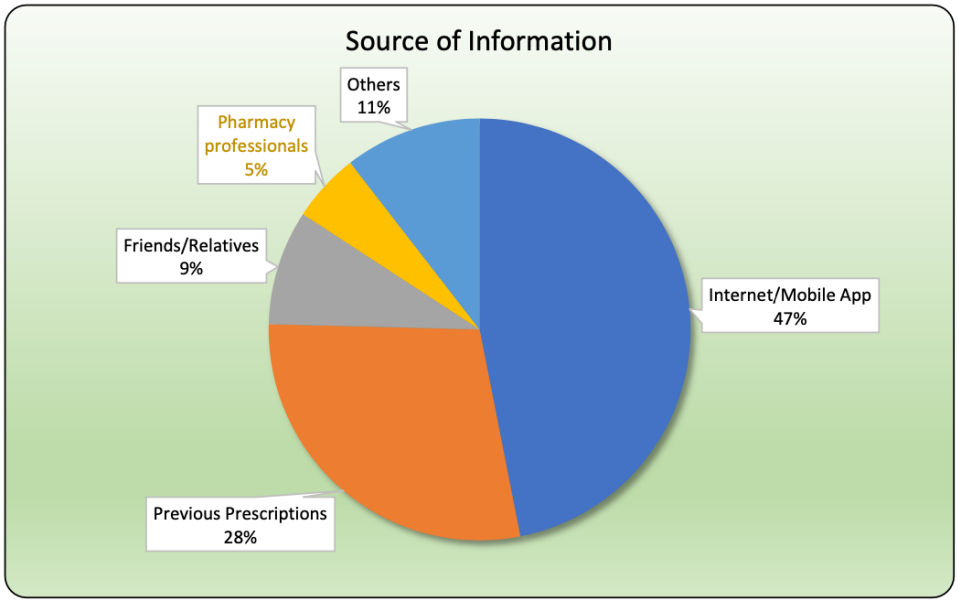


Figure 13. Source from which information related to antibiotic use was obtained.

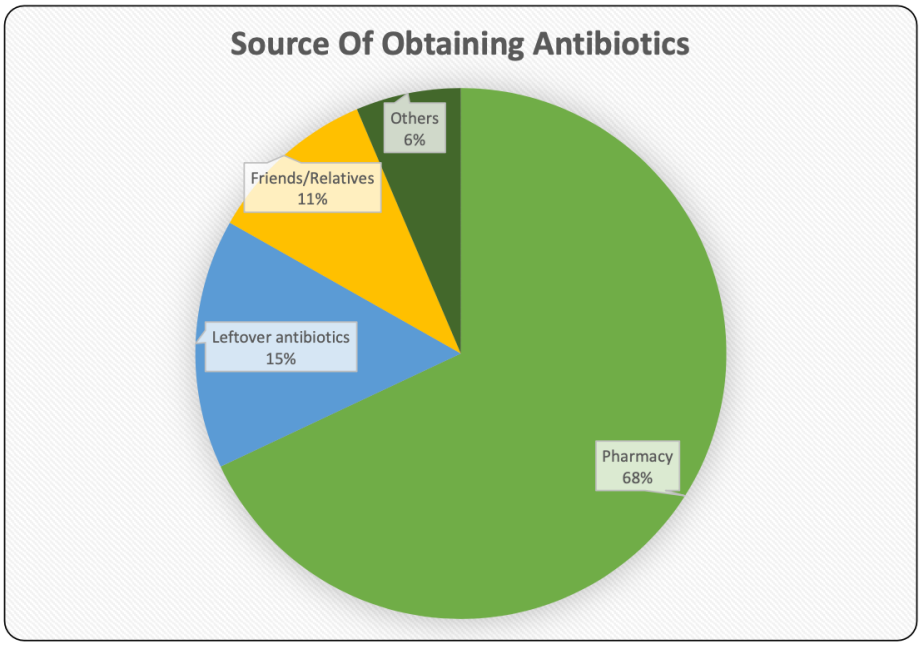


Figure 12. Source from which antibiotics were obtained by the respondents.

