

## Original Research Article

# AWARENESS AND PRACTICES RELATED TO ANTIBIOTIC USE AND RESISTANCE AMONG THE GENERAL PUBLIC

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Received : 10/12/2025  
Received in revised form : 02/02/2026  
Accepted : 19/02/2026

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DOI: 10.70034/ijmedph.2026.1.314

Source of Support: Nil,  
Conflict of Interest: None declared

**Int J Med Pub Health**  
2026; 16 (1); 1819-1822

## ABSTRACT

**Background:** Antibiotic resistance (ABR) is a major global health challenge driven largely by inappropriate antibiotic use in both healthcare and community settings. Public awareness and behavior significantly influence antibiotic consumption patterns. **Objective:** To assess awareness, attitudes, and practices related to antibiotic use and resistance among the general public and to identify demographic factors associated with inappropriate use.

**Materials and Methods:** A community-based survey was conducted among 1,200 adults aged  $\geq 18$  years from urban and rural areas. Data were collected using a structured, pre-tested questionnaire assessing knowledge of antibiotics, attitudes toward their use, practices, and understanding of antibiotic resistance. Descriptive statistics, chi-square tests, and logistic regression analyses were performed.

**Results:** While 78% of participants had heard of antibiotics, only 55% correctly identified their appropriate use for bacterial infections. Approximately 65% incorrectly believed antibiotics are effective against viral infections. Self-medication was reported by 41%, and 58% admitted discontinuing antibiotics once symptoms improved. Only 34% had heard of antibiotic resistance, and among them, understanding was limited. Lower education level and rural residence were significantly associated with poor knowledge and inappropriate practices ( $p < 0.05$ ).

**Conclusion:** Significant gaps exist in public knowledge and practices related to antibiotic use. Misconceptions and risky behaviours contribute to antibiotic resistance. Targeted education campaigns and stricter regulatory policies are urgently needed to promote rational antibiotic use.

**Keywords:** Antibiotic resistance, public awareness, self-medication, antibiotic misuse, antimicrobial stewardship.

## INTRODUCTION

Antibiotics are among the most important discoveries in modern medicine and have played a crucial role in reducing morbidity and mortality from infectious diseases.<sup>[1]</sup> Since their introduction in the early twentieth century, antibiotics have enabled the effective treatment of bacterial infections and supported advances in surgery, cancer therapy, organ transplantation, and intensive care medicine.<sup>[2]</sup> However, the growing problem of antibiotic resistance (ABR) now threatens these

achievements.<sup>[3,4]</sup> Antibiotic resistance occurs when bacteria evolve mechanisms that allow them to survive exposure to antibiotics that would normally kill them or inhibit their growth.<sup>[5]</sup> As resistant strains spread within communities and across countries, common infections become harder to treat, leading to prolonged illness, increased healthcare costs, and higher mortality rates.<sup>[6,7]</sup> One of the major drivers of antibiotic resistance is the inappropriate use and overuse of antibiotics, particularly in community settings. Antibiotics are frequently used to treat viral infections such as the common cold, influenza, and

sore throat, despite being ineffective against viruses.<sup>[8]</sup> In addition, many individuals discontinue antibiotic treatment once symptoms improve rather than completing the prescribed course.<sup>[9]</sup> Practices such as self-medication, purchasing antibiotics without a prescription, sharing medicines with family members, and using leftover antibiotics from previous illnesses further contribute to the development of resistance. These behaviours expose bacteria to sub-therapeutic levels of antibiotics, creating favourable conditions for resistant strains to emerge and multiply.<sup>[10,11]</sup> Public awareness and understanding of antibiotics significantly influence usage patterns. Misconceptions regarding the effectiveness of antibiotics, their safety, and the concept of resistance remain widespread in many populations. For example, some individuals believe that antibiotics can cure all types of infections or that stronger antibiotics result in faster recovery.<sup>[12]</sup> Others misunderstand antibiotic resistance as the body becoming resistant to the drug rather than bacteria adapting to survive treatment. Such misconceptions may lead to inappropriate expectations from healthcare providers, including pressure on physicians to prescribe antibiotics unnecessarily.<sup>[13]</sup> Sociodemographic factors such as education level, socioeconomic status, access to healthcare, and urban–rural differences also affect knowledge and practices related to antibiotic use.<sup>[14]</sup> In many regions, especially where regulatory enforcement is weak, antibiotics are easily available over the counter, facilitating self-medication. Cultural beliefs and social norms may further shape health-seeking behaviour and medication practices.<sup>[15]</sup> Given the critical role of the general public in antibiotic consumption, assessing awareness, attitudes, and practices is essential for designing effective interventions. Understanding existing knowledge gaps and behavioural patterns can help inform public health strategies, strengthen antimicrobial stewardship programs, and promote rational antibiotic use.<sup>[16]</sup> Therefore, this study aims to evaluate awareness and practices related to antibiotic use and resistance among the general public, providing evidence to support efforts in combating the growing threat of antibiotic resistance.

