

Beyond The Clinic: an Investigation of Antibiotic Resistance Awareness Among Public

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ABSTRACT

Antibiotics, Antibiotic resistance, Antimicrobial resistance, Multidrug resistance, Stewardship. Antibiotic resistance is occurring everywhere in the world, compromising the treatment of infectious diseases and undermining many other advances in health and medicine. It represents one of the biggest threats to global health today, and can affect any one, of any age, in any country. It leads to longer hospital stays, higher medical costs and increased mortality. Antibiotic resistance occurs naturally, but misuse of antibiotics in humans and animals is accelerating the process. Tackling antibiotic resistance is a high priority for the World Health Organization (WHO). WHO is coordinating a global campaign to raise awareness and encourage best practices among the public, policymakers, health and agriculture professionals. This survey provides a snapshot of current public awareness and common behavior related to antibiotics in a range of countries. Our objectives include creating awareness among people about the antibiotic resistance, to analyze the problem of antibiotic resistance by conducting a survey among people and to find the possible solutions to overcome the problem of antibiotic resistance. This survey will provide an insight into the level of AMR awareness and antibiotic use in public. Through the response of 200 individuals, we can say that there is an overall poor understanding of antimicrobial resistance and/or improper use of antibiotics among the people

1. INTRODUCTION

Antibiotics are medicines used to treat bacterial infections. Due to misuse of antibiotics new resistance mechanisms are emerging globally and contributing to spread of new resistant strains of bacteria. It can occur naturally but misuse in humans and animals are accelerating the process leading to higher medical costs and increased mortality. Antibiotic resistance is a major threat to global health, food security and the economy. According to World Health Organization (WHO), it leads to the mortality of 25,000 people in European hospitals and greater mortality worldwide [1]. One of the major causes of the problem is the over-prescription of antibiotics by some healthcare professionals; sometimes even without standard treatment guidelines. Often, they do so to fulfill patient's expectations. Overuse of drugs by patients and lack of knowledge about antibiotics is also another prime cause of antibiotic resistance. Awareness of antibiotic resistance can greatly limit this problem. WHO has taken some initiatives to make people aware about antibiotic resistance by conducting World Antimicrobial Awareness Week (WAAW). Since 2015, it is held globally between 18 to 24 November every year. It aims to increase awareness of antimicrobial resistance and to encourage the best practices among people. This scheme gives a slogan – 'Antimicrobials: Handle with care' which was previously 'Antibiotics: Handle with care'. This change signifies broadening scope of drug resistant infections (WHO, 2020)

This study is done to evaluate knowledge of antibiotic resistance and antibiotic use among people. A survey was conducted among 200 people from different educational backgrounds and places.

2. III. OBJECTIVES

1. To analyze the problem of antibiotic resistance by conducting a survey among people.
2. To create awareness among people about antibiotic resistance.

3. IV. METHODOLOGY

The survey was conducted by using the platform - Google Forms. It was sent to a randomized group of people, all above the age of 18. 200 responses were recorded within a span of 24 hours then the form was closed. It was a population-based survey investigating knowledge of antibiotics or AMR among the general population. Individuals of all age groups above 18 participated in the survey, however majority of them were in the age group of 19-29. The individuals were from different educational backgrounds.

The questions asked were based on individual's antibiotic consumption, their use of antibiotics and their knowledge on the consumption and working of antibiotics in general. The question formats included multiple choice answers and agree/disagree type questions. The survey was anonymous, thus encouraging participants to be completely honest and unbiased.

The demographics considered for the survey were:

Gender: Male, Female, other

Age: 19-29, 30-39, 40-49, 50 and above

Educational Qualification: None, up to 12th grade, Bachelor's Degree, Master's Degree, Doctorate.

Educational Background

Results obtained were converted into graphs using Microsoft Excel and interpretation was done accordingly.

4. V. RESULTS

After conducting a survey, a total of 200 responses was received. 67.4% of the responses were from females and 32.6% responses were from males. The majority of the sample is from the age group of 19-29 (77.4%) followed by the age group of 30-39 (9.6%). Very few responses are from the 'above 50' age group. About 69.7% of participants have completed their bachelor's degrees and 20.7% have completed master's degrees. All the participants are educated. According to the profession, 58.3% belong to lifescience, 15.6% belong to engineering and 7.8% belong to the medical profession.

