

Assessment of Awareness, Knowledge and Compliance of
Prescribed Antibiotic Use Among Employees of Decision
Resource Group

By

Aru Sharma

*Dissertation submitted in partial fulfillment of the requirements of the degree
MBA Hospital and Health Management*

Academic year, 2017-2019



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TO WHOMSOEVER MAY CONCERN

This is to certify that **Mr. Aru Sharma**, student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at Decision Resource group, Bangalore from **4th February 2019 to 3th May 2019**.

The Candidate has successfully carried out the study on **Assessment of awareness, knowledge and compliance of prescribed antibiotic use among the employees of Decision Resource group, Bangalore** assigned to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.

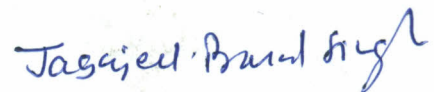


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17 May 2019



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May 8, 2019

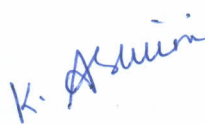
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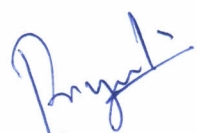
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This is to certify that Aru Sharma has completed his dissertation project "Assessment of awareness, knowledge and compliance of prescribed antibiotic use" with DRG Analytics and Insights Private Limited from 4th February 2019 to 3rd May, 2019.

We wish him all the best for his future endeavours.

Yours Sincerely,


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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **“Assessment of awareness, knowledge and compliance of prescribed antibiotic use among employees of Decision Resources group, Bangalore”** and submitted by **Mr. Aru Sharma** Enrollment No **IIHMR-U/01/2017-19/0543** under the supervision of **Dr. J.P Singh** for award of MBA in Hospital and Health in The IIHMR University carried out during the period from February 2019 to May 2019 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Aru Sharma

Aru Sharma

ABSTRACT

TITLE: Assessment of awareness, knowledge and compliance of prescribed antibiotic use among employees of Decision Resources Group.

AUTHOR: Aru Sharma

INTRODUCTION: Initially, when the antibiotics were introduced to the mankind in 1928 with penicillin being the very first drug. It soon became a sensation world over, as it could treat infections which were previously considered to be fatal. Over the years, many new antibiotics have been discovered and have provided treatment for a variety of bacterial infections. But due to various prevailing myths about its effects and inadequate/improper knowledge regarding its usage, people for long have misused antibiotics which in turn has led to the emergence of bacterial resistance against antibiotics which were previously treated by them. Therefore, it becomes important to assess the awareness, knowledge and compliance of prescribed antibiotic use among public.

OBJECTIVES:

1. To assess the employee's knowledge and awareness to antibiotics
2. To assess the use of prescribed antibiotics
3. To see the relationship between awareness and knowledge of antibiotics and use of prescribed antibiotics

RESEARCH DESIGN:

A descriptive, cross-sectional and observational study was performed by conducting a survey to assess awareness, knowledge and compliance of prescribed antibiotic use. Data was collected from an employee cohort of a corporate consulting firm based in Bangalore through a survey sent via E-Mail (Google

Forms). Study was conducted in a consulting firm based in Bangalore, Karnataka. The total sample size incorporated in the study was 100 respondents. Convenience sampling technique was used to collectively obtain the data from the accessible cohort of employees, 100 responses were obtained from a total of 120 employees to whom the survey was floated. Hence, the response rate was 83.33%.

RESULTS:

More than two third i.e. 71% of the total respondents know that antibiotics are not effective against viruses. Majority of the respondents agree upon the fact that excessive use of antibiotics make them less effective over time. However, 25% of the respondents, a huge chunk, agree on antibiotics being effective against common cold.

Half (50%) the total number of respondents agree to have left the antibiotic course in between because of feeling better. Majority of the total respondents either self-medicate/administer antibiotics or have done so in the past. Throat infection/tonsillitis/sinusitis and common cold are the most common problems for self-administration of antibiotics among respondents. A mighty percentage (31%) of respondents are not making a note of the problem for which they administered antibiotics. 52% of the respondents obtained the antibiotics from pharmacy without prescription.

Despite the fact 88% of the respondents stated they were aware of antibiotic resistance only 41% of them came across any antibiotic awareness campaign. However, 47% of the respondents still expect them to be prescribed an antibiotic for cough/cold/sour throat, none of which is cured by an antibiotic. As 31%, of the respondents cannot even recall as to when they administered an antibiotic lately. This implies that these people are not keeping a proper track of their antibiotic

administration regime, which surely is one of the major reasons for antibiotic resistance.

CONCLUSION:

Just being aware about the term ‘antibiotic resistance’ does not mean that a person also has adequate knowledge about the rational use of antibiotics. The responses obtained through the survey floated implicate a different pattern of antibiotic use among respondents and it shows that even though they claim to be aware of antibiotic resistance, they lack proper and adequate knowledge about their judicial use. Employees should be made aware that they should not purchase antibiotics without prescription as 52% of the respondents obtained the antibiotics from a pharmacy without prescription which possibly can lead to misuse and ultimately contribute in antibiotic resistance. More number of awareness campaigns should be introduced by the organization to educate the employees about the ill effects and consequences of using antibiotics in an unjust manner. The organization (consulting firm) should educate its employees regarding proper and rational use of antibiotics to ensure their optimum utilization.

KEYWORDS:

Antibiotics, Antibiotic resistance, self-medication, Knowledge, Practice, Awareness

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The project was a success due to the help and support of many peoples. I would like to acknowledge the help of all people who contributed towards the completion of my project. First, I would like to thank Senior Director of DRG, Bangalore Priyanka Srivastava for providing me opportunity to work in DRG, Bangalore

I also like to thank my Project Manager Mr. Swarnadip Dutta at DRG, Bangalore for mentoring and guiding me to proceed with the project.

Without the guidance and blessing of Dr. S.D Gupta, Director Indian Institute of Health Management & Research University Jaipur this project would not have been possible for me. My special thanks to col. Dr. Ashok Kaushik, Dean Academics, and students Affairs, IIHMR University, Jaipur for being a continuous guiding source throughout the degree, I would also like to thank Dr. J.P Singh, Associate Professor, IIHMR University, my guide for providing me continuous support for making my project successful.

I would like to express gratitude and appreciation for all the people mentioned above to help me complete my study and make my project successful.

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INTRODUCTION

HISTORY OF ANTIBIOTICS

The administration of microbial diseases in old occasions and nations like Egypt, Greece, and China is well-reported. Antibiotics were acquainted with the world with the disclosure of penicillin by Sir Alexander Fleming in 1928. Penicillin was extremely fruitful in controlling bacterial diseases among World War II fighters and accordingly turned out to be exceptionally prevalent as well. In any case, presently, penicillin obstruction developed as a huge clinical issue, so that, by the 1950s, huge numbers of the advances of the earlier decade which were extremely vital at that point, were compromised.

