*IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*
*e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 23, Issue 5 Ser. 5 (May. 2024), PP 48-58*
*www.iosrjournals.org*

# Awareness of Antibiotic Use among the Rural People of Raicho Village in Cumilla

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***ABSTRACT***
***Background****: An antibiotic is a sort of antimicrobial chemical that works against bacteria. It is the most significant form of antimicrobial agent for combating bacterial infections, and antibiotics are commonly used to treat and prevent such diseases. They can either kill or inhibit the growth of bacteria.*
***Objective****: To assess the awareness of antibiotic use among the rural people of Raicho village in Cumilla.*
***Methods****: A Cross sectional study was carried out at Raicho village, Cumilla, Bangladesh, during the study period of one day (09-09-2023). A total 30 sample was purposively selected. Statistical analyses of the results were be obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-24).*
***Results****: The most common age group of antibiotic consumers was 31-40 years (43.33%). The majority of the patient were males 76.66%. Antibiotic therapy used on a doctor's prescription has the largest distribution in the research population (40%) followed by medication shopkeepers' recommendations (30%). Furthermore, the study population's highest distribution of antibiotic use was attributed to fever and sore throat (46.66%), followed by the common cold (43.33%).*
***Conclusion:*** *Antibiotics are ineffective against viruses like the common cold or influenza; medications that block viruses are referred to as antivirals. Lack of information about antibiotic use and prescribing methods, as well as patients who do not adhere to their treatment plan, all contribute. As a result, knowledge and awareness about the appropriate use of antibiotics is required.*

## I. INTRODUCTION

Antibiotics are chemicals produced by microbes that inhibit the growth or kill other germs at extremely low doses. Antimicrobial agents refer to both synthetic and naturally derived medications (Katzung, 2012). Antibiotics are currently the most often administered medications in hospitals globally, and they effectively increase life expectancy (Datta et al. 2016). Antibiotics are prescribed to prevent and cure bacterial illnesses. Infections are the leading cause of a condition's bad prognosis; thus, appropriate infection control can prevent certain co-morbid or morbid circumstances. Antibiotics have two sides, just as a coin does. The first is infection control, and the second is organismal resistance (Gowthami and Spurthi, 2016).

Antibiotic prescriptions are typically based on empirical evidence and are broad-spectrum in nature. This is determined by the interplay of knowledge, prescriber and patient expectations, economic incentives, a country's health-care system characteristics, and regulatory authorities. Patient-related factors that contribute to improper antibiotic use include drug beliefs and perceptions, as well as noncompliance with therapy. Furthermore, insufficient education, the absence of guidelines, a lack of resources, inadequate training, patient load, and drug inaccessibility can all contribute to illogical antibiotic use. Inappropriate antibiotic use causes undesirable medication effects, increases costs, increases mortality and morbidity, and promotes the evolution of resistance (Getachew et al. 2013; Khan et al. 2013).

Antibiotics have been utilized since antiquity. Penicillin was widely used at the time and proven to be quite useful. However, antibiotics' efficiency and ease of use have resulted in abuse, and some bacteria have

developed resistance to them (Laxminarayan et al. 2013). The World Health Organization has classed antimicrobial resistance as a widespread dangerous concern that is no longer a future prediction; it is occurring right now in every region of the world and has the potential to affect anyone, at any age, in any country (WHO, 2014).

Antibiotic resistance is a global danger that poses the greatest barrier to effective infection treatment. In order to control this condition, awareness of use should be enhanced, as should rapidly action to address the threat (Ventola, 2015). Resistance has a negative impact on both clinical and financial outcomes, including the failure of an individual patient to respond to therapy, the need for expensive and/or toxic alternative drugs, an increase in social cost, a longer duration of hospitalization, and the need for changes in empirical therapy (Bisht, 2009).

Knowledge of antibiotic consumption patterns is required for a constructive solution to difficulties resulting from multiple antibiotic usages. It is critical that institutions and hospitals have antibiotic policies in place to guarantee that individual prescribers make the best decisions (Remesh et al. 2013). Prescriptions at health institutions are critical components in designing programs to encourage effective antibiotic usage, infection control, and cost containment (Badar and Navale, 2012). Physicians should be more professional and cautious when prescription pharmaceuticals, and the Bangladeshi government should implement effective methods to encourage prudent drug usage. However, this type of study could be viewed as an attempt to improve the quality of service in Bangladesh's health-care system (Datta et al. 2016). The information that we have gathered in this study will help us understand behavioral pattern of rural people of Raicho village in respect to use of antibiotic. Consequence of misuse of antibiotic and knowledge about antimicrobial resistance are also identified, so that probable solutions can also be found and recommendation can be given.