Use of Antibiotics- This section covers the part regarding when participants last took antibiotics and where they obtained them from [2].

According to the survey, majority of the people did not remember the time they had taken the antibiotics (33.8%). The people who had taken the antibiotics in last six months or 1 year comprise 26.3 % of the sample (Figure1). Majority of the people stop taking antibiotics once the prescribed course is over (74.4 %) and very few people (24.6%) stop taking antibiotics when they feel better (Figure 2). 93.8% off the sample population took antibiotics when prescribed by a doctor while 6.2% of them took recommendations from friends and family without consulting the doctor (Figure 3).

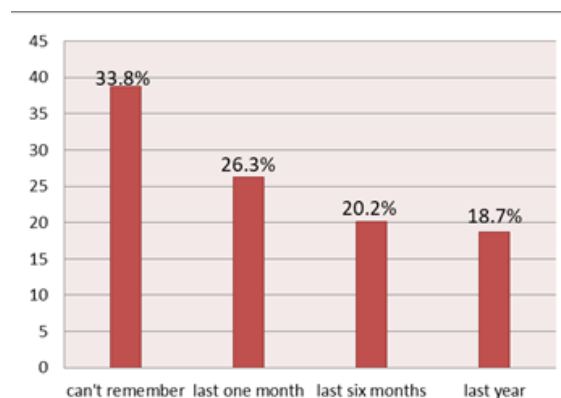


Fig 1.

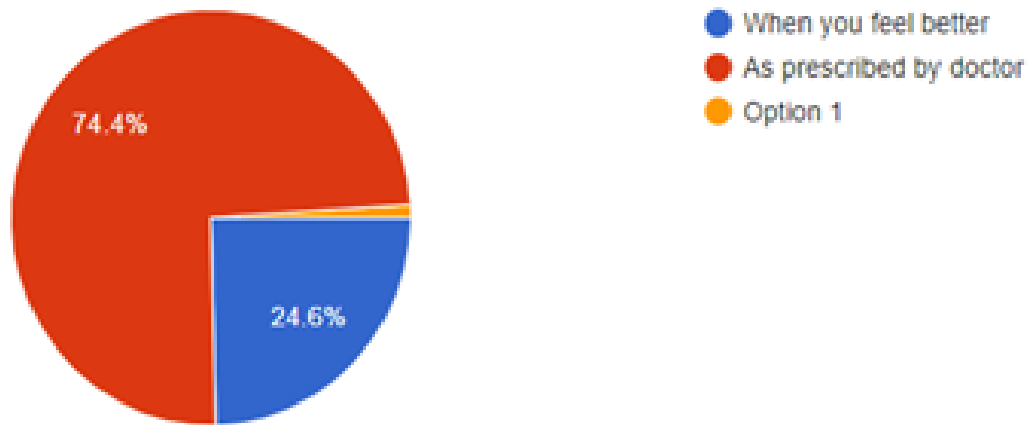


Fig 2.

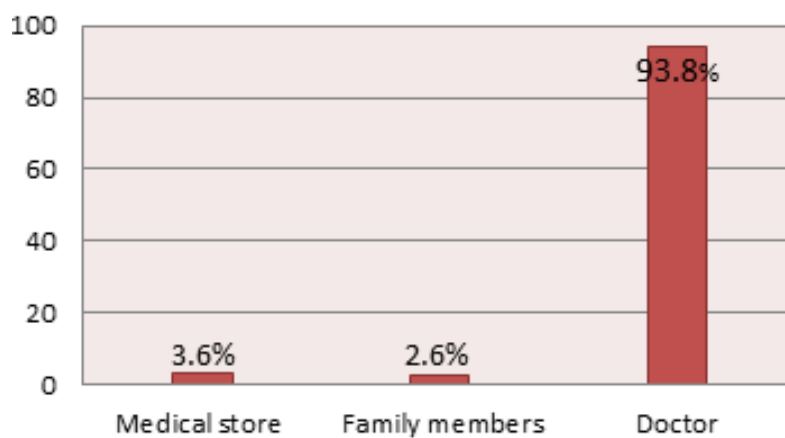


Fig 3.