## MATERIALS AND METHODS

### Study Design and Setting

A community-based surveillance I study was conducted to assess awareness and practices related to antibiotic use and antibiotic resistance among the general public. The study was carried out between January and August 2025.

### Study Population

The study included adults aged 18 years and above who had been residing in the selected community for at least six months prior to the survey.

### Inclusion Criteria

- Adults aged  $\geq 18$  years

- Permanent residents of the selected area
- Individuals willing to participate

### Exclusion Criteria

- Healthcare professionals (doctors, nurses, pharmacists, and medical students)
- Individuals unable to respond due to severe illness or cognitive impairment
- Individuals who declined consent

### Sample Size and Sampling Technique

A total of 100 participants were included in the study. Participants were selected using simple random sampling to ensure representation across different age groups, genders, educational levels, and residential areas.

### Data Collection Tool

Data were collected using a structured, pre-tested questionnaire consisting of 20 items divided into four sections:

1. Sociodemographic characteristics
2. Knowledge regarding antibiotic use and resistance
3. Attitudes toward antibiotic use
4. Practices related to antibiotic use

### Scoring System

Knowledge responses were scored as follows:  
Correct answer = 1  
Incorrect/Not sure = 0

The total knowledge score ranged from 0 to 5. Participants scoring  $\geq 3$  were categorized as having good knowledge, while those scoring  $< 3$  were classified as having poor knowledge.

### Ethical Considerations

The study was a non-interventional, questionnaire-based survey involving anonymous data collection. No personal identifiers or sensitive information were recorded. Participation was voluntary, and informed consent was obtained from all participants. As the study involved minimal risk and no clinical intervention, it was considered low-risk survey research under institutional norms.

### Statistical Analysis

Data were entered into Microsoft Excel and analysed using statistical software. Descriptive statistics were used to summarize variables. Categorical variables were expressed as frequencies and percentages. Where applicable, inferential statistics were applied, and a p-value  $< 0.05$  was considered statistically significant.

## RESULTS

### Sociodemographic Characteristics

A total of 100 participants were included in the analysis. The majority of participants belonged to the 18–29 years age group, followed by 30–44 years, 45–59 years, and  $\geq 60$  years. Males slightly outnumbered females. Most participants were graduates, and a higher proportion resided in urban areas compared to rural areas. [Figure 1]

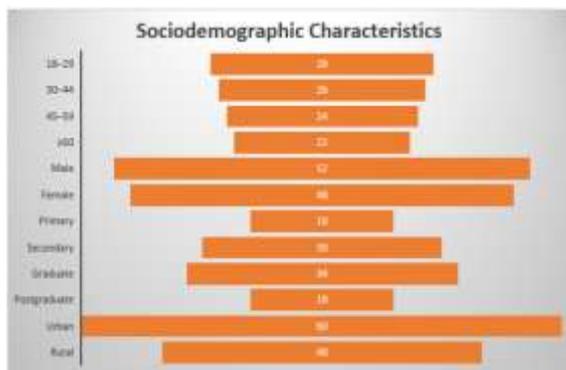


Figure 1 here: Sociodemographic Characteristics of Participants

Knowledge Regarding Antibiotic Use and Resistance  
The majority of participants correctly identified that antibiotics are effective against bacterial infections. However, a considerable proportion incorrectly believed that antibiotics are effective against viral infections. Most respondents were aware that incomplete antibiotic courses contribute to antibiotic resistance and recognized that self-medication can be harmful. Additionally, a majority acknowledged that antibiotic resistance can spread between individuals. Based on the scoring criteria, more than half of the participants demonstrated good knowledge, while the remaining participants were categorized as having poor knowledge. [Table 1]

Table 1: Knowledge and Awareness Regarding Antibiotics

Statement	Correct Response n (%)	Incorrect/Not Sure n (%)
Antibiotics are effective against bacterial infections	76 (76.0)	24 (24.0)
Antibiotics are effective against viral infections	41 (41.0)	59 (59.0)
Incomplete antibiotic course contributes to resistance	68 (68.0)	32 (32.0)
Self-medication with antibiotics is harmful	71 (71.0)	29 (29.0)
Antibiotic resistance can spread between individuals	64 (64.0)	36 (36.0)