## II. DEFINITION OF THE KEY TERMS

**Limited Awareness:** Rural populations often have limited access to healthcare services and may not receive adequate education about the appropriate use of antibiotics. This lack of awareness can lead to improper use, such as not completing a full course of antibiotics or using them for viral infections where they are ineffective.

**Impact of Misuse:** Misuse of antibiotics can result in antibiotic-resistant bacteria, which pose a significant public health threat. These resistant bacteria can spread within communities and healthcare settings, making infections more difficult and expensive to treat.

**Cultural and Social Factors:** Cultural beliefs and practices may influence the use of antibiotics in rural areas. Traditional remedies and home remedies are sometimes preferred over conventional medical treatments, leading to delays in seeking appropriate care.

**Healthcare Access:** Limited access to healthcare facilities and trained healthcare providers in rural areas can contribute to inappropriate antibiotic use. People may rely on self-medication or advice from non-medical sources, increasing the risk of misuse.

**Education and Awareness Programs:** Efforts to improve awareness of antibiotic use and resistance are essential in rural communities. Community outreach programs, educational campaigns, and training for healthcare providers can help raise awareness and promote responsible antibiotic use.

**Policy and Regulation:** Government policies and regulations play a crucial role in addressing antibiotic misuse. Implementing regulations on antibiotic prescribing and dispensing, as well as promoting antimicrobial stewardship programs, can help combat antibiotic resistance in rural areas.

**Collaboration and Partnerships:** Collaboration between healthcare providers, community leaders, and policymakers is essential to develop and implement effective strategies to improve antibiotic use practices in rural communities.

## III. OBJECTIVES

**General objective:**
To explore the awareness of antibiotic use among the rural people of Raicho Village.

**Specific objectives:**
To assess the socio-economic background of the respondents.

To analysis the particular pattern, knowledge of antibiotic use.
To explore the factors for discontinuation of antibiotic therapy and
To give some recommendations to increase awareness of antibiotic use.

**JUSTIFICATION OF THE STUDY**

The study on "Awareness of Antibiotic Use Among the Rural People" aimed to evaluate the knowledge and practices related to antibiotic use in rural communities. The findings revealed that there was a lack of awareness and understanding among rural residents regarding the appropriate use of antibiotics. Many participants were found to misuse antibiotics, either by self-prescribing them without medical consultation or by not completing the full course as prescribed. Furthermore, there was a notable absence of knowledge about antibiotic resistance, its causes, and implications. This lack of awareness poses significant public health risks, as misuse and overuse of antibiotics contribute to the development of antibiotic-resistant bacteria, making infections harder to treat and potentially leading to severe health complications. The study emphasizes the need for targeted educational programs and interventions to improve antibiotic stewardship and raise awareness about the proper use of antibiotics in rural communities.

## IV. REVIEW OF LITERATURE

Antibiotics are drugs that have saved and continue to save hundreds of thousands of lives each year. On the other hand, "antibiotic resistance" is a severe and one of the most alarming healthcare concerns in the world (Lupo et al. 2012). There are two ideas, both of which have sufficient evidence to explain the cause of the current antibiotic resistance problem. While the first hypothesis states that resistance is an ancient and genetically rich natural occurrence, the second hypothesis claims that widespread antibiotic resistance is a recent phenomenon tied to human medication usage. However, whether it is a modern or ancient phenomena, it is clear that low-cost medications, prophylactic therapy with broad-spectrum antibiotics, and excessive use of these drugs all contribute considerably to the emergence of bacterial drug resistance (Depledge, 2011; Bisht et al. 2009).

Antibiotics are used irrationally in Bangladesh, as in many other developing countries, due to their broad availability, leading in inappropriate use and a steady growth in antibiotic resistance (Radyowijati and Haak 2003). As a Third World country, the vast majority of the population lives in poverty. People are urged to purchase pharmaceuticals from illegal dealers because drugs are frequently unavailable in government hospitals. Furthermore, many people, particularly the poor, rely heavily on informal healthcare providers, who are not equipped to deliver adequate health care to the community (Ahmed and Hossain, 2007). Patients do, however, have access to non-prescription medications, such as nutritional supplements and over-the-counter (OTC) drugs, as well as prescription products.

