Research Article

An observational study on awareness of antibiotics use among the general population

Sireesha Kalva*, Neha Andhi, Nihal Medipally

Sri Venkateshwara College of Pharmacy, Osmania University, Telangana 500081 India

Received: 2 May 2023 Revised: 24 June 2023 Accepted: 29 June 2023

Abstract

This study was designed to assess the awareness and knowledge of antibiotic usage and antibiotic resistance among the public. A population-based survey involving members of the public was conducted from October to February 2023. A structured questionnaire was developed to collect data from 110 respondents. Data were analyzed using the Google Forms application. The demographic data of respondents were analyzed using Google Forms software. A total of 110 respondents were initially invited to participate in this survey through social media. Out of these, 109 agreed to the invitation. 109 respondents out of 110 filled and returned the questionnaires representing a response rate of 99.1%. Among them, 66.6% were males while 39.4% were females, and they were widely distributed within age groups 19-27 years, 27-35 years, 36-44 years & 45-54 years, and 54-68 years. The respondents were grouped based on their level of education with high educational status recording the highest proportion. From the above survey, inappropriate and excessive use of antibiotics is a major factor contributing to emerging 'Antibiotics Resistance' this is due to the low level of knowledge of the respondents in the survey. This can be overcome by conducting healthcare campaign programs. Antibiotics continue to emerge as a serious threat to public health. From the above survey, it is evident that public awareness of antibiotics is incomplete. The majority of the public has knowledge of antibiotics and only a minor population lacks it. The awareness is also lacking in uneducated people rather than educated ones. It is very much necessary to educate people about the use of antibiotics by conducting campaigns at different socioeconomic levels of society. It is also important to create awareness about the dispensing of antibiotics at the pharmacy by the registered pharmacist which may help in controlling the spread of antibacterial resistance.

Keywords: Antibiotic, resistance, antibacterial resistance, public awareness, healthcare campaign

Introduction

The increasing rate of antibiotic resistance is a global public health crisis that has been identified as one of the greatest threats to human health worldwide (WHO GLASS report, 2002). Recent and inappropriate use of antibiotics are well-established risk factors for infection with resistant bacteria (Goldmann et al., 1996). Antibiotic resistance poses enormous challenges including longer hospital stays, higher mortality rate, a great economic burden and intangible costs (Ott et al., 2010; Raupach-Rosin et al., 2016). Past and current public health campaigns on antimicrobial resistance have echoed a key assumption in the so-called information deficit literature, that the two levels of public acceptance on proper use of antibiotics are the reflection of low levels of awareness of antibiotic use and knowledge about the possibly disastrous effects of improper use. This study is carried out in the sense that, there is still a great deficit in knowledge on the awareness on the dangers that comes with antibiotic misuse and its resistance (Sturgis and Allum, 2004). A study of 2010-2011 healthcare data identified that antibiotics were prescribed during 154 million ambulatory care visits in the United States, representing 12.6% of all ambulatory visits during the time frame (Fleming-Dutra et al.,2016).

More than 60% of prescribed antibiotics were broad-spectrum in nature and approximately 30% of all use was inappropriate. To slow the emergence of antibiotic

Address for Corresponding Author:
Sireesha Kalva
Associate Professor,
Department of Pharmacology,
Sri Venkateshwara College of Pharmacy, Osmania University, Telangana 500081 India
Email: sireesha.kalva@gmail.com

DOI: ttps://doi.org/10.31024/ajpp.2023.9.4.1

2455-2674/Copyright © 2023, N.S. Memorial Scientific Research and Education Society. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

resistance, judicious use of antibiotics is essential. The purpose of this survey is to assess knowledge and understanding of antibiotic resistance among the public and evaluate antibiotic use themes in association with understanding of antibiotic resistance.