Knowledge about antibiotics - This section covers use of antibiotics and the modes of taking them.

Participants have fair knowledge about antibiotics. Majority of the people (50.2%) are aware that antibiotics are used for treating bacterial infections. 38.9% of the participants believe that antibiotics can be used for treating all infections including viral and fungal infections (Figure 4). More than 90% of the people agree that they should consult a doctor before taking antibiotics while very few of them (8.2%) are not sure whether or not they should consult the doctor before taking antibiotics (Figure 5).

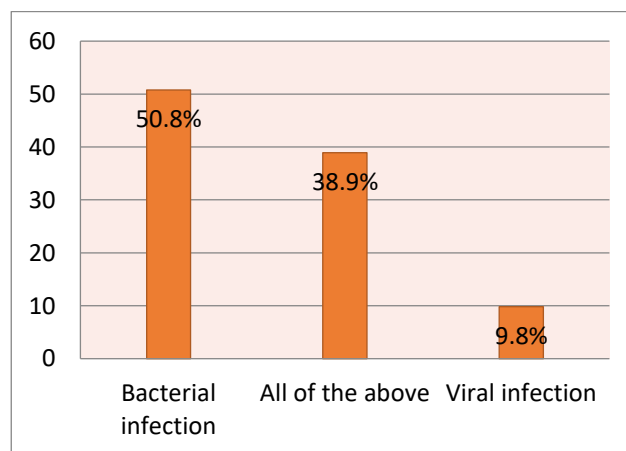


Fig 4.

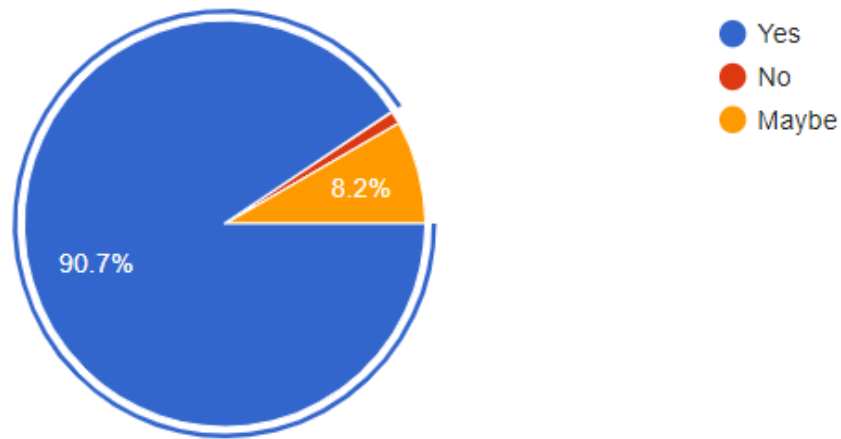


Fig 5.

Attitude towards antibiotics –

According to the survey, 54.6% of the individuals don't take over the counter antibiotics when they have just a cough or sore throat. 27.3% of the individuals however, do take antibiotics over the counter (Figure 6). Moreover, 53.9% of participants do not go for further doses of antibiotics if the disease is not cured while 25.1% go for further doses of antibiotics for curing the disease (Figure 7).

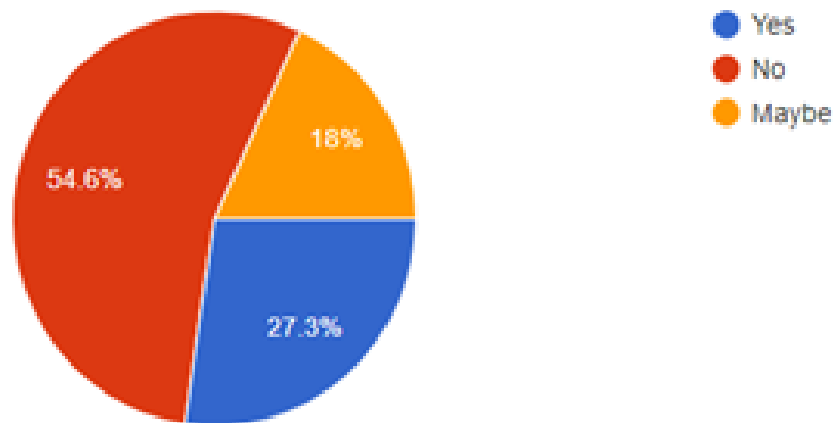


Fig 6.