ANTIOBIOTIC RESISTANCE

Anti-toxin opposition can, in strict terms, be characterized as the capacity of a microorganism to endure and its oppose presentation to antimicrobial medications, in the end undermining the adequacy of effective treatment of disease. Opposition is with the end goal that it tends to be exchanged hereditarily starting with one microorganism then onto the next. Anti-toxin opposition is a broadly perceived general medical problem at the nearby, national and worldwide dimensions. At present, anti-toxin obstruction is a worry as it is never again an indicator of keeping up wellbeing among individuals utilizing it however an expanding danger to fate of wellbeing as antibiotics are typically being abused. Predominance of anti-infection opposition changes among nations yet by and large it is decidedly related with recommended outpatient anti-toxin use at the national dimension. In any case, Antibiotic utilization may even incorporate self-prescription, (for example at the point when anti-infection is being utilized without medicine). This happens using extra antibiotics from recently endorsed courses, antibiotics acquired from relatives or companions or purchased without solution, and antibiotics got both legitimately and unlawfully. Lamentably, in the ongoing past obstruction has in the end been seen to almost all antibiotics that have ever been created. In 1972, Vancomycin was brought into clinical practice by the researchers for the

treatment of methicillin opposition in both *S. aureus* and coagulase-negative staphylococci.

CAUSES OF THE ANTIBIOTIC RESISTANCE CRISIS

1. Overuse

The maltreatment of anti-infection agents has clearly decided the progression of restriction. Previously, epidemiological examinations have appeared quick association between serum poison usage and the ascent and dispersing of safe infinitesimal life forms strains. In minuscule creatures, characteristics can be procured from relatives or can even be acquired from nonrelatives on compact genetic segments, for instance, plasmids. This dimension quality trade (HGT) can empower hostile to disease insurance from be traded among different kinds of minute living beings. Resistance may even happen all of a sudden through change. Anti-microbials empty sedate sensitive contenders, which leaves safe tiny living beings to reproduce because of ordinary decision. Regardless of reprimands as for maltreatment, anti-infection agents are overprescribed around the globe.

2. Inappropriate Prescribing

Inaccurately recommended antibiotics additionally contribute, enormously, to the advancement of safe microorganisms. Studies propose that treatment sign, decision of operator, or length of anti-microbial treatment is normally wrong in 30% to half of cases. One U.S. contemplate detailed that a pathogen was characterized in just 7.6% of 17,435 patients hospitalized with network procured pneumonia (CAP). In contrast with which, agents at an establishment in Sweden had the option to distinguish the likely pathogen in 89% of patients with CAP utilizing atomic analytic procedures (polymerase chain response [PCR] and semi quantitative PCR). Also, 30% to 60% of the antibiotics recommended in serious consideration units (ICUs) have been observed to be pointless, wrong, or problematic. Unreasonably endorsed antibiotics have

faulty remedial advantage and open patients to potential difficulties of anti-infection treatment.

3. Extensive Agricultural Use

Treating domesticated animals with antimicrobials is normally considered to improve the general strength of the creatures, delivering bigger yields and a higher-quality item. The antibiotics utilized in animals are ingested by people when they devour sustenance. As of late, atomic location strategies have appeared safe microbes in ranch creatures achieve buyers through meat items. The horticultural utilization of antibiotics likewise altogether influences the ecological small scale biome. Up to 90% of the antibiotics given to domesticated animals are discharged in pee and stool, and after that generally scattered through manure, groundwater, and surface spillover. While this application represents an a lot littler extent of by and large anti-toxin use, the resultant geological spread can be gigantic. This training likewise adds to the presentation of microorganisms in the earth to development hindering operators, making modifications the ecological biology by expanding the level of safe versus powerless microorganisms. This isn't it as even antibacterial items sold for sterile or cleaning purposes may add to this issue, since they have the capacity to confine the advancement of resistances to natural antigens in the two kids and grown-ups. Thus, safe framework flexibility might be undermined, which expands bleakness and mortality because of diseases which, for the most part, are not destructive.

4. Availability of Few New Antibiotics

The improvement of new antibiotics by the pharmaceutical business, a framework that had been fruitful at battling safe infinitesimal living beings previously, had fundamentally backed off in view of money related and managerial obstructions. Mergers between pharmaceutical associations have also liberally diminished the number and OK assortment of research gatherings. Hostile to microbial research coordinated in the academic network has been cut

back as a result of financing cuts due to the money related crisis. Neutralizing agent poison improvement is never again seen as a fiscally clever endeavor for the pharmaceutical business since antibiotics are used for modestly short periods and are normally therapeutic; antibiotics are not as beneficial as prescriptions that treat interminable conditions, for instance, diabetes, mental messes, asthma, or gastro esophageal reflux. A cost– advantage examination by the Office of Health Economics in London discovered that the net present regard (NPV) of another enemy of disease is just about \$50 million, appeared differently in relation to generally \$1 billion for a medicine used to treat a neuromuscular ailment. Since remedies for unending conditions are progressively useful, pharmaceutical associations need to place assets into them. Another factor that makes against microbial improvement need money related interest is the for the most part negligible exertion of antibiotics. Fresher antibiotics are generally assessed at a farthest point of \$1,000 to \$3,000 per course differentiated and infection chemotherapy that costs a colossal number of dollars. The openness, accommodation, and all things considered insignificant exertion of antibiotics has furthermore incited an impression of low a motivating force among payers and individuals all in all. In like manner, microbiologists and overpowering infirmity experts have provoked limitation as for hostile to contamination use. Accordingly, when another enemy of microbial is exhibited, specialists—rather than prescribing it rapidly—consistently hold this new authority for conceivable later use for simply the most skeptical situations as a result of fear of propelling drug resistance, and they continue underwriting progressively prepared administrators that have shown basically indistinguishable amplex. Thusly, new antibiotics are every now and again treated as "last-line" meds to fight real infections. his preparation prompts the diminished use of new antibiotics and a reduced rate of gainfulness.

5. Regulatory Barriers

Notwithstanding for those organizations that are idealistic about seeking after the revelation of new antibiotics, acquiring administrative endorsement is regularly a hindrance. Somewhere in the range of 1983 and 2007, a significant decrease happened in the quantity of new anti-microbial endorsements. Challenges in seeking after administrative endorsement that have been noted include: organization, nonattendance of clearness, contrasts in clinical preliminary prerequisites among nations, changes in administrative and authorizing rules, and ineffectual channels of correspondence. Changes in norms for clinical preliminary plan made by the U.S. Nourishment and Drug Administration (FDA) amid the previous two decades have made anti-toxin clinical preliminaries especially testing.

LITERATURE REVIEW

Cosgrove SE (2003) et. al called attention to that Antibiotic obstruction is a developing issue around the world, with a frequently negative effect on patient results.

Dellit TH, Owens RC, McGowan JE Jr (2007) et al. expressed that somewhere in the range of 20% and half of anti-infection use is either pointless or unseemly, and diminishing it is a fundamental initial step to control anti-microbial opposition. This learning has prompted the advancement of national proposals to improve anti-toxin stewardship in nations, for example, the USA, France and Scotland.

The proof proposes that a multifaceted methodology is favored, gone for improving the association of the human services framework and changing doctors' recommending conduct.

As per the Centers for Disease Control and Prevention, contemplations show that 30-half of anti-microbials recommended in medical clinics are pointless or wrong. There is no uncertainty that overprescribing, and mis recommending is adding to the developing difficulties presented by Clostridium difficile and anti-infection safe microscopic organisms. Studies exhibit that improving endorsing rehearses in emergency clinics can not just assistance diminish rates of Clostridium difficile disease and anti-infection obstruction, however can likewise improve singular patient results, all while lessening medicinal services costs.