Antimicrobial resistance (AMR) is a major global public health issue that is linked to increased antibiotic use (Costelloe et al. 2010). Inappropriate and excessive antibiotic use raises healthcare expenses and causes unwanted side effects. Despite attempts to promote sensible antibiotic usage as part of antimicrobial resistance measures, global antibiotic use increased by 40% between 2000 and 2010. Brazil, Russia, India, and China (BRIC economies) and South Africa accounted for three-quarters of the growth (O'neill, 2014).

According to recent studies, antibiotic use among outpatients in Chinese hospitals can reach 50%. This level of antibiotic use is significantly greater than WHO recommendations and that of many other nations (WHO, 2006). Antibiotic misuse has been reported to be especially prevalent in rural China, with over 70% of antibiotics prescribed for the common cold in village clinics and approximately 40% in urban areas, with prescription rates highest for upper respiratory tract infections (Yin, 2009). China lags behind countries like the US and UK in promoting antibiotic-related education and responsible use. The majority of activities in China have concentrated on stewardship initiatives and laws, as well as clinician training and support (He et al. 2019). In 2004, the Chinese government developed a statewide Special Antimicrobial Use Rectification Program, which involves AMR surveillance and antibiotic stewardship activities in secondary and tertiary hospitals, resulting in reduced antibiotic prescribing. Antibiotic overuse continues to be an issue in primary care settings and rural populations (Wang et al. 2014).

The emergence of drug-resistant microbes is a challenge to modern medicine. Antimicrobial resistance is a natural phenomenon that worsens with antimicrobial exposure (Andersson & Hughes, 2014). In Germany, ambulatory care accounts for around 75% of all antibiotic prescriptions, with the majority being used for respiratory tract infections caused primarily by viruses and urinary tract infections (Mölstad et al. 2002). Antibiotic-resistant bacteria are more common in areas with increased outpatient care usage. Antibiotic use in

primary care has been largely consistent in recent years, with basic penicillins being used less and reserve antibiotics being used more (Cockburn and Pit, 1997). Many primary care physicians feel pressured by their patients to prescribe antibiotics for infections that do not necessitate antibiotics, i.e., patients who are unaware of the distinction between viral and bacterial infections, such as influenza, colds, or sore throats (Mehta et al. 2017). In Europe, as in Germany, general community knowledge of antibiotic mode of action is poor. Furthermore, the benefits of antibiotic therapy are frequently overstated in comparison to the drawbacks for individuals with an acute infection. "Antibiotics might not make me better, but I should take them just in case" (Broniatowski et al. 2015). Over the last few years, health literacy has gained prominence in the literature as a critical aspect in health promotion and illness management. Low health literacy has been linked to inappropriate use of the healthcare system (Berkman et al. 2011). Health literacy is defined as the ability to absorb and critically assess health information, as well as make health-related decisions. Health literacy has an impact on the patient-provider interaction, self-care, and usage of the healthcare system (Paasche-Orlow and Wolf, 2007).

Awareness of antibiotic use among rural people is a critical issue as misuse and overuse of antibiotics can lead to antibiotic resistance, making infections harder to treat. Raising awareness of antibiotic use and resistance among rural people is vital to preserve the effectiveness of antibiotics and protect public health. Efforts to improve education, access to healthcare, and regulation of antibiotic use can help address this important issue.

## V. METHODOLOGY

Study design : Cross sectional study
Sampling technique : Purposive
Study Period : One day (09-09-2023)
Study Area : Raicho, Sadar, Cumilla

**Selection criteria:**
Inclusion criteria: Adult, mentally competent, Able to listen and speak
Exclusion criteria: Those who are unwilling to take part in the study.
Sample Size: 30 respondents.
Data collection tools: Specially designated data collection form.

**Data Analyses:**
After taking consent and matching eligibility criteria, data were collected from patients on variables of interest using the predesigned structured questionnaire by interview. Statistical analyses of the results were be obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-24).