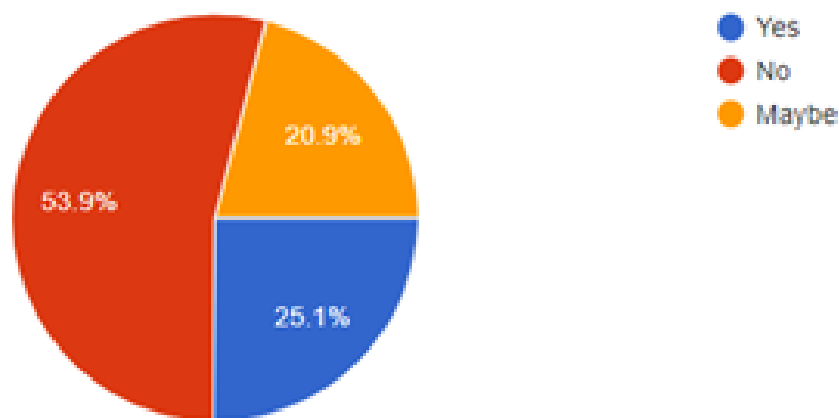


Fig 7.

About 44% of people disagree that antibiotics should be commonly used while 11% people agree and the remaining (45%) are neutral (Figure 8).

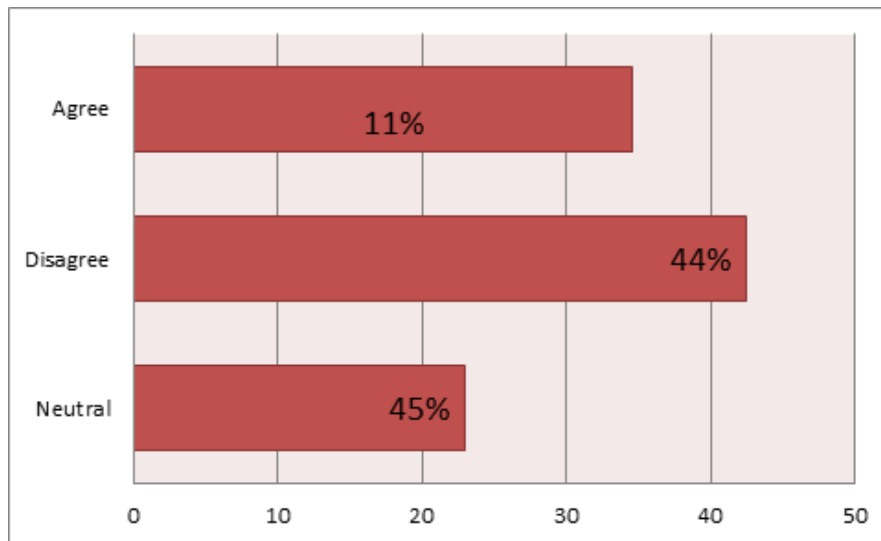


Fig 8.

“It’s okay to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness. What is your opinion about the statement?”

According to the survey, 77% of individuals think that the above statement is false and 23% think that the statement is true (Figure 9).

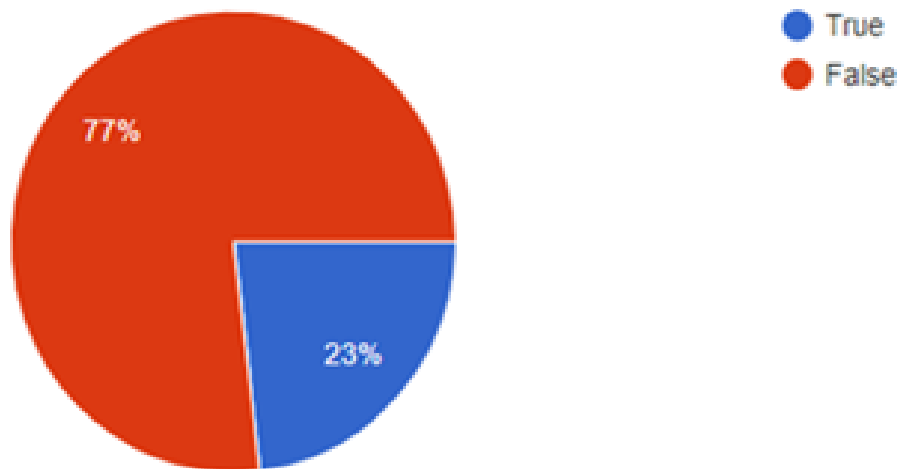


Fig 9.