A few investigations have appeared's or guardians' desires for anti-toxin treatment, or desires as seen by the specialist, to be a deciding variable for anti-toxin endorsing.

As indicated by Finch RG, Metlay JP, Davey PG (2004) et al. Most significant obstruction control techniques prescribe training for the overall population to advance fitting anti-infection use.

As indicated by Vanden Eng J, Marcus R, Halder JL (2018) et al. the basis for teaching the open is that information about anti-toxin treatment and familiarity with anti-infection opposition are thought to impact patient and parent interest for anti-infection recommending.

The vast majority of the methodologies for controlling anti-infection opposition, for example, rules, approaches and instructive projects, have been concentrating on both prescribers and open to advance judicious anti-microbial use.

RATIONALE

Initially, when the antibiotics were introduced to the mankind in 1928 with penicillin being the very first drug. It soon became a sensation world over, as it could treat infections which were previously considered to be fatal. Over the years, many new antibiotics have been discovered and have provided treatment for a variety of bacterial infections. But due to various prevailing myths about its effects and inadequate/improper knowledge regarding its usage, people for long have misused antibiotics which in turn has led to the emergence of bacterial resistance against antibiotics which were previously treated by them. Therefore, it becomes important to assess the awareness, knowledge and compliance of prescribed antibiotic use among public.

AIM OF THE STUDY

The primary aim is to examine the awareness, knowledge, attitude, and practice pertaining to the use of Antibiotics in the sample population. The secondary aim was to assess to which degree beliefs, attitudes and socio-demographic factors are associated with Antibiotic resistance.

STUDY OBJECTIVES

1. To assess the knowledge and awareness to antibiotics
2. To assess the use of prescribed antibiotics
3. To see the relationship between awareness and knowledge of antibiotics and use of prescribed antibiotics

STUDY METHODODLOGY

1. RESEACH DESIGN: Observational, cross-sectional, descriptive, study was done to assess the awareness, knowledge, attitude and compliance of prescribed antibiotic use.
2. STUDY POPULATION: The sample size includes employees of Medtech Insights department of Decision Resources Group, Bangalore.
3. STUDY SETTING: Decision Resources Group, Bangalore
4. STUDY DURATION: The research was conducted over a period of 3 months from February 2019 to May 2019
5. SAMPLING METHOD: Convenience sampling, the respondents were selected from a cohort of employees from a department, working in a consulting firm in Bangalore.

6. SAMPLE SIZE: 100 employees of a corporate firm based in Bangalore.

7. DATA TYPE: Primary data

8. DATA COLLECTION: A self-administrated questionnaire was used to collect data. The questionnaire comprises four sections socio-demographic characteristics, knowledge, attitude/behavior, awareness, practice/usage and compliance of antibiotic use.

- Socio-demographic data elicited from respondents included their age, educational background, whether they heard about antibiotic resistance, practice/usage, attitude/behavior usage of antibiotics.
- Knowledge of antibiotic resistance was assessed with multiple choice questions that included effective against virus, common cold etc.
- To assess the prudent use of antibiotics by asking the respondents whether the respondents self-medicated without a doctor's prescription, stock antibiotics, etc.

9. DATA ANALYSIS: Responses were analyzed using Microsoft Excel. Graphical representation was used for data analysis. Primarily, bar charts were used for depiction of the results obtained through responses from various respondents.

6. RESULT:

6.1 Age of respondents

Out of 100 respondents 41% were in the age group of 21-25 years. The mean age is 16 years whereas 13.40 is the standard deviation.

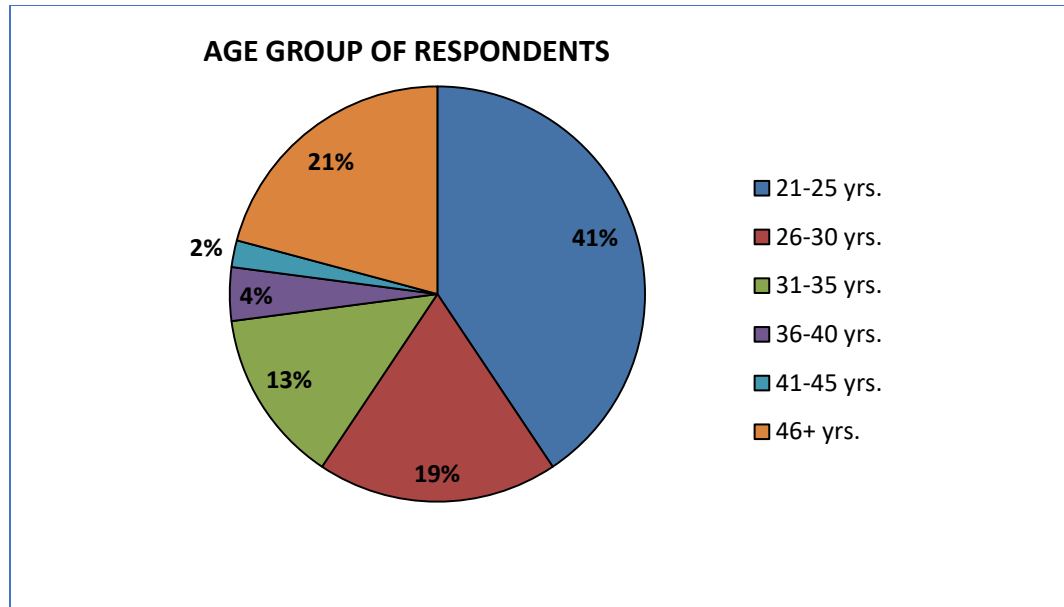


Figure 6.1: Age of Respondents

6.2 Educational Background

73% of the respondents have science as their educational background which includes medical sciences, life sciences, pharmaceutical sciences and engineering.

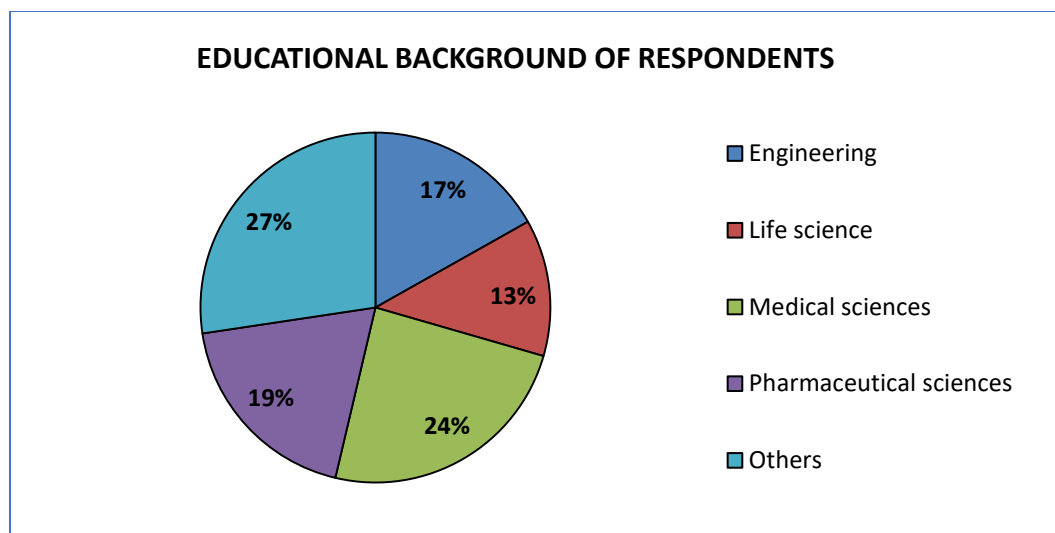


Figure 6.2: Marital status of Respondents

6.3 Awareness about Antibiotic Resistance

88% of the respondents were aware about Antibiotic Resistance.