Materials and methods

A cross-sectional survey design was used for this study. Respondents were reached through a formal electronic invitation in social media requesting them to participate in this survey. For those participants that were contacted electronically, their emails were obtained by mail. Upon accepting the invitation, the electronic questionnaire was sent to them for completion. Convenient sampling was employed for those whom we had their email addresses. The purposive sampling technique was adopted to ensure all participants who took part in the study fell within the age of 20 to 70 years. A structured graph was developed to collect data from a possible 100 respondents. Data were analysed through google forms and self- maintained records. Different information received from the survey was evaluated. A sample wise of 100 participants were chosen to respond and to fill in the electronic generated google form. It was circulated to 120 members of a known and unknown population.

The questionnaire was structured to facilitate self-administration by the public. The questionnaire was designed to assess individuals' knowledge on antibiotics, their resistance and deliberate behaviours by respondents regarding the prudent use of antibiotics. In total, the survey consisted of 22 questions, comprising 5- point Likert-type scales, multiple-choice and open questions, distributed over three sections. The first section is focused on a questionnaire of 'Antibiotics consumption'. Section two focused on the 'Source of antibiotics.' In the third section, we focused on 'Knowledge about antibiotics.'

In present study we assess the level of knowledge on the use, the side effects and antibiotic resistance. Although the data were not collected anonymously, we guaranteed complete confidentiality to each respondent. Regression analysis was performed according to respondents' attitude and general awareness on antibiotic resistance per knowledge level.

Results and discussion

From the figure 1, there are 109 members responses were received from different candidates of different age (20 to 70 years), sex (39.4% are female and 60.6% are males) and education qualification was from minimum to graduate and postgraduates. Although the data were not collected anonymously, we guaranteed complete confidentiality to each respondent.

The questionnaire was structured in three sections. The questionnaire was designed to assess individuals' knowledge on Antibiotics, their Resistance and deliberate behaviors by respondents regarding the prudent use of antibiotics.

Section I: ANTIBIOTICS CONSUMPTION

The figure 2 represents the information of intake of antibiotics. 81.7% people had used antibiotics whereas 20.2% people didn't use any antibiotics. This indicates that majority of the people consume antibiotics.

The figure 3(a) represents the percentage of antibiotic consumption of overall responses in their previous days. 49.5% of the total population had taken antibiotics more than twice, 25.7% of the total population had taken twice and 24.8% of the total population had taken once. Thus, we can interpret that majority of the people consumed antibiotics more than two times.

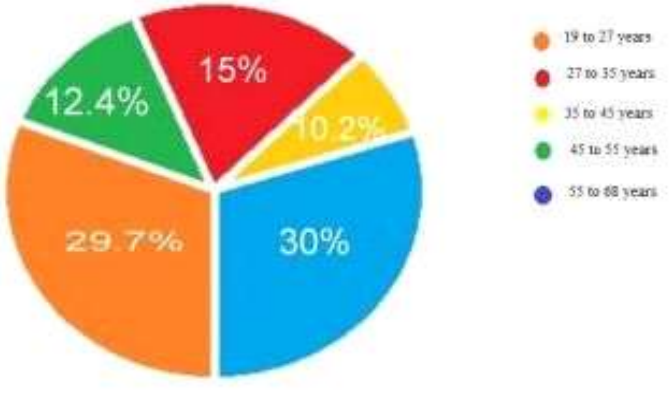

Figure 1: Pie chart representing Age of the respondents

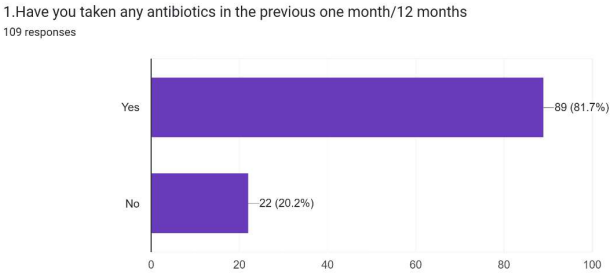

Figure 2: Graph representing antibiotics consumption previously

Section II. SOURCE OF ANTIBIOTIC

The figure 3(b) represents the percentage of antibiotics obtained from different areas. 70.6% of the population in the survey obtained antibiotics from retail pharmacy, 13.8% of the population obtained antibiotics from the traditional systems, 11% of the population obtained antibiotics from general store and the remaining population received free samples. Therefore, we can observe that retail pharmacy is the biggest source of antibiotics.