**Ethical Considerations:**
The confidentiality of the respondents and data was strictly maintained.

## VI. RESULTS

This cross-sectional study was conducted in the area of Raicho, Sadar, Cumilla. This study was conducted among previous after fulfilling the exclusion and inclusion criteria by purposive sampling method. A total of 30 apparent patients were included in the study.

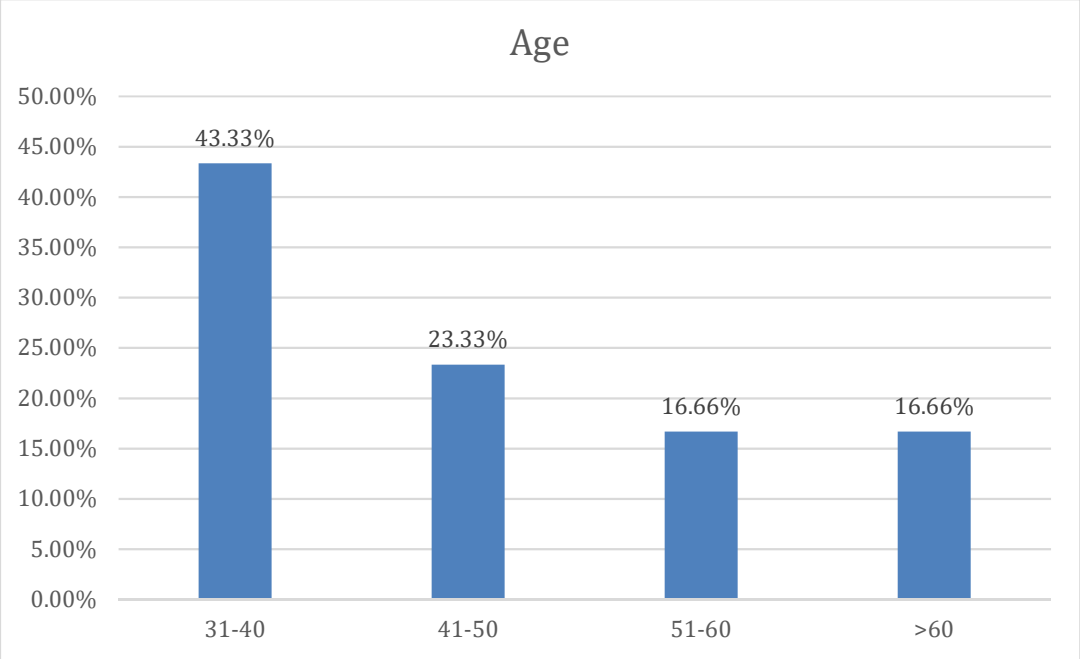


**Fig-I : Distribution of study population by their age group**

Figure I show highest distribution of study population belongs to age group 31-40 with the 43.33% followed by age group 41-50 with 23.33%.

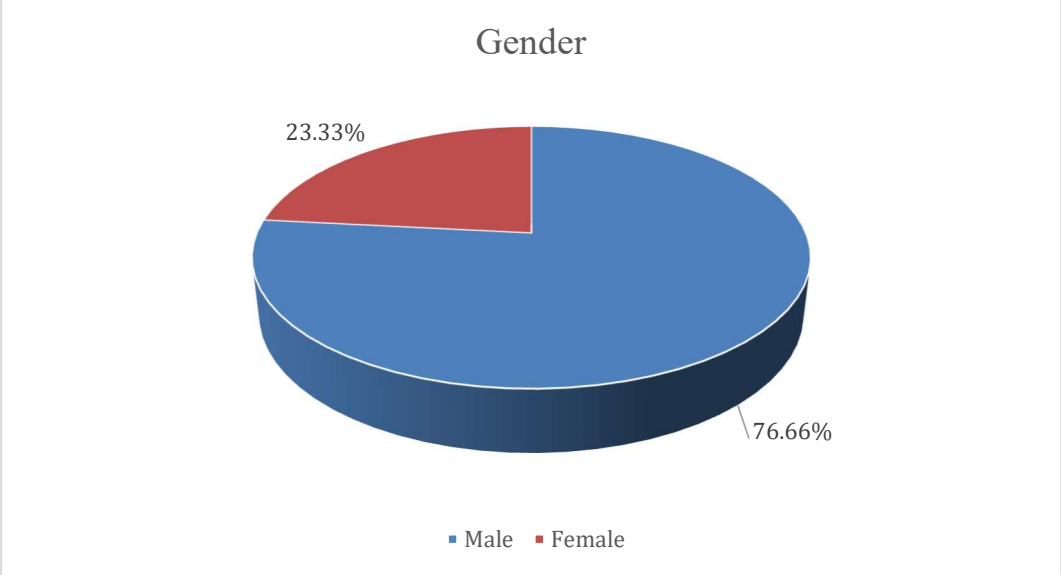


**Fig II: Distribution of study population by their gender**

Figure II shows distribution of study population by the gender with male predominance with 76.66% and rest of 23.33% were female.