Knowledge on antibiotic resistance – This section covers the knowledge of the general public on the causes and measures required to address the problem of antibiotic resistance [3].

According to the survey, majority (71.4%) of the people have knowledge regarding antibiotic resistance while 13% of them are not aware of it (Figure 10). 94.2% of the respondents have correctly identified “Bacteria could become resistant to antibiotics” as a true statement while only 5.8% think that it is a false statement (Figure11).

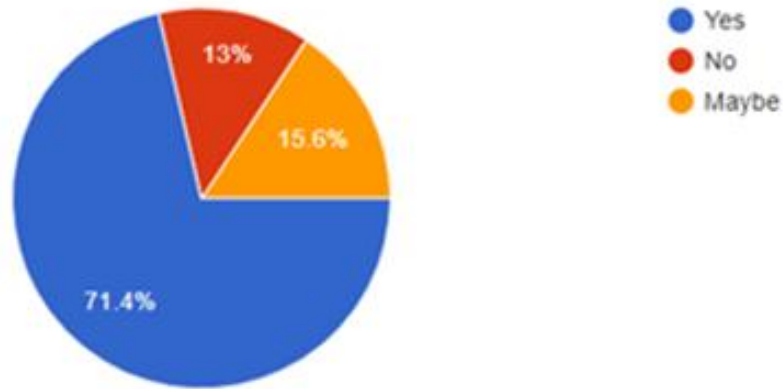


Fig 10.

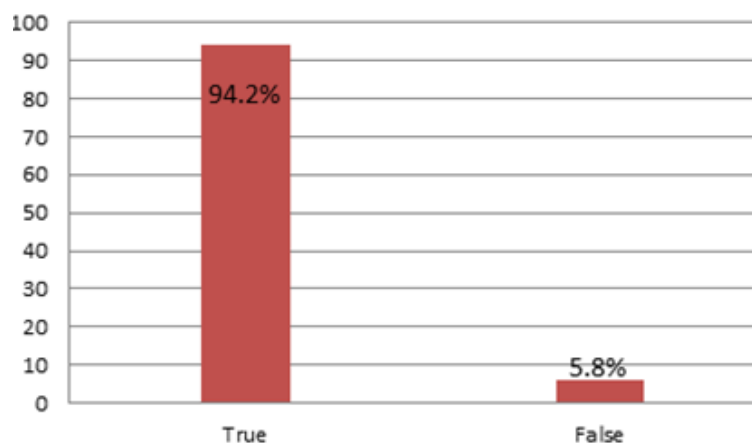


Fig 11.

According to the survey, 42.4% of the people disagree that skipping one or more doses of antibiotics does not contribute to the development of antibiotic resistance while 23% agree that skipping doses does contribute to the development of antibiotic resistance (Figure 12).

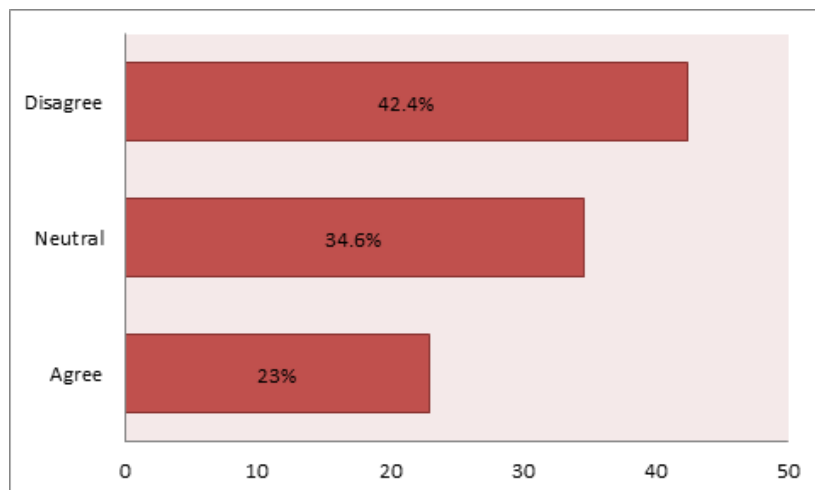


Fig 12.