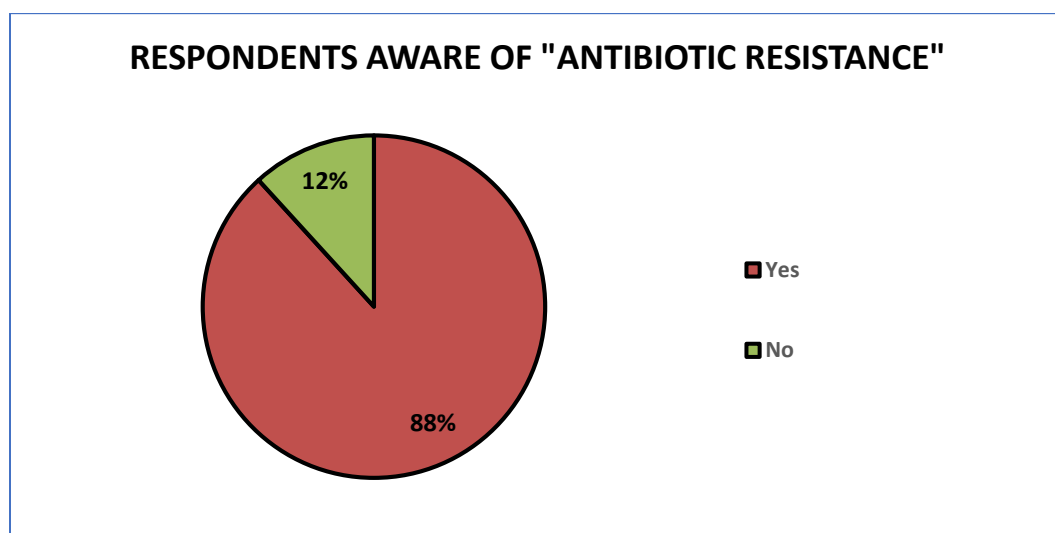


Figure 6.3: Awareness of Respondents about Antibiotic Resistance

6.4 Role of Public in preventing Antibiotic Resistance

Majority of the respondents agree that public's contribution can play a big role in preventing antibiotic resistance

WHETHER PUBLIC'S CONTRIBUTION CAN PREVENT ANTIBIOTIC RESISTANCE IN THE COMMUNITY

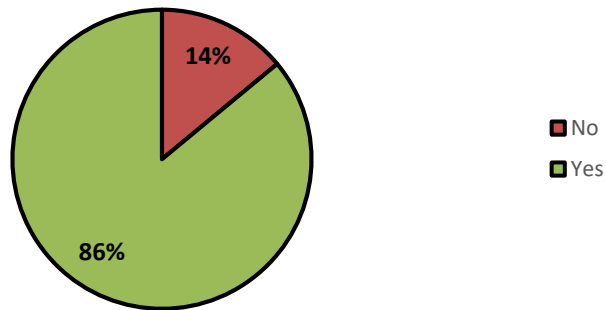


Figure 6.4: Public's role in preventing Antibiotic Resistance

6.5 Whether respondents came across any Antibiotic Resistance Campaign

Majority (59%) of the total respondents did not come across any antibiotic resistance campaign.

WHETHER RESPONDENTS CAME ACROSS ANY ANTIBIOTIC RESISTANCE CAMPAIGN

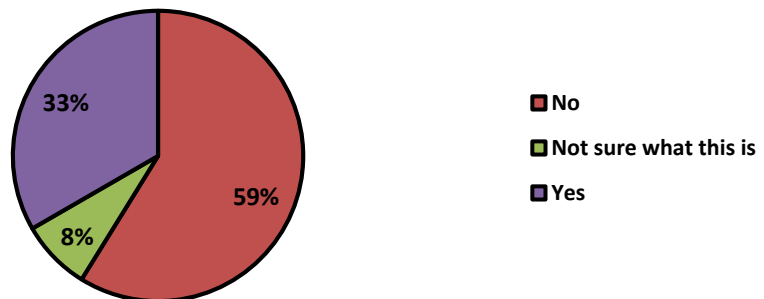


Figure 6.5: If respondent came across any antibiotic resistance campaign

6.6 Source of information on Antibiotic Resistance Campaign

Only 12 % of the total respondents came across antibiotic resistance campaign through government driven health campaigns although social media and

workplaces were the two biggest sources through which information about antibiotic resistance campaign was communicated.

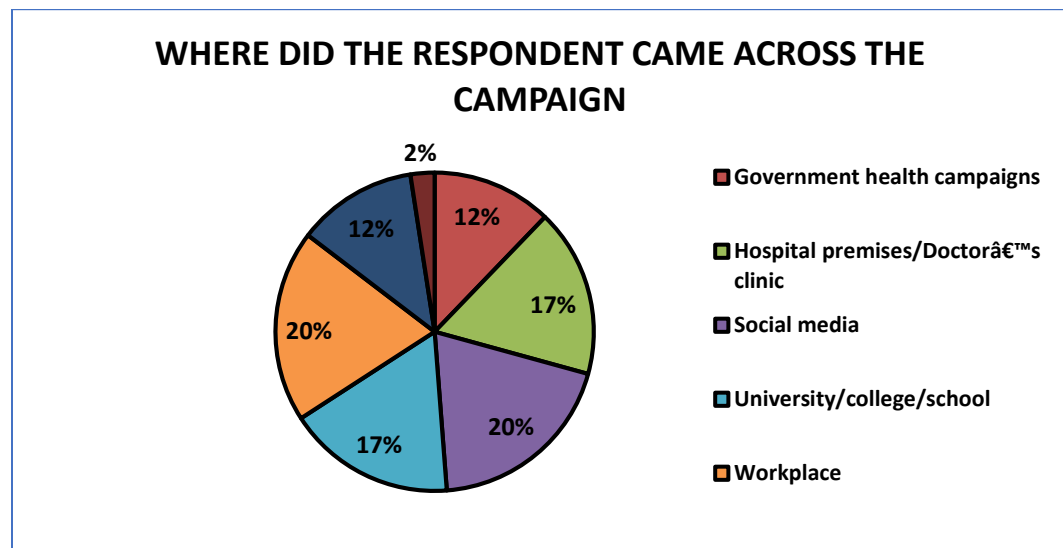


Figure 6.6: Different sources of information on Antibiotic Resistance Campaign

6.7 Antibiotics are effective against virus

More than two thirds (71%) of the total respondents know that antibiotics are not effective against virus.