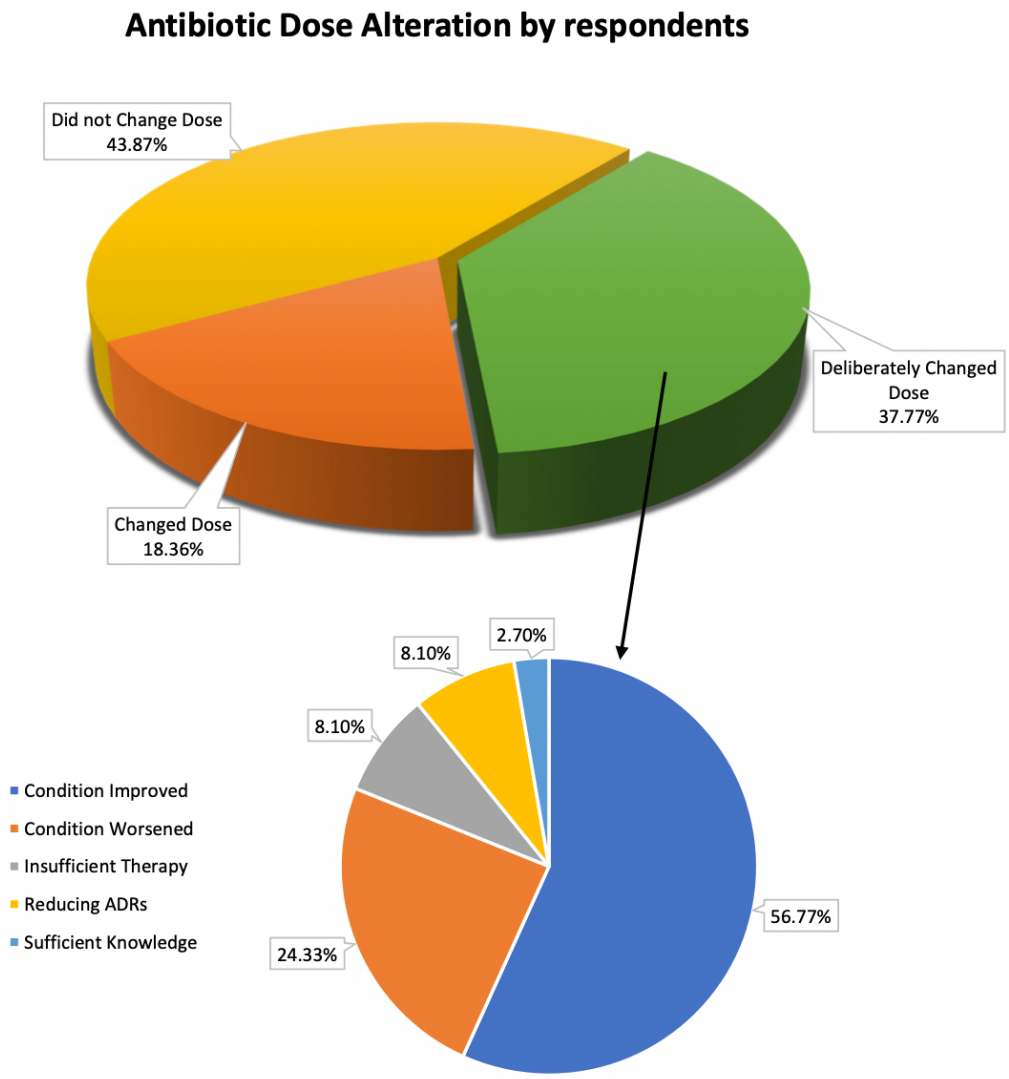


Figure 14. Overview of dose alteration and supposed reasons for the same.

Limitations

The study had few limitations as some complications were faced during the lock down (Covid) first week of world only a small area of population due to shortage of time for the research work if we had conducted the study in more areas we would have got a more extensive scenario on the self medication practises among the general Literate and aware public of Yelahanka and nearby areas. Second due to lock down feasibility of travelling was not available and hence interviews could not be conducted face to face Third, some people and the younger age group who were primarily students were less familiar with some terminologies and complication were created during the understanding of the questionnaire. They had to be given extra explanation via text and calls. Finally, social desirability bias may have impacted the responses since the interviews were not done in person. The initial phase of the study during the first couple of weeks saw a really slow rate of response from people which gradually increased and more and more responses started to come. Another limitation would be the respondents' truthfulness in submitting the information to their best of knowledge due to fears of privacy and confidentiality despite of assurance.

Despite being a descriptive study, it still lacks in terms of variability and quantity of data and analytical tools to furthermore strengthen the study and come to more clear analytical values, thus, this can also be considered as a limitation of this study.