The figure 3(c) represents the percentage of antibiotics obtained by prescription or through self-knowledge. 72.5% of the population in the survey used antibiotics by physician's prescription, 19.3% of the population used antibiotics by their self-knowledge whereas 8.3% of the population used antibiotics which were prescribed by others. Thus, we can observe that, though majority of the people use antibiotics by physician's prescription, the rest of the population still use non-prescribed antibiotics which may lead to antibiotic resistance.

The graph figure 4(a) represents the percentage of people who read the label information on medications are 83[76.1%] to those who do not read the label information on the medications are 27[24.8%]. Thus, we can observe that 24.8% of the total population participated in the survey are not reading the label information on the antibiotics which may lead to adverse drug reactions.

The graphical figure 4(b) shows the percentage of people who can identify the names of antibiotics are 79[72.5%] to

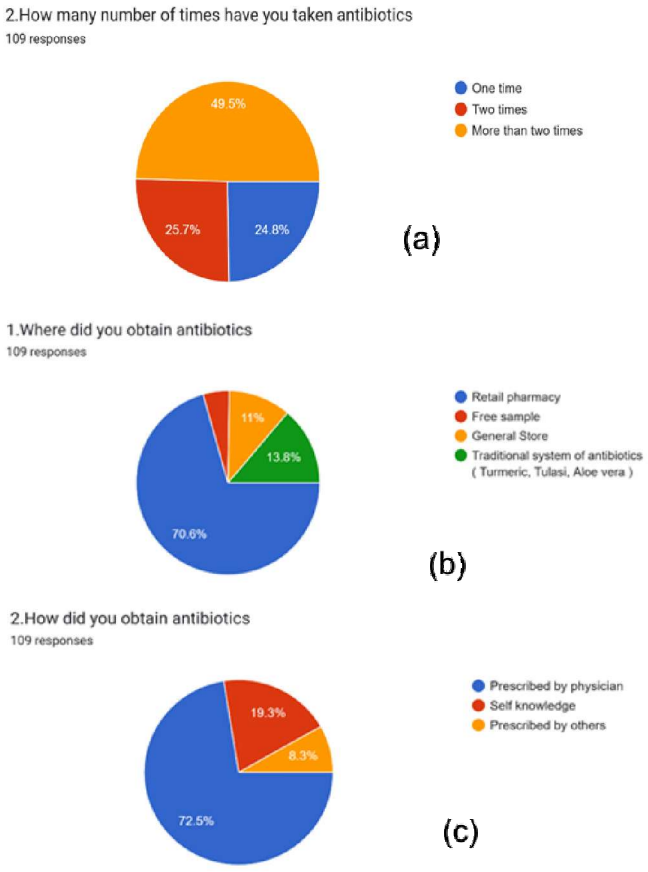

Figure 3: (a) Pie chart representing the count of antibiotics consumption, (b) Pie chart representing the source of antibiotics (c) Pie chart representing the prescription method of antibiotics

