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Research Article

# Antimicrobial Resistance: A Qualitative Exploration of Perceptions of Medical Professionals

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## A B S T R A C T

*Introduction:* Antimicrobial resistance (AMR) presents a critical global health concern, jeopardising the efficacy of treatments against various microorganisms. Its impact on healthcare and the projected increase in deaths due to antibiotic-resistant infections underscore the urgency for preventive strategies.

*Methods:* A qualitative study conducted in a medical college and hospital involved faculty members and postgraduates in focused group discussions (FGDs). The discussion was conducted under 10 themes, transcribed, and analysed.

*Results:* Ten participants from diverse medical specialities engaged in the FGDs, revealing insights into the causes, effects, and prevention of AMR. Responses emphasised injudicious antibiotic use, lack of proper policies, and the emergence of resistant organisms. Concerns included specific antibiotics losing efficacy and the impact on patient outcomes and healthcare expenses.

*Conclusion:* Tackling AMR demands collective and sustained action involving governments, healthcare professionals, researchers, and public engagement. This study highlights the urgency to deal with antimicrobial resistance comprehensively and collaboratively to safeguard the efficacy of antimicrobial treatments and ensure global well-being.

**Keywords:** Antibiotics, Resistance, Qualitative Study

## Introduction

Antimicrobial resistance (AMR) is a significant global health concern. It is the capacity of a microbe (like bacteria, viruses, and parasites) to stop an antimicrobial (such as antibiotics, antivirals, or antimalarials) from working against it.[1] This leads to infections that are difficult or impossible to treat, posing a serious threat to human health. Globally, nearly 700,000 deaths per year are attributed to antibiotic-resistant infections which is expected to increase by 10 million deaths per year till 2050.[2]

The escalation of AMR poses an urgent and evolving global peril, significantly impacting our capability to provide efficient healthcare while also causing substantial financial strain. The escalating demand for antimicrobial usage on a global scale, coupled with inadequate management practices, leads to substantial misuse of these medications.

Collectively, these issues underscore the necessity for robust strategies that promote the judicious use of antimicrobials.[3]

The World Health Organization (WHO) is leading a worldwide effort to increase awareness on AMR and to promote better practices among the public, policymakers, healthcare workers, and those in agriculture to prevent the continued growth and dissemination of antibiotic resistance.[4] Hence the objective of this study was to understand the perceptions of medical professionals regarding AMR for thoroughly evaluating the consequences of AMR in the community and exploring the strategies for its prevention.

## Material & Methods

### Focus Group Discussions (FGDs)

This qualitative study, which was carried out from March 2023 to April 2023, involved 10 faculty members and postgraduates. The study was conducted in the Department of Community Medicine, Vinayaka Mission's Kirupananda Variyar Medical College & Hospital, Salem. The participants who were willing to give consent and participate were identified and included in the study. The FGDs were conducted in person and recording was done throughout the discussion. The tentative thematic areas of AMR were discussed in the FGDs. Based on the saturation technique, the decision was made to limit the FGDs, to not more than two, since they provided comparable information. Participants' consent was secured during the recording process. The recordings were transcribed into a digital format and managed by the Principal investigator for subsequent analysis.

## Data Management

In this research, we explored the intricate process of capturing the diverse voices and perspectives within FGDs. Specifically, we delved into the meticulous transcription of these discussions and their subsequent entry into Microsoft Excel for comprehensive analysis. The FGDs serve as invaluable sources of qualitative data, offering a rich tapestry of viewpoints, opinions, and insights. By meticulously transcribing these dialogues, we aim to preserve the essence of each participant's contribution, capturing nuances and emotions that might otherwise be lost. The organisation of this data within Excel facilitates systematic categorisation, coding, and thematic analysis, empowering researchers to distil meaningful patterns, themes, and correlations. Through this methodical approach, we seek to unravel the complexities embedded within FGDs, shedding light on diverse perspectives, and fostering a deeper grasp of the studied phenomena.

## Statistical Analysis

The transcribed FGD data were entered into Microsoft Excel, then it was organised, grouped and coded for both thematic and content analysis. Clear suggestions were formulated by calculating the frequency of the responses.

## Ethical Consideration

The authorisation for conducting this study in the hospital was obtained from the Chairman of the Ethics Committee of Vinayaka Mission's Kirupananda Variyar Medical College & Hospital, Salem, India.

## Results

FGDs were done among 10 participants in a Medical College and Hospital of Salem, based on the thematic areas of AMR as shown in Table 1. Different speciality clinicians participated in the FGD with 40% male and 60% female composition. The majority of participants were from the Medicine department followed by Microbiology and Paediatrics. The mean age of the participants was 24 years.