Conclusions

This study has demonstrated that self practice of medication is very common among the general literate public of Yelahanka which was facilitated by easy availability of drugs and information from previous prescriptions. the use of antibiotics, antidepressants, and set details among small segment of respondents without proper follow-up or lab test by health care providers may lead to serious health hazards, not only not only to themselves but also to those to whom they might suggest the medication. Therefore, it is the sole responsibility of the health care professionals and drug regulatory authorities to ensure the safe use of drugs and control the exercise of self-administration of medications by describing the total impact of the drugs on the body to the public. As the study was confined to a small population, further research is needed to test the prevalence of self-medication practices among the general population and how these differ by type of medication. Furthermore, steps should be taken to monitor the drug selling system by stake holders especially of those drugs with potentially harmful effects.

Though majority of the respondents considered self-medication with antibiotics as inappropriate practice, their antibiotic seeking behaviour without prescription was found to be prevalent. Respondents' poor knowledge about antibiotics and antibiotic resistance as well as overestimating the power of antibiotics, and accessibility of antibiotics without prescriptions in retail pharmacies could be the possible drives for self-medication. Therefore, corrective measures such as enforcement of existing laws and scheduling of medicines to regulate their access to the public would protect them from misuse. Besides, healthcare professionals and media outlets should play their role in counselling the general public to refrain from use of antibiotics without prescription.

The role of today's pharmacist comes in crucial as they can be the pivotal point in turning the tides against the misuse of medications and irrational use of antibiotics. They can indulge in more studies and research works and bring out the more intricate details which might prove to be significantly beneficial for bringing about changes in not just how the pharmacy functions, but also to implement better and stricter rules which cannot be worked around. They can also indulge in works related to pharmacovigilance to keep a check over illegitimate sale and distribution of not only OTC medications, but also regulated and scheduled drugs which are more dangerous and may lead to fatal consequences if kept unchecked. An approach towards making amends and creating a more functional and safer healthcare system starts from the ground and moves up. The basic goal of the pharmacist is to ensure the safety and efficacy of medications being used by the public in any setup. A clinical pharmacist has the pharmacological expertise to guide not only the general public, but other healthcare professionals as well to promote a healthier form of prescribing, be it from a medical practitioner or self-practice by the common public. The future of the modern-day pharmacy lies in the power of social media and Artificial intelligence (AI). Social Media can be exploited tremendously as more and more people in India and other developing countries are getting addicted to the use of Facebook, WhatsApp, Instagram and other platforms where information regarding self-practice of medications
(especially scheduled drugs and antibiotics), it's merits and demerits, approach towards self-practice under guidance from the clinical pharmacist or any other healthcare practitioner who has the knowledge and expertise in the field of drugs and its pharmacology, duration, dosage, side-effects, how to overcome emergency situations etc. can be shown through videos, posts, messages, RTSS feed, with or without the help of influencers which would lead to more and more public getting exposed to honest and appropriate data and information regarding drugs and medications instead of fake/incomplete/made up data. AI can be a powerful tool as machine learning can boost the speeds at which data computing and analysis is done. It will also enable the formulation of stronger, more reliable algorithms which will benefit the researchers and medical professionals with devising strategies and methods to overcome various problems faced during analysis of huge amounts of data.

The key takeaways from this study would be

- Stronger rules and regulations on scheduling use of antibiotics.
- Prevention of sale of antibiotics and other sensitive medications without a legitimate prescription.
- Promoting more and more scientific studies to strengthen data analysis and come to intricate conclusions.
- Spreading awareness related to self-practice via various social medias.
- Using social media to provide essential information related to drugs and medications to the general public.
- More proactive pharmacovigilance activities.
- Indulgence of local authorities to bring a stop on illegitimate sale of drugs especially unsafe and regulated drugs.
- Promoting a healthier and safer community

Abbreviations

RGUHS: Rajiv Gandhi University of Health Sciences
ADRs: Adverse Drug Reactions
AMR: Antimicrobial Resistance
AOR: Adjusted Odds Ratio
CI: Confidence Interval
MOH: Ministry of Health
RTIs: Respiratory Tract Infections
SM: Self-medication
SMA: Self-Medication with Antibiotic
SPSS: Statistical Package for Social Sciences
UTIs: Urinary Tract Infections
WHO: World Health Organization

Declarations

Contribution Of Project Members:
P Neelaphar designed the Study and Providing Institutional Clearance, And also designed methods and the statistical analysis along with creating the questionnaire, tables, graphs etc. Rahul Gupta carried out the data collection via the online forms and segregation of the same. Saurav Kumar Mishra carried out the analysis study in Excel and using Chi square methods, and Rahul Gupta carried documenting the Article.

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