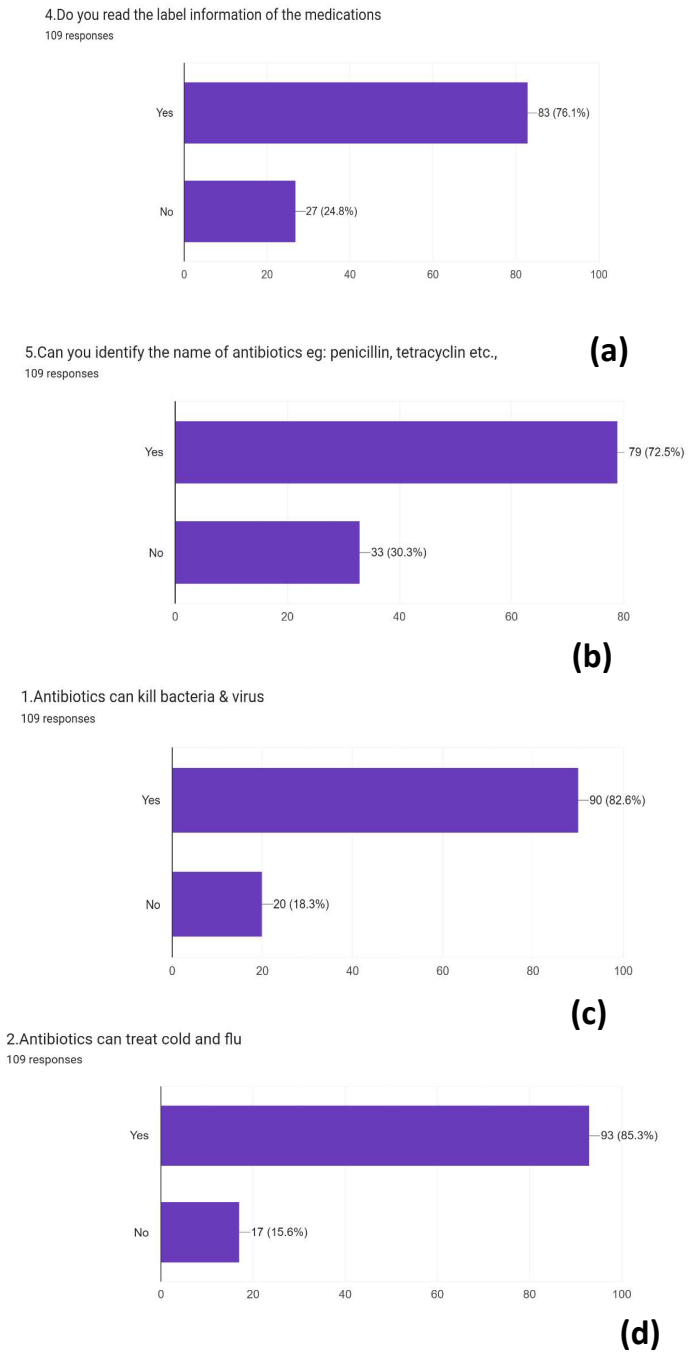

Figure 4: (a)Graph representing about the label of the medications, (b) Graph representing about the identification of antibiotics (c) Percentage of responses from all the respondents regarding the statement (d) Percentage of responses from all the respondents regarding the statement

those who can't identify them are 33[30.3%]. The maximum amount of population participated in the survey can identify the name of antibiotics by reading the label information on the medications.

Section III. KNOWLEDGE ABOUT ANTIBIOTICS

The questions in this section analyses how much knowledge about antibiotics dose people have.

The graphical figure 4(c) shows the percentage of people who agreed with the statement 'antibiotics can kill bacteria & viruses' are 90(82.6%) to those who did not agree 20(18.3%). Thus, we can observe that majority of the population is aware of the fact that antibiotics can kill bacteria and viruses.

The graphical figure 4(d) shows the percentage of people who agreed to the statement 'Antibiotics can treat cold and flu' are 93(85.3%) and those who did not agree are 17(15.6%). Most of the population believe that antibiotics can treat cold and flu and hence they consume them.