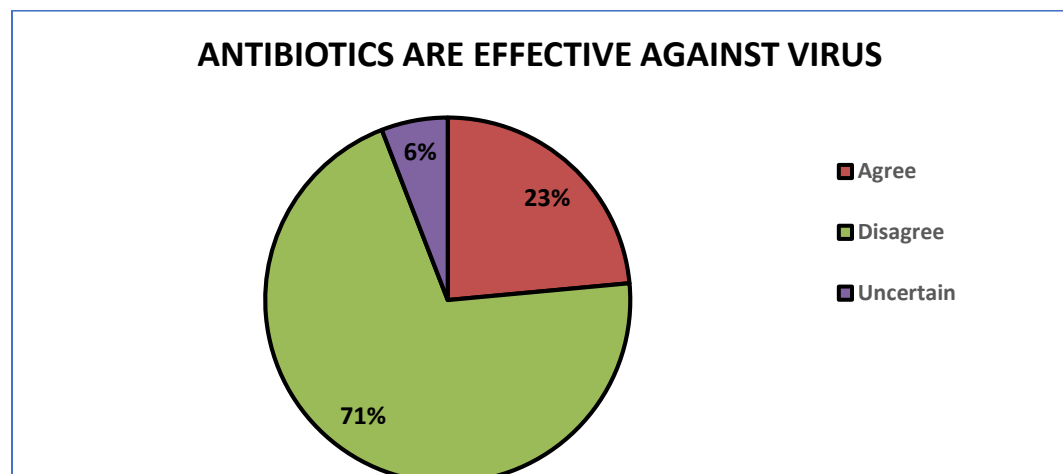


Figure 6.7: Antibiotics vs Virus

6.8 Consequences of excessive use of Antibiotics

Majority (88%) of the respondents agree upon the fact that excessive use of antibiotics make them less effective over time.

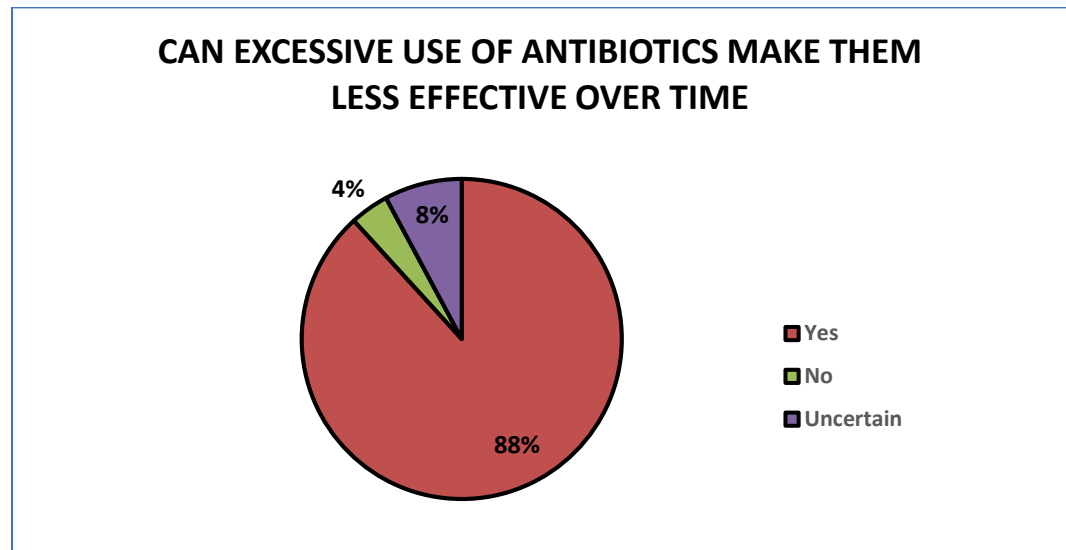


Figure 6.8: Consequences of excessive use of antibiotics

1.9 Effectiveness of antibiotics against common cold

Though majority of the respondents disagree but still 25% of the respondents, a huge chunk, agree on antibiotics being effective against common cold

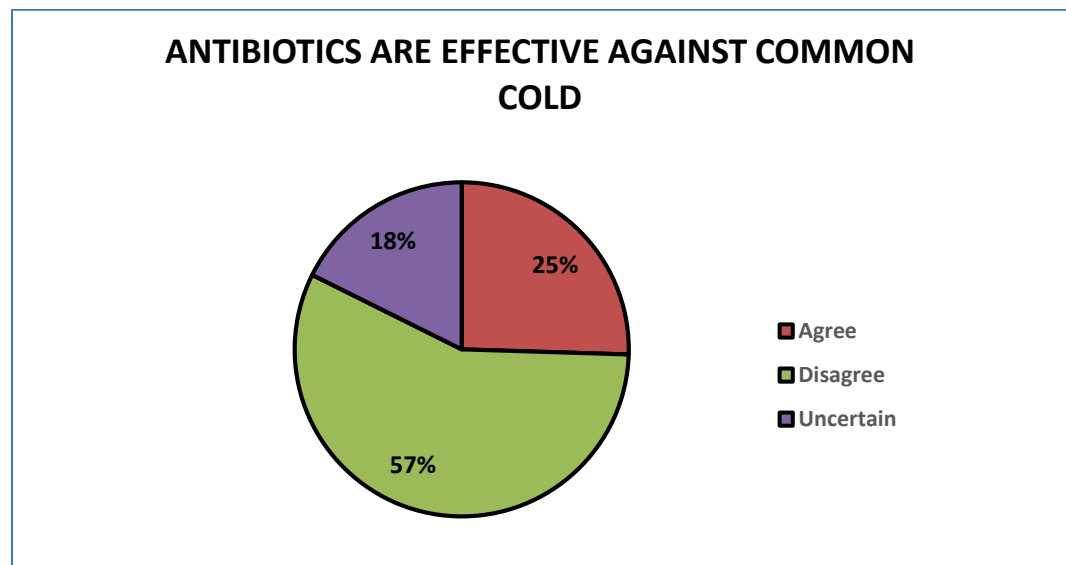


Figure 6.9: Effectiveness of antibiotics against common cold

Respondents expectations to be prescribed an antibiotic for cough/cold/sour throat

Almost half (47%) the number of total respondents expect them to be prescribed antibiotic for cough/cold/sour throat.