Q) What are main causes of antibiotic resistance?

Options: A) Over prescription of antibiotics

B) Not finishing the entire course

C) Poor hygiene

D) All of the above

According to the survey, 45.2% of the participants agree that all of the above reasons are responsible for antibiotic resistance while 27.1% think that over prescription of antibiotics is the major cause of antibiotic resistance. 27.6% of the people think that poor hygiene and not finishing the entire antibiotic course are causes for antibiotic resistance (Fig 13).

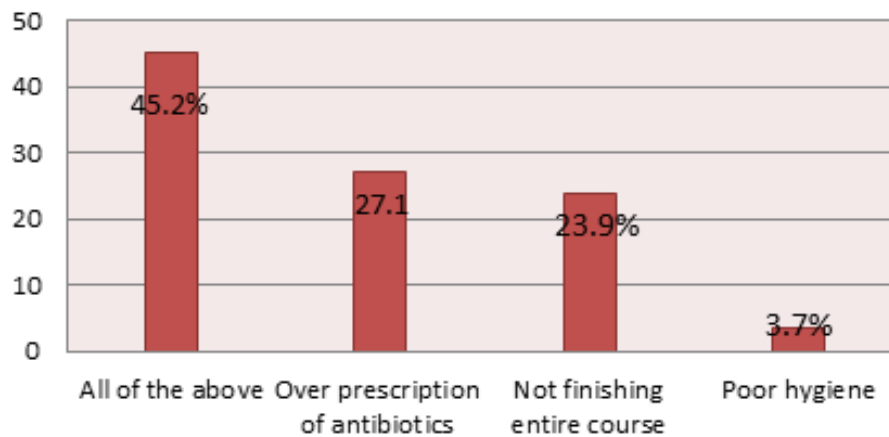


Fig 13.

Q) Antibiotic-resistant bacteria can spread to humans through which mode?

According to the survey, 19.9% of people think that antibiotic resistant bacteria can spread through contact with live animals, food or water carrying antibiotic resistant bacteria, 17.1% people think it can spread by coming in contact with the person who is having an antibiotic resistant infection and 55.8% have correctly identified that all of the above options are responsible for spread of antibiotic resistant infections (Figure 14).

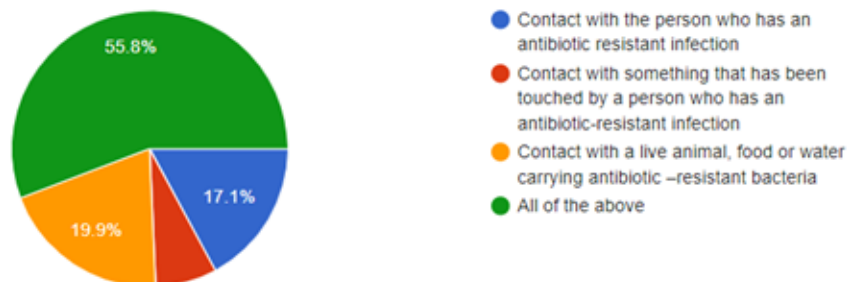


Fig 14.

Q) What happens if I get an antibiotic resistant infection?

According to the survey, 22.6% people think that they should visit a doctor and 17.7% think that they will get sick for long period of time or they will have to buy expensive medicines. Majority of them (59.7%) think that all of the options can be considered if they get antibiotic resistant infection (Figure 15).



Fig 15.

Q) What are the series of actions that can be taken to address the problem of antibiotic resistance?

According to the survey, 27.6% participants believe that use of antibiotics only when prescribed and always taking the full prescription is the solution for addressing the problem of antibiotic resistance and most of the participants (56.2%) correctly identified that all of the options are solutions for treating antibiotic resistance (Figure 16).