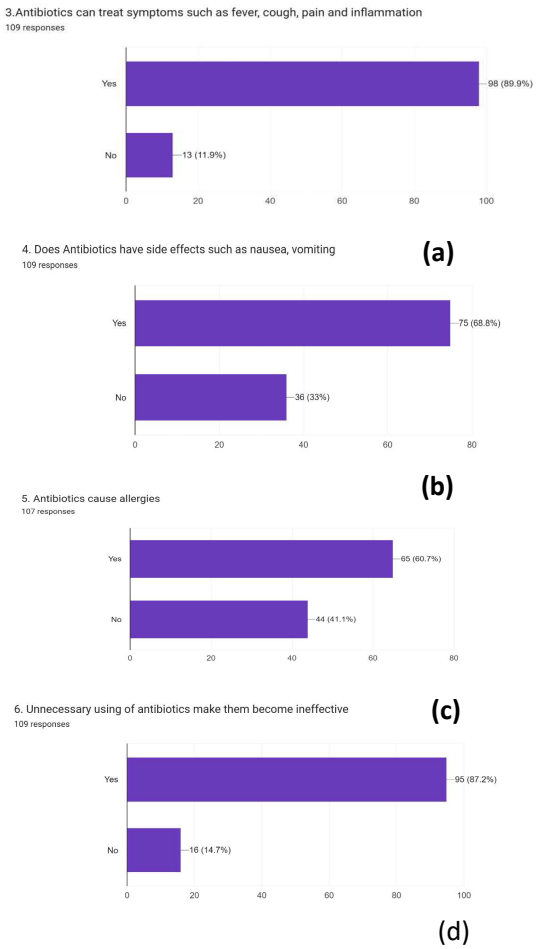

Figure 5: (a) Percentage of responses from all the respondents regarding the statement (b) Percentage of responses from all the respondents regarding the statement (c) Percentage of responses from all the respondents regarding the statement (d) Percentage of responses from all the respondents regarding the statement

The graphical figure 5(a) shows the percentage of people who agreed to the statement 'Antibiotics can treat symptoms such as fever, cough, pain, inflammation' are 98(89.9%) to those who did not agree are 13(11.9%). Majority of the population believe that antibiotics can treat symptoms such as fever, cough, pain and inflammation.

The graphical figure 5(b) shows the percentage of people who agreed 75(68.8%) to the statement 'Does Antibiotics have side effects such as nausea, vomiting' to those who did not agree 36(33%). Though antibiotics have side effects, people still prefer to use them.

The graphical figure 5(c) shows the percentage of people who agreed to the statement are 65(60.7%) 'Antibiotics cause allergies' to those who did not agree are 44(41.1%).

From the results obtained from above questions, we can observe that a minor population group have limited knowledge on Antibiotic and they use them irrationally which may cause and spread the resistance to the remaining population too.

The graphical figure 5(d) shows the percentage of people who agreed to the statement are 95(87.2%) 'Unnecessary using of Antibiotics make them became ineffective' to those who did not agree 16(14.7%). 87.2% of the total population agreed that they are not at risk of acquiring an Antibiotic resistant infection as long as they take Antibiotics correctly.

The figure 6(a) represents the percentage of responses

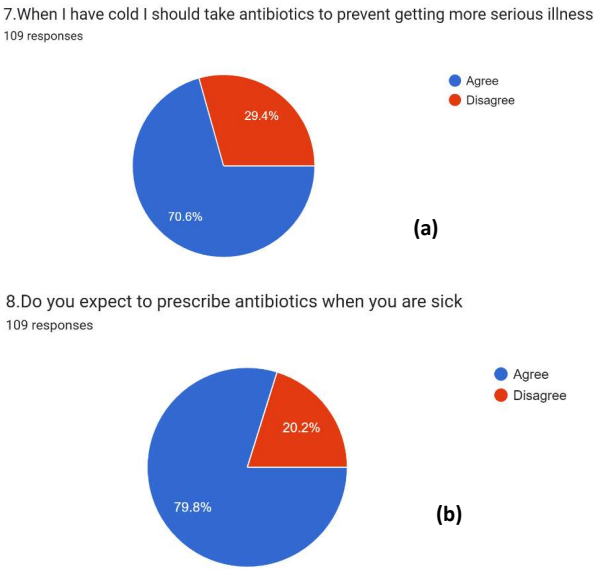

Figure 6: (a) Percentage of responses from all the respondents regarding the statement (b) Percentage of responses from all the respondents regarding the statement

(70.6%) who agreed for the statement 'Antibiotics should be taken to prevent getting more serious illnesses' to those who did not (29.4%). Most of the respondents have a misconception that taking antibiotics can cure common cold. But there is no cure for common cold, it will not get better by the use of antibiotics. Taking antibiotics in such cases may cause harm and it may lead to antibiotic resistance.