**Table I: Distribution of study population by their monthly income**

| Monthly income (Thousand) | N=30 | % |
|---|---|---|
| 10-20 | 14 | 46.66% |
| 21-30 | 9 | 30.00% |
| 31-40 | 5 | 16.66% |
| >40 | 2 | 6.66% |
| Total | 30 | 100% |

Table I shows highest distribution of study belongs to 10-20 thousand monthly income group with 46.66% and lowest distribution of study population belongs to >40 thousands monthly income group with 6.66%.

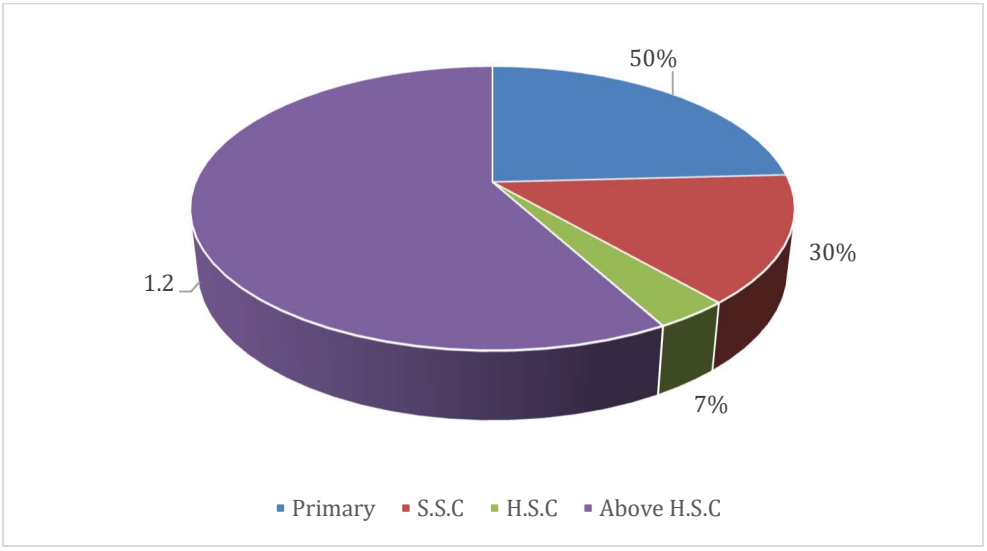


**Fig III: Distribution of study population by their education**

Figure III shows highest distribution of study population by their education belongs to primary group with 50% and lowest distribution of study population belongs to HSC group with 7%.