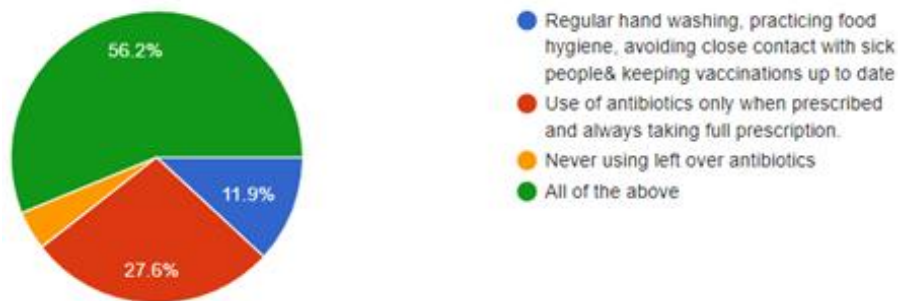


Fig 16.

Q) “Taking antibiotics only when they are needed is an important way to protect yourself and your family from antibiotic resistance”. What is your opinion about the statement?

According to the survey, (95.8%) respondents correctly identified that “Taking antibiotics only when they are needed is an important way to protect yourself and your family from antibiotic resistance” as a true statement while only (4.2%) think that it is a false statement (Figure 17).

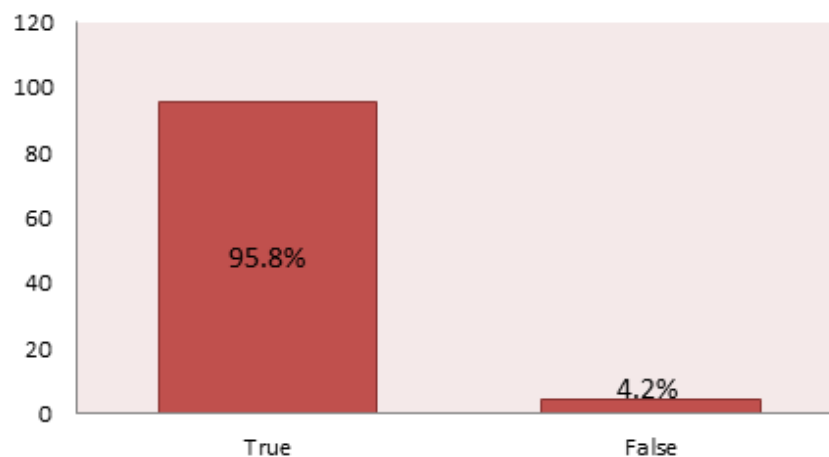


Fig 17.

Knowledge on antibiotic stewardship – According to the survey, 68.6% people are not aware about antibiotic stewardship while only 26.1% are aware about it and very few (5.3%) are not sure (Figure 18). Most of them (61.3%) are unaware about World Antimicrobial Awareness Week and very few of them (38.7%) people are aware about the same. Thus, there is need

to spread awareness among people [7]. (Figure19).

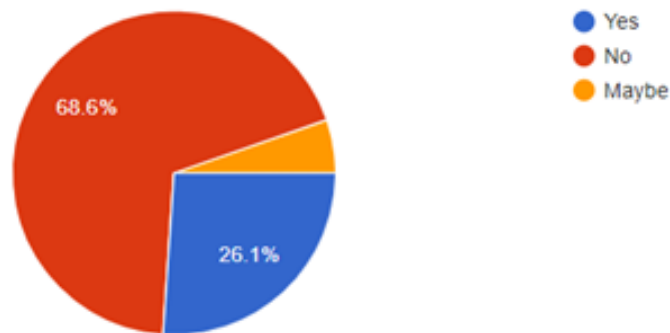


Fig 18.

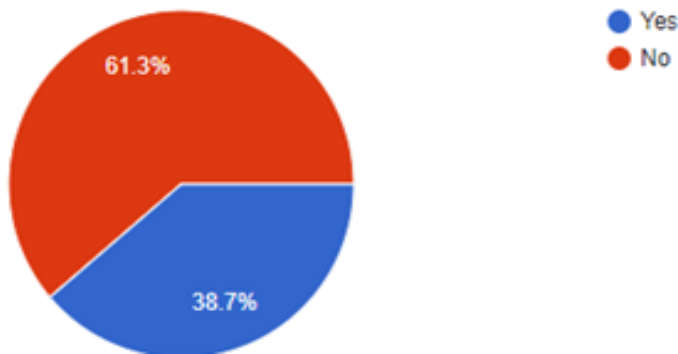


Fig 19.