The figure 6(b) represents the percentage of responses on 'Do you expect to prescribe Antibiotics when you are sick' (79.8%) agreed & (20.2%) denied. Majority of the population in the survey expect to prescribe antibiotics when they are sick but only when it is prescribed by the doctor. Whereas minority in the population use antibiotics by their own, when they are sick.

The figure (7) depicts about the side effects faced by responders after intake of Antibiotics. We can see that antibiotics have several side effects such as headache, vomiting, nausea, allergy etc.

The figure 8(a) represents the percentage of antibiotics information obtained from different sources. 44% of the total population obtained it from physician, 22.9% from internet, 19.3% from family and friends whereas 13.8% obtained it from previous prescription. Most of the information about antibiotics is obtained from physician followed by internet, family and friends and previous prescription.

The graphical figure 8(b) shows the percentage of people accepted 70(64.2%) to the statement 'The above information that you obtained changed the use of Antibiotics' to those who did not accept 41(37.6%). Majority of the people changed the use of their antibiotics after obtaining information which may not be always from the right source. This may lead to development of resistance.

The graphical figure 9(a) shows the percentage of people who agreed to the statement 74(67.9%) 'Do you stop taking a full course of antibiotics if your symptoms are improved' to those who did not agree 35(32.1%). The usage of antibiotics should be stopped after improvement of symptoms to avoid the resistance development.

The graphical figure 9(b) shows the percentage of people who agreed with the statement are 61(56%) 'Do you share antibiotics from person to person, does anyone had experienced the same symptoms as you' to those who did not agree 50(45.9%). 56% of people agreed that they had shared antibiotics and this may lead to unwanted side effects.

The graphical figure 9(c) shows the percentage of people who agreed with the statement 57(52.3%) 'Do you keep left over antibiotics and use them in the future' to those who did not agree 52(47.7%). More than half of the population keep the leftover antibiotics and reuse them for different aliments without proper diagnosis. This could be alarmic reason for development of resistant strains of microorganisms.