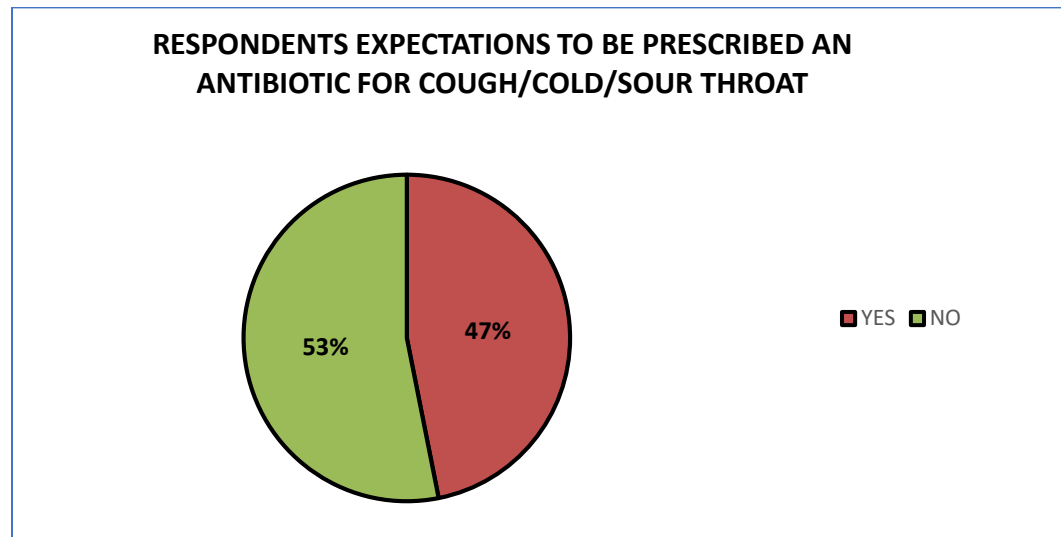


Figure 6.10: Respondents expectations to be prescribed an antibiotic for cough/cold/sour throat

Possible reasons for not completing the antibiotic course

Half (50%) the total number of respondents agree to have left the antibiotic course in between because of feeling better.

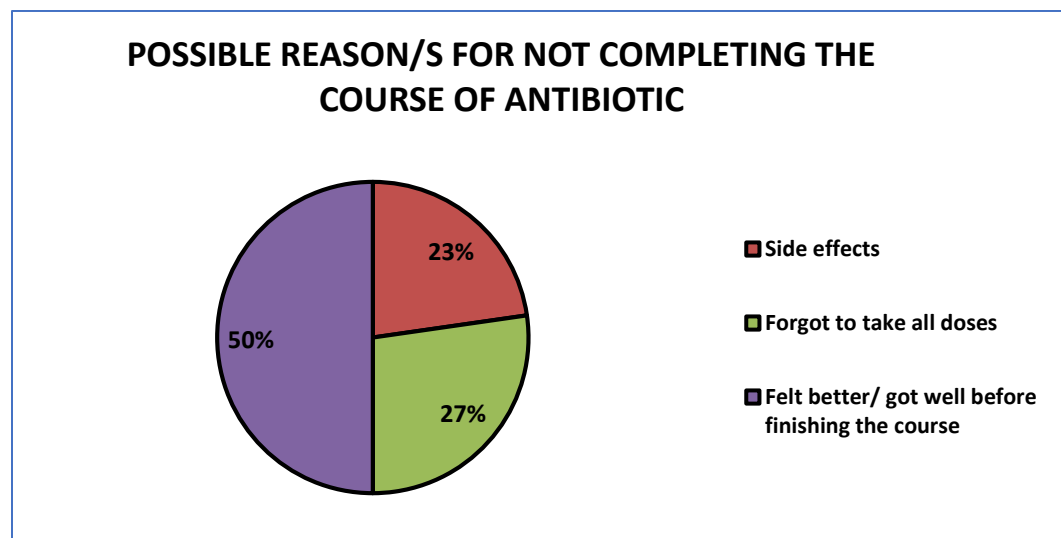


Figure 6.11: Possible reasons for not completing the antibiotic course.

6.12 Self administration of antibiotics without doctor's prescription

Majority of the total respondents either self-medicate/administer antibiotics or have done so in the past.

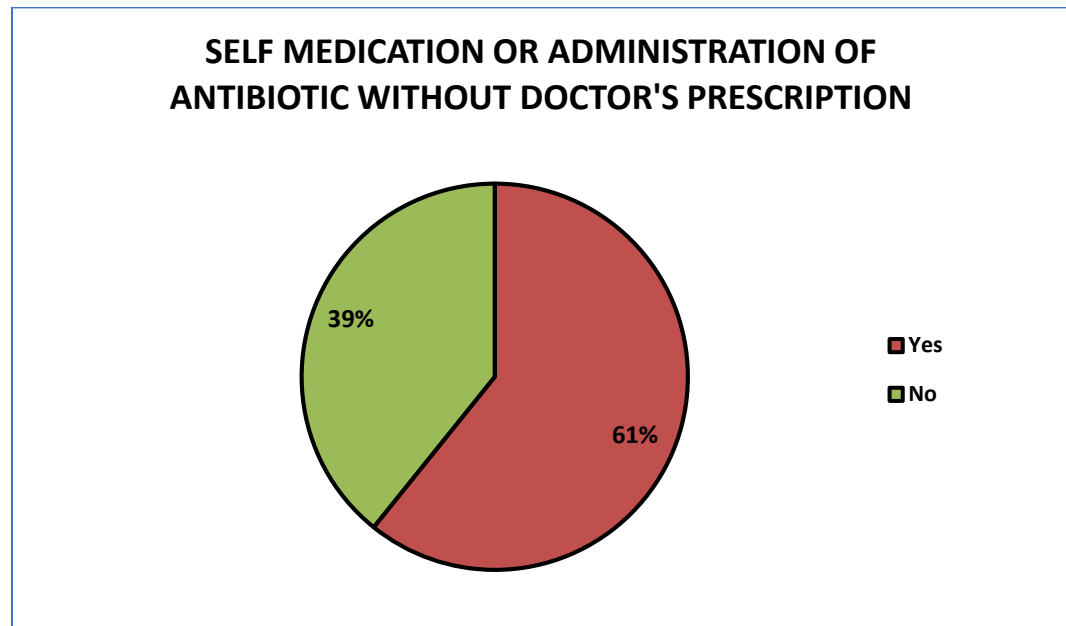


Figure 6.12: Self administration of antibiotics without doctor's prescription

6.13 Problems responsible for self-administration of antibiotics

Throat infection/tonsillitis/sinusitis and common cold are the most common problems for self-administration of antibiotics among respondents.

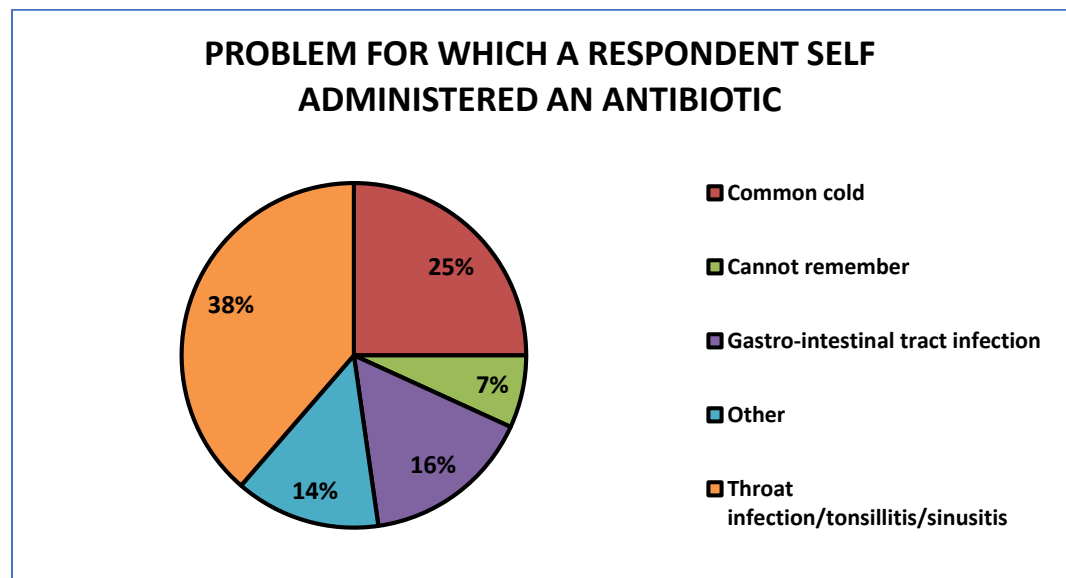


Figure 6.13: Problems responsible for self-administration of antibiotics

6.14 Last time when the respondent administered an antibiotic

A mighty percentage (31%) of respondents are not making a note of the problem for which they administered antibiotics