5. VI. DISCUSSION

In this study, the results of the survey indicate that there is awareness about antibiotic use and AMR among the general population. There are problems with antibiotic use and it has been a major contribution towards antibiotic resistance. To overcome this problem, it is necessary to take antibiotics within a specified time as prescribed. The results of this survey on antibiotic use demonstrate how frequently antibiotics are taken, with a considerable number of respondents (38.9%) confirming the consumption of antibiotics within the last 6 months or year. Attention should be given to the need of antibiotics i.e. whether or not it is really necessary to take them. According to the survey, most of the people (93.8 %) were recommended by doctors to take antibiotics while the rest of the people (6.2 %) had obtained antibiotics from relatives without any checkup by a physician. So, keeping the left-over antibiotics results in poor compliance with antibiotic therapy which contributes to antibiotic resistance. Also, there are people who think antibiotics can be used for treating all infections including viral and fungal infections. Therefore, it is necessary to spread awareness that antibiotics can treat only bacterial infections [4] and not viral or fungal. Some people believe that skipping one or more doses of antibiotics does not contribute to the development of antibiotic resistance while few of them agree that skipping doses does contribute to it. To change the practice of inappropriate use of antibiotics by the general public, it is necessary to have strategies or policies made to control this problem. According to the WHO, when a patient stops the intake of antibiotics too early, it favors the bacterial strains that have some natural intrinsic resistance. It is therefore advisable that patients always take the full course of antibiotics prescribed to them by a certified health professional. Secondly, leftover antibiotics may not be the right drug for new infections as different infections require different antibiotics. Lastly, to treat any infection, one requires a particular amount of drug for the treatment duration. Therefore, if there is any leftover antibiotic, it may be insufficient for treatment hence the surviving bacteria can proliferate which may lead to antibiotic resistance [5].

The results of this study reveal that, respondents from different backgrounds report that they have some general awareness about antibiotic resistance [6]. It should be noted that, antibiotic-resistant bacteria can spread from person to person, with the

potential to affect anyone, of any age and in any country [7]. Also, people agree that antibiotics should not be commonly used and the more the antibiotics are used in a society, the higher is the risk that resistance develops and spreads. The current results are in favor to a study by McNulty et al, whose results have suggested that there is a need to improve the status quo because there is still need of some minimal improvement in the knowledge level of the general public on the antibiotic resistance [8]. From our survey, it can be deduced that individuals having a life sciences background have a greater knowledge about antibiotic use and antibiotic resistance in the multivariable analysis. The strength of this study is that it focuses on evaluation of questionnaire which contributes to the knowledge and awareness of both antibiotic use and AMR. Our findings may provide a repository of data which can help to shape policies while addressing this problem. However, there are some limitations; there is a possible bias towards the participants who may have a fair knowledge on the subject matter. Also, some questions were left unanswered by the participants maybe because of lack of knowledge while some participants could also have selected the most favorable answer just to attempt the question.

6. VII. CONCLUSION

This survey provides an understanding about the level of AMR awareness and antibiotic use in the public by responses collected from 200 individuals. Our findings show that about 90% of the public take antibiotics as per recommendations of doctors, almost 75% of people stop taking antibiotics as prescribed by the doctors and 70% people agreed to having the knowledge about antimicrobial resistance. In case if the disease is not cured with the doctor's prescribed course of antibiotics, more than 50% of people do not go for further doses of antibiotics. About 80% of the people think that they need to visit the doctor more often, 70% people think that they will get sick for long period of time while 60% people think that they will have to buy expensive medicines if they get an antibiotic resistant infection. Thus, these sort of misconceptions among the people is the main reason for moderate understanding of antimicrobial resistance and/or improper use of antibiotics among respondents. It is irrespective of social contexts like gender, age and education [9]. It is critical to know that people from the life-sciences field understand the problem of AMR better and can spread the awareness on an individual level. Although, many programs are carried out to increase awareness about AMR, the risk of AMR is rapidly increasing and thus there is need to create greater awareness among the people before it is too late.

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