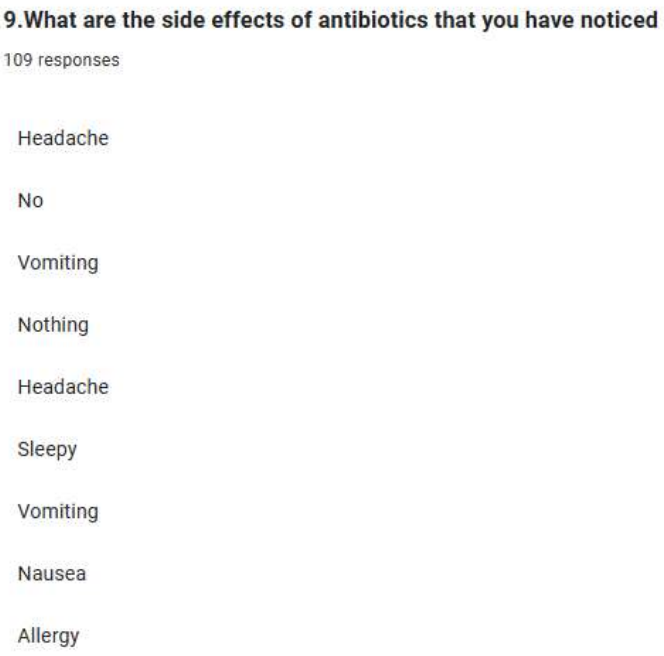

Figure 7: Side effects of antibiotics

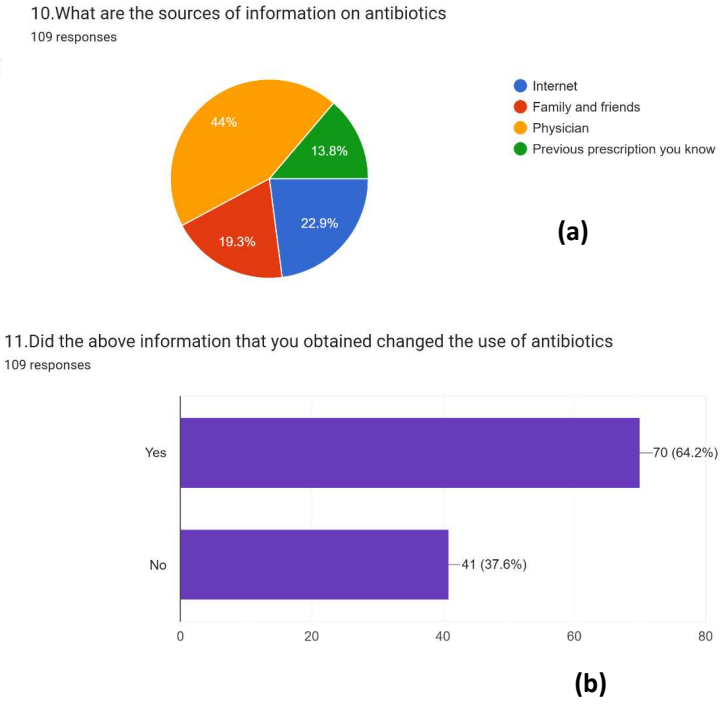

Figure 8: (a) Pie chart regarding the sources of information on antibiotics (b) Percentage of responses from all the respondents regarding the statement