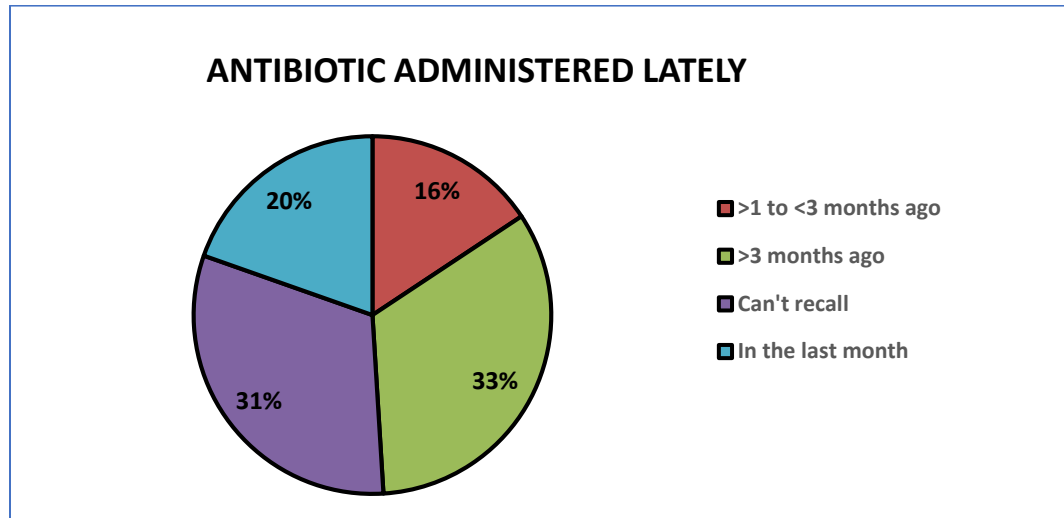


Figure 6.14: Antibiotics administered lately

6.15 Whether respondents stocked antibiotics

Most of the respondents do not stock antibiotics.

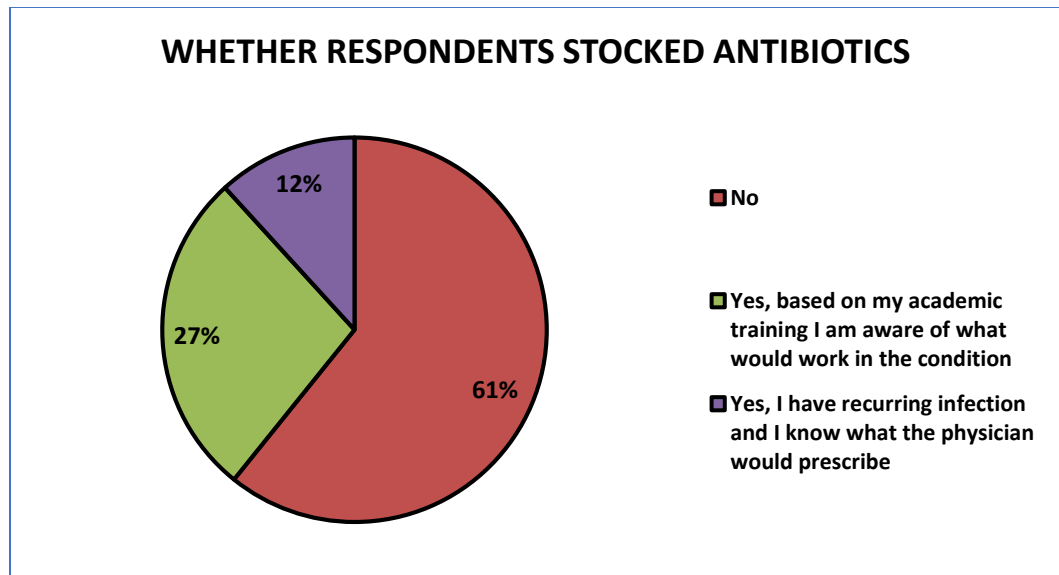


Figure 6.15: Whether respondents stocked antibiotics

6.16 Sources of obtaining the antibiotics for self-administration

Majority of the respondents obtained the antibiotics from pharmacy without prescription.

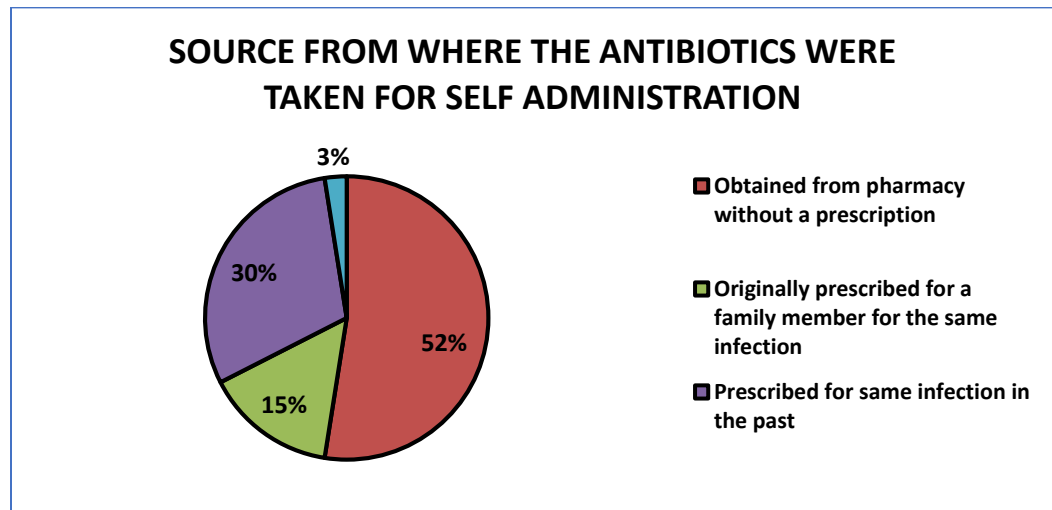


Figure 6.16: Sources of obtaining the antibiotics for self-administration

6.17 Whether the respondents completed last course of antibiotics as prescribed
Most of the respondents agree to have complied with the antibiotic course last prescribed.