### Practices Related to Antibiotic Use

Nearly half of the participants reported using antibiotics without a prescription. A notable proportion admitted discontinuing antibiotics once they felt better. While most participants reported checking the expiry date before use, a considerable

number stored leftover antibiotics for future use. Sharing antibiotics with others was also reported by some respondents. These findings suggest that despite moderate knowledge levels, inappropriate antibiotic practices remain prevalent among the general public. [Table 2]

Table 2: Practices Related to Antibiotic Use

Variable	Yes n (%)	No n (%)
Used antibiotics without prescription	46 (46.0)	54 (54.0)
Stopped antibiotics when feeling better	39 (39.0)	61 (61.0)
Check expiry date before use	72 (72.0)	28 (28.0)
Store leftover antibiotics	44 (44.0)	56 (56.0)
Shared antibiotics with others	28 (28.0)	72 (72.0)

## DISCUSSION

The present study evaluated knowledge, attitudes, and practices (KAP) regarding antibiotic use and antimicrobial resistance (AMR) among 100 participants. Although overall awareness of antibiotics and AMR was moderate, inappropriate practices particularly self-medication, antibiotic use for viral illnesses, and premature discontinuation of therapy were still observed. These findings indicate a persistent gap between awareness and responsible antibiotic behavior. The 2022 Global Antimicrobial Resistance and Use Surveillance System (GLASS) report by the World Health Organization emphasized that resistance levels remain high across multiple priority pathogens and identified inappropriate antibiotic use in community settings as a major driver of AMR progression.<sup>[17]</sup> The report further highlighted the importance of strengthening national surveillance systems and promoting rational antibiotic use. The inappropriate practices identified in our study, particularly non-prescription use, align with these global concerns. Advances in genomic surveillance further demonstrate the accelerating spread of resistance determinants. A 2025 study

published in PLOS Global Public Health described the AMR. Watch platform, which utilizes global genomic datasets to monitor antimicrobial resistance trends in real time.<sup>[18]</sup> The authors emphasized that continuous transmission of resistant strains is closely linked to antibiotic misuse and poor stewardship. The behavioural gaps identified in our participants may contribute to such trends at the community level. Similarly, a 2025 surveillance study in Discover Public Health reported substantial misuse of antibiotics among university students receiving malaria therapy in Nigeria, despite reasonable awareness of AMR.<sup>[19]</sup> This study demonstrated that even educated populations may engage in inappropriate antibiotic consumption, reinforcing the findings of the present study. The persistence of such practices suggests that awareness campaigns alone may be insufficient without targeted behavioural interventions.

Future projections further underscore the urgency of intervention. The Global Research on Antimicrobial Resistance (GRAM) Project, published in The Lancet Infectious Diseases in 2024, forecasted a significant increase in AMR-related mortality by 2050 if current trends continue.<sup>[20]</sup> The authors stressed the need for

strengthened antimicrobial stewardship, improved access to diagnostics, and rational prescribing practices. Our findings support these recommendations, as moderate knowledge levels did not consistently translate into appropriate antibiotic practices. Although awareness of antimicrobial resistance exists among participants, inappropriate antibiotic use remains common. The findings highlight a clear gap between knowledge and actual practices. Addressing this gap requires comprehensive and sustained efforts, including stricter enforcement of regulations on antibiotic sales, implementation of community-based antimicrobial stewardship initiatives, targeted health education programs, and strengthened monitoring systems to promote responsible antibiotic use and reduce the spread of resistance.

**Limitations:** This study's surveillance design limits causal inference, and reliance on self-reported practices may introduce recall or social desirability bias. Nonetheless, the findings align with broader literature and provide valuable insights into behavioural determinants of antibiotic misuse.

## CONCLUSION

This study demonstrates substantial gaps in public awareness and practices regarding antibiotic use and resistance. Misconceptions about the effectiveness of antibiotics for viral infections, high rates of self-medication, and premature discontinuation of treatment highlight behaviors that contribute to antimicrobial resistance. Educational level and place of residence significantly influenced knowledge and practices, indicating the need for targeted community-based interventions. Strengthening public education campaigns, promoting antimicrobial stewardship, and enforcing regulations on antibiotic sales are essential steps to encourage rational antibiotic use and curb the growing threat of antibiotic resistance.

**Funding:** None.

**Authors Contributions:** All the authors have contributed equally.

**Conflict of Interests:** Declared none

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