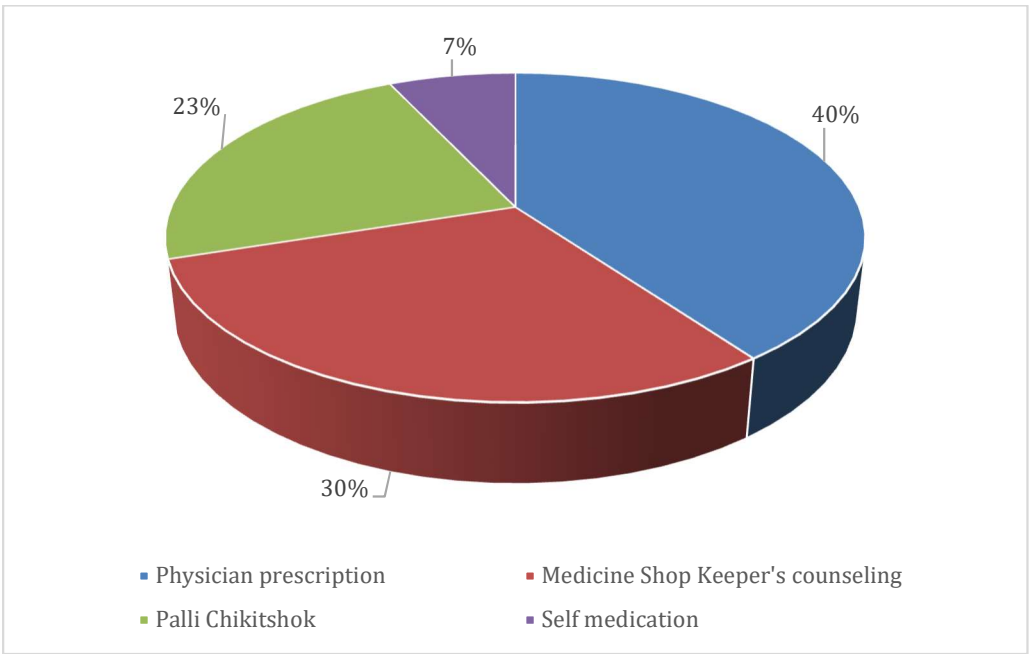


**Fig IV: Distribution of the study according to Antibiotic therapies**

Figure IV shows highest distribution of study population belongs to antibiotic therapy taken based on physician's prescription with 40% followed by on medicine shopkeeper's counseling with 30%.

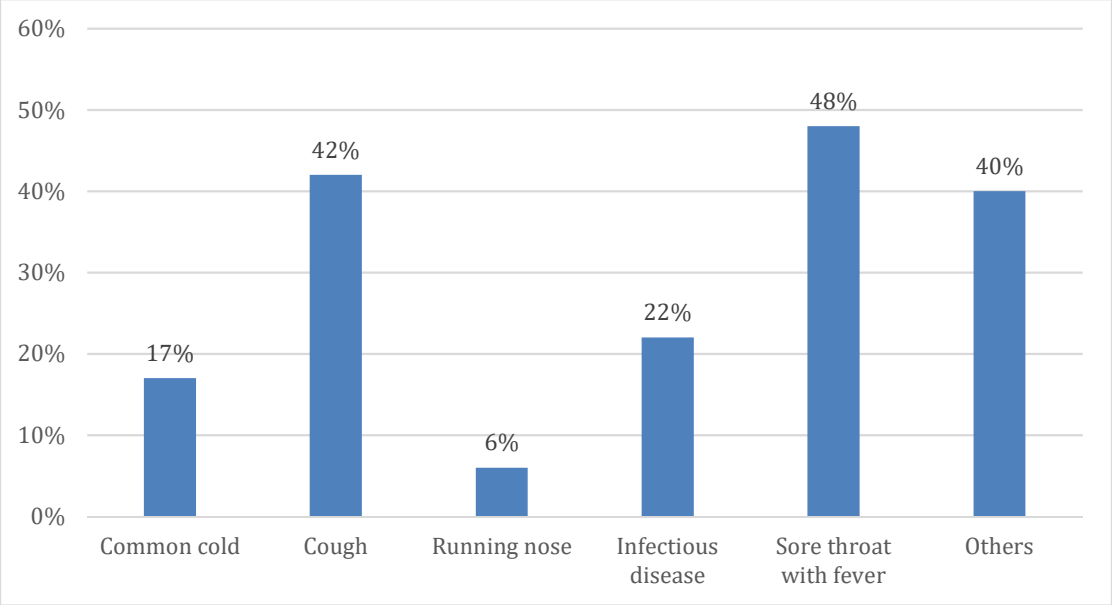


**Fig V: Distribution of the study according to use of Antibiotic**

Figure V shows highest distribution of study population belongs to antibiotic use was due to sore throat with fever with 46.66% followed by common cold with 43.33%.

**Table II: Distribution of the study according to Antibiotic therapy**

| | N=30 | % |
|---|---|---|
| **Until symptoms improved then stopped antibiotic intake** | 13 | 43.33% |
| **With no improvement in the initial couple of days so antibiotic intake stopped** | 08 | 26.66% |
| **Until the course ended and improved** | 08 | 26.66% |
| **Until the course ended but no improvement** | 01 | 3.33% |

Table II shows highest distribution of study population belongs to antibiotic therapy was taken for Until symptoms improved then stopped antibiotic intake with 43.33% and lowest distribution of study population belongs to antibiotic therapy was taken for Until the course ended but no improvement with 3.33%.