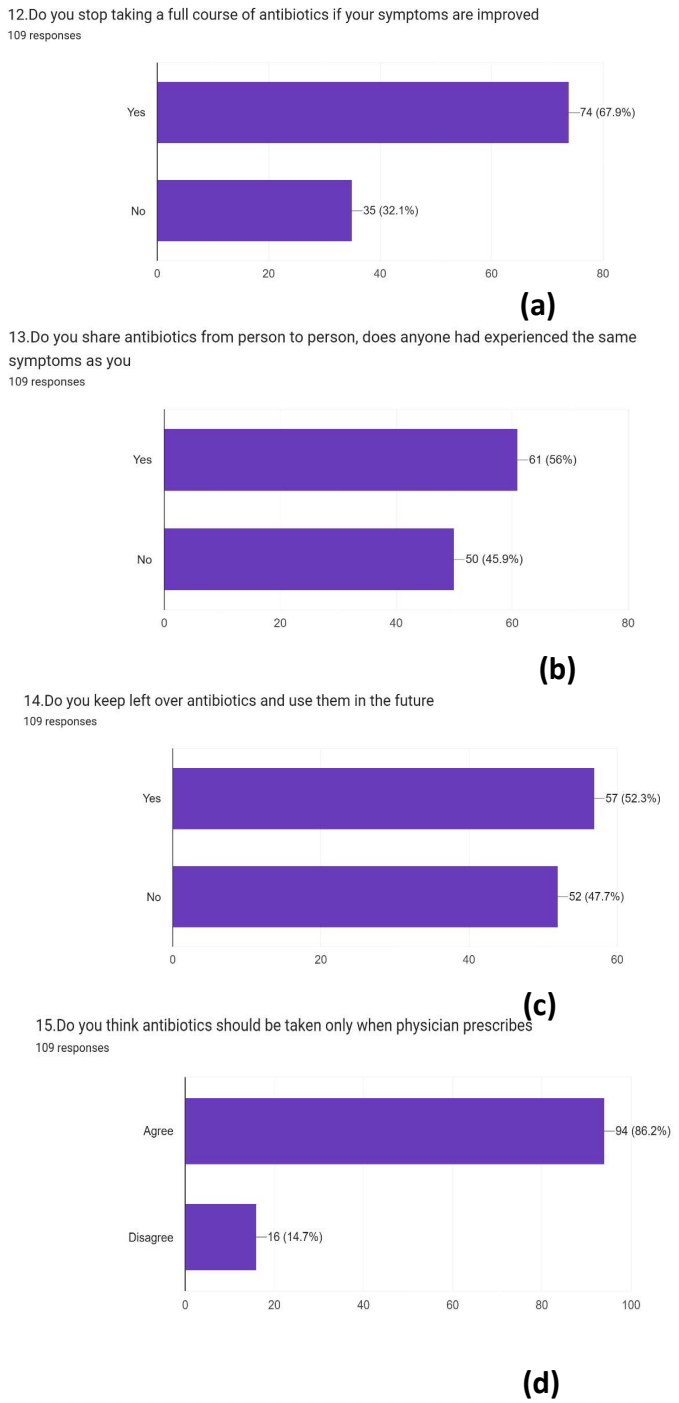

Figure 9: (a) Percentage of responses from all the respondents regarding the statement (b) Percentage of responses from all the respondents regarding the statement (c) Percentage of responses from all the respondents regarding the statement (d) Percentage of responses from all the respondents regarding the statement

From figure 9(d) 94(86.2%) of people agreed to the statement 'Do you think antibiotics should be taken only when physician prescribes' and 16(14.7%) did not agree Most of the population in the survey use antibiotics only when the physician prescribes them.

Conclusion

The threat of antimicrobial resistance is rapidly progressing and intensifying. The awareness on its seriousness and significance is the first step towards curtailing its progress.

Indiscriminate use of antibiotics has contributed to the progressive loss of bacterial sensitivity to antibiotics and spreading of resistant strains of bacteria, the clinical effectiveness of antibiotics depends partially on their correct use, depending on patients, physicians and retailers. From this survey it is observed that patient factors relating to incorrect antibiotic use include self-medication, sharing medication with other people, not taking of full course of treatment and keeping part of the course for another occasion. There is a need that public should be nurtured, that as prescribers, they are not only responsible for the benefits and welfare of their patients but also for the society at large in which press, media, and online discussion forums can be conducted.

References

Fleming-Dutra KE, Hersh AL, Shapiro DJ, Bartoces M, Enns EA, File TM Jr, Finkelstein JA, Gerber JS, Hyun DY, Linder JA, Lynfield R, Margolis DJ, May LS, Merenstein D, Metlay JP, Newland JG, Piccirillo JF, Roberts RM, Sanchez GV, Suda KJ, Thomas A, Woo TM, Zetts RM, Hicks LA. 2016. Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011. Journal of the American Medical Association (JAMA), 315(17): 1864-73.

Goldmann DA, Weinstein RA, Wenzel RP, Tablan OC, Duma RJ, Gaynes RP, Schlosser J, Martone WJ. 1996. Strategies to Prevent and Control the Emergence and Spread of Antimicrobial-Resistant Microorganisms in Hospitals. A challenge to hospital leadership. Journal of the American Medical Association (JAMA), 275(3): 234-40.

Ott E, Bange FC, Reichardt C, Graf K, Eckstein M, Schwab F, Chaberny IF. 2010. Costs of nosocomial pneumonia caused by meticillin-resistant Staphylococcus aureus. Journal of Hospital Infection, 76(4): 300-3.

Raupach-Rosin H, Rübsamen N, Szkopek S, Schmalz O, Karch A, Mikolajczyk R, Castell S. 2016. Care for MRSA carriers in the outpatient sector: a survey among MRSA carriers and physicians in two regions in Germany. BMC Infectious Diseases, 16: 184.

Sturgis P, Allum N. 2004. Science in Society: Re-Evaluating the Deficit Model of Public Attitudes. Public Understanding of Science, 13(1): 55–74.

World health organization global antimicrobial resistance and use surveillance system (GLASS) Report 2022. Centers for disease control, Antibiotic resistance threats in the United States. **ISBN:** 9789240062702