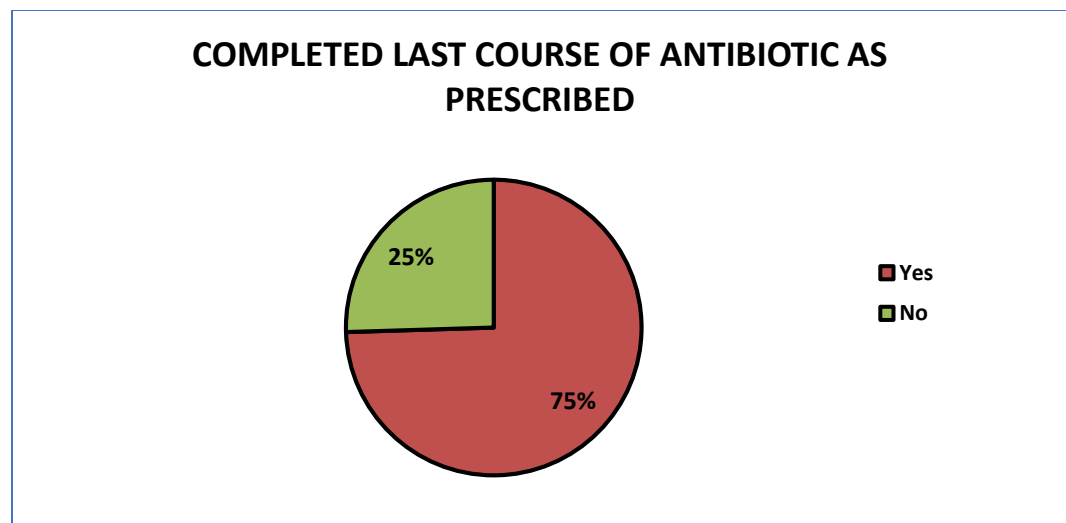


Figure 6.17: Whether the respondents completed last course of antibiotics as prescribed

	KNOWLEDGE OF ANTIBIOTICS			USE OF ANTIBIOTICS	
	antibiotics are not effective against virus	excessive use of antibiotics make them less effective over time	antibiotics are not effective against common cold	Did not completed last course of antibiotic as prescribed	self medication or administration of antibiotic without doctor's prescription
	71%	88%	57%	25%	61%
AWARENESS ABOUT ANTIBIOTIC RESISTANCE					
Yes (N=88)	88%			88%	

DISCUSSION AND CONCLUSION

- This study was conducted to assess the awareness, knowledge and compliance of prescribed antibiotic use among a set of employees working in a consulting firm based in Bangalore. Despite the fact 88% of the respondents stated they were aware of antibiotic resistance only 41% of them came across any antibiotic awareness campaign, results obtained through the survey implicate that not many of them are using antibiotics judiciously, which showed that many of the respondents were lacking adequate awareness regarding the proper use of antibiotics. This reflects that more antibiotic programs and campaigns are required in the society to educate people about the consequences of using antibiotics irrationally and without proper consultation by the physician.
- Actions of the respondents who end up taking antibiotics for viral infections, which are not treated by them, are driven by the prevailing myths regarding the antibiotics. As 47% of the respondents still expect them to be prescribed an antibiotic for cough/cold/sore throat, none of which is cured by an antibiotic. This also implies that even though most of the respondents agree to be aware of antibiotic resistance, many of them lack proper or have inadequate knowledge about their judicious use.
- A major chunk, as many as 31%, of the respondents cannot even recall as to when they administered an antibiotic lately. This implies that these people are not keeping a proper track of their antibiotic administration regime, which surely is one of the major reasons for antibiotic resistance.
- Just being aware about the term 'antibiotic resistance' does not mean that a person also has adequate knowledge about the rational use of antibiotics. The responses obtained through the survey floated implicate a different pattern of antibiotic use among respondents and it shows that even though they claim to be aware of antibiotic resistance, they lack proper and adequate knowledge about their judicious use.

- People should not be allowed to purchase antibiotics without prescription. Government should make stringent policies and should ensure proper implementation of the existing policies regarding the use of antibiotics to reduce irrational use and prevent over the counter selling of antibiotics.
- More number of antibiotic resistance campaigns should be introduced in the society to educate people about the ill effects and consequences of using antibiotics in an unjust manner.
- Government, healthcare professionals, pharmacists and other stakeholders should understand their role in reducing the antibiotic resistance by stepping up its efforts in increasing awareness among society about the proper use of antibiotics.
- People should consider it as their moral duty to use antibiotics in the prescribed manner and should comply to the dosage regimen associated with it.

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Appendix

Questionnaire used to conduct the survey:

QUESTIONNAIRE

1. What is the Age group in which you belong?
 - A) 21-25 yrs.
 - B) 26-30 yrs.
 - C) 31-35 yrs.
 - D) 36-40 yrs.
 - E) 41-45 yrs.
 - F) 46+ yrs.
2. What is your educational background?
 - A) Pharmaceutical sciences
 - B) Life sciences
 - C) Medical sciences
 - D) Engineering
 - E) Others
3. When you visit a physician for cough/cold/sore throat, do you wish/expect him to prescribe an antibiotic for faster recovery?
 - A) Yes
 - B) No
4. When was the last time you took antibiotic?
 - A) In the last month
 - B) >1 to <3 months ago
 - C) >3 months ago
 - D) Can't recall
5. Antibiotics are effective against bacteria and virus?
 - A) Agree
 - B) Disagree
 - C) Uncertain

6. Antibiotics are effective against common cold?
 - A) Agree
 - B) Disagree
 - C) uncertain
7. Can Bacteria can become resistant towards antibiotics?
 - A) Yes
 - B) No
 - C) Uncertain
8. Excessive use of antibiotics can make them less effective over time?
 - A) Yes
 - B) No
 - C) Uncertain
9. If you feel well halfway through the antibiotic course can you stop the treatment?
 - A) Yes
 - B) No
 - C) Uncertain
10. People can contribute to prevent antibiotic resistance in the community?
 - A) Yes
 - B) No
11. Did you complete the last course of antibiotics as prescribed?
 - A) Yes
 - B) No
12. If no, what were the possible reasons for not completing the course of antibiotics?
 - A) Felt better/ got well before finishing the course
 - B) Side effects
 - C) Forgot to take all doses
13. Have you self-medicated or taken antibiotics without a doctor's prescription?
 - A) Yes

- B) No
14. If yes, for what problem did you do so?
- A) Common cold
 - B) Throat infection/tonsillitis/sinusitis
 - C) Gastro-intestinal tract infection
 - D) Conjunctivitis
 - E) Other
 - F) Cannot remember
15. Where did you get the antibiotics from if you were not prescribed by a doctor?
- A) Prescribed for same infection in the past
 - B) Obtained from pharmacy without a prescription
 - C) Originally prescribed for a family member for the same infection
 - D) Originally prescribed for a family member/self for a different type of infection
16. Do you stock antibiotics?
- A) No
 - B) Yes, based on my academic training I am aware of what would work in the condition
 - C) Yes, I have recurring infection and I know what the physician would prescribe
17. Have you ever come across any antibiotic resistance campaign?
- A) Yes
 - B) No
 - C) Not sure what this is
18. If yes, where did you come across it?
- A) Hospital premises/Doctor's clinic
 - B) Workplace
 - C) University/college/school
 - D) Public place
 - E) Social media

F) Print media

G) Government health campaigns