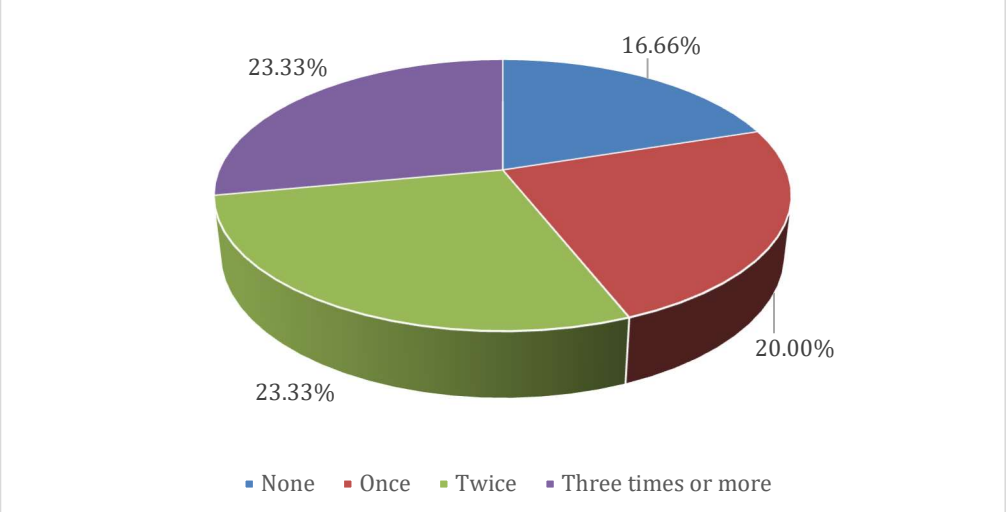


**Fig VI: Distribution of the study according to Frequency of antibiotic used**

Figure VI shows highest frequency of antibiotic used three times or more group with 40% & lowest frequency of antibiotic used none group with 16.66%.

**Table III: Awareness on antibiotic use**

| Q. No | Correct Response | Correct response | % | n(N) |
|---|---|---|---|---|
| **01** | Do you know Antibiotic effective against viral infection | No, it can't | 10 | 3(30) |
| **02** | Do you know Antibiotic effective against bacterial infection | Yes, it can | 43.33 | 13(30) |
| **03** | Do you know Antibiotic will always be effective in the Rx of same infection in future | No, it can't | 16.66 | 5(30) |
| **04** | Do you know Antibiotic works on most cough and cold | No, it can't | 13.33 | 4(30) |
| **05** | Do you know the overuse of Antibiotic is the most important increasing reason for resistance of bacteria against the drug? | Yes, it can | 16.66 | 5(30) |
| **06** | Do you know Discontinuation of Antibiotic therapy is the prime reason for Resistance of bacteria? | Yes, it can | 16.66 | 5(30) |
| **07** | If you get side effect (nausea, diarrhea) in a course of Antibiotic therapy will you stopped taking antibiotic as soon as possible without counseling your doctor. | No, I don't | 23.33 | 7(30) |
| **08** | If you develop allergic reaction Rash, Breathlessness) should you stop taking Antibiotic as soon as possible without counseling your doctor. | No, I don't | 23.33 | 7(30) |
| **09** | Do you know the negative impact of improper use of antibiotics | Yes, I do | 13.33 | 4(30) |
| **10** | You always complete the course of Antibiotic therapy if you feel better. | Agree | 66.66 | 20(30) |
| **11** | It is a good practice to take Antibiotic from relatives, neighbor without counseling a doctor. | Disagree | 50.00 | 15(30) |
| **12** | You prefer to buy Antibiotic from Dispensary without counseling a doctor. | Disagree | 33.33 | 10(30) |
| **13** | You prefer to keep Antibiotic at home thinning you canuse it later if needed | Disagree | 80.00 | (24.30) |
| **14** | When you develop fever, sore throat you prefer taking Antibiotic from day-1 | Disagree | 70.00 | 21(30) |
| **15** | You prefer to get Antibiotic from Friends and Relatives without a prescription. | Disagree | 66.66 | 20(30) |

## VII. DISCUSSION

The purpose of this study was to analyze the antibiotic prescribing trend at rural community like Raicho villagers. Antibiotics are the most widely administered medications in healthcare settings. Their inappropriate usage leads to a variety of effects, including drug interactions, longer hospital stays, higher costs, and bacterial resistance (Ahmed et al. 2016).

The demographic profile of the current study revealed that the major age group was 31-40 years (43.33%), which was pretty comparable to the study conducted in Assam, India 21-40 years (53%). (Bisht et al. 2009) The rationale for this finding could be that younger patients are more concerned about disease. The demographic profile of this study revealed that male (76.66%) patients outnumber female (23.33%). This conclusion might be attributed to the study population of the Gynaecology and Obstetrics department, which

was comparable to the study done in Gujarat, India, where 57% of the patients were male and 52.86% were female (Solanki and Patel, 2019; Al-Mehdar and Al-Akydy, 2017).

The average amount of medications per prescription is a significant consideration in a prescription audit. To reduce the danger of drug interactions, bacterial resistance, and hospital expenditures, the number of drugs per prescription should be kept as low as feasible. The average number of antibiotics per prescription was 1.74, which was consistent with the study in western Nepal (1.7) (Shankar et al. 2003). Solanki and Patel's 2019 study found that the average amount of antibiotics per prescription was 1.09, with 1.61 in northern India (Khan et al. 2013). According to a 2017 study by Al-Mehdar and Al-Akydy, 55.73% of two antibiotics were prescribed, with 39% in Uttarakhand, India (Joshi et al. 2017). Another study by Remesh et al. (2013) found that 46% of antibiotics were used alone, whereas Joshi found that 18% of antibiotics were used monotherapy (Joshi et al. 2017; Remesh et al 2013).

In this study, 40% of antibiotic therapies were prescribed by physicians, 23% were palliative care, and 7% were self-medication. In several studies undertaken in Kerala, India (60%), Eastern India (82.91%), Yemen (99.7%), and Mongolia (81.9%), interactions were prescribed parenterally (Al-Mehdar, and Al-Akydy, 2017; Remesh et al. 2013). The rationale for the larger percentage of parenteral routes could be because the patients were from the patient department, and the majority of them were severely unwell and required emergency procedures.

In this study, antibiotic usage in patients was 17% for common cold, 42% for cough, 6% for running nose, and 22% for infectious sickness. In the current study, the most commonly prescribed antibiotic therapy was Until symptoms improved then stopped antibiotic intake (43.33%), with no improvement in the first few days so antibiotic intake stopped (26.66%), until the course ended and improved (26.66%), and until the course ended but no improvement (3.33%).

A study conducted in Kerala, India found that 96% of patients received therapy for three days or longer (AK et al. 2013). The duration of antibiotic therapy was brief because the majority of the patient turnover was due to term pregnancy in the Gynaecology & Obstetrics Department, where antibiotics were recommended for caesarean section or normal delivery. Inappropriate use and prolonged postoperative doses provide no additional benefit, and may increase the prevalence of resistant bacteria in subsequent nosocomial infections (Dellinger, 2007).

The changing patterns of antibiotic use aided the WHO's worldwide antimicrobial resistance strategy. In the current study, the highest frequency of antibiotic use three times or more was 40%, while the lowest frequency of antibiotic use was 16.66%.

Given the findings of this study, the majority of them did not complete the antibiotic course. They quit when they felt better the majority of the time. Although they had contacted medicine shopkeepers, Palli chikitshok, and self-medication, the majority of them consulted with professionals. Most of the time, more than half believe they are abusing antibiotics. Also, most people assume that antibiotics decrease the duration of an illness and cannot destroy healthy microorganisms, yet they actually weaken the body.

## VIII. CONCLUSION

Antibiotics have saved millions of lives throughout history. However, antimicrobial resistance and drug failure rates are disturbingly high. In nations like ours, where antibiotics can be purchased without a prescription, the emergence and spread of resistance is accelerated. About antimicrobial resistance, just half of respondents believe it is occurring. They determined that antibiotic abuse, failure to utilize the right antibiotic, and failure to complete the course were to blame. Close monitoring and evaluation of rural community clinics by BMDC qualified MBBS physicians, as well as a prescription-based medicine distribution system, will undoubtedly be beneficial.

**Limitations of the study**

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.

## IX. RECOMMENDATION

This study can serve as a pilot to much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

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