**Table 1.Thematic Areas for the Focus Group Discussion (FGD) on Antimicrobial Resistance (AMR)**

| | |
|---|---|
| **Theme 1: Awareness of AMR**<br>• Knowledge of AMR<br>• Causes of AMR<br>• Hospital policies to combat AMR | **Theme 2: AMR as an emerging threat**<br>• Morbidity and mortality due to AMR<br>• Common organisms with AMR<br>• Use of antibiotics |
| **Theme 3: Drugs that are becoming resistant to organism**<br>• Common and serious drug-resistant strains<br>• Drugs of AMRCulture test for antibiotics use | **Theme 4: Organisms that are becoming resistant to drug**<br>• Hospital set-up and AMR strains<br>• ICU set-up vs OP set-up<br>• Reasons for AMR |
| **Theme 5: Causes of AMR**<br>• The age group that is mostly affected<br>• Dosage and drug selection issue<br>• Over-the-counter antibiotics | **Theme 6: Effect of AMR**<br>• Out-of-pocket expenditure<br>• Longer duration of hospital stays<br>• Unnecessary dispute between the patient and the physicians |

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| | |
|---|---|
| **Theme 7: Prevention of AMR**<br>• Judicious use of antibiotics and automated DST<br>• Prescribing narrow-spectrum antibiotics<br>• Proper hygiene and hand washing<br>• Avoiding multiple prescriptions of drugs<br>• Public awareness on AMR | **Theme 8: One Health Approach and contribution from other sectors in AMR**<br>• Government policies on regulating AMR<br>• Unnecessary use of antibiotics in poultry<br>• Surveillance of antibiotics usage and<br>• pharmaceuticals for avoiding OTC drugs |
| **Theme 9: AMR Control Committee in an institution**<br>• Formation of a separate infection control team<br>• Strict vigilance on the administration of antibiotics<br>• Regular fumigation process in ICU<br>• Monthly/ fortnight review | **Theme 10: Specimen sent for laboratory assessment for AMR**<br>• Availability in the institution<br>• Kirby–Bauer Disk Diffusion Method<br>• Calculation of MIC value<br>• Checking reports and comparing them with the symptoms |

**Table 2.Responses from the Participants on Various Thematic Areas**

| S. No. | Thematic Areas | Number of Responses |
|---|---|---|
| **A** | **Awareness on AMR** | |
| 1 | Injudicious use of antibiotics | 4 |
| 2 | Lack of a proper policy for the usage of over-the-counter drugs | 3 |
| 3 | Need for antibiotic sensitivity testing before prescribing higher antibiotics | 3 |
| **B** | **AMR as an emerging threat** | |
| 1 | Automated system for finding the susceptibility | 3 |
| 2 | Common organisms getting resistant to antibiotics | 3 |
| 3 | Broad-spectrum antibiotic usage has to be reduced | 4 |
| **C** | **Drugs that are becoming resistant to organisms** | |
| 1 | Methicillin/ vancomycin | 3 |
| 2 | Fluoroquinolones | 2 |
| 3 | Colistin/ polymyxin | 2 |
| 4 | Penicillin/ aminoglycosides | 3 |
| **D** | **Organisms becoming resistant to drugs** | |
| 1 | Enterobacteriaceae | 9 |
| 2 | Gram-positive (staph/ clostridium) | 1 |
| **E** | **Causes of AMR** | |
| 1 | Mutant gene | 1 |
| 2 | Injudicious use of antibiotics | 6 |
| 3 | Inappropriate dosage of antibiotics | 3 |
| **F** | **Effects of AMR** | |
| 1 | Longer hospital stays | 5 |
| 2 | Stress and depression | 2 |
| 3 | Out-of-pocket expenditure | 2 |
| 4 | Complication and mortality | 1 |
| **G** | **Prevention of AMR** | |

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| | | |
|---|---|---|
| 1 | Awareness of hand hygiene | 2 |
| 2 | Correct diagnosis and judicious use of antibiotics | 5 |
| 3 | Avoid over-the-counter drugs | 1 |
| 4 | Proper dosage/ appropriate use of antibiotics | 2 |
| **H** | **One Health approach** | |
| 1 | Avoid over-the-counter drugs | 2 |
| 2 | Policy/ surveillance | 5 |
| 3 | Unnecessary use of antibiotics in poultry | 1 |
| 4 | Coordination between sectors | 2 |
| **I** | **AMR control committee** | |
| 1 | Strict vigilance on the administration of antibiotics and reporting | 4 |
| 2 | Monitoring committee needed | 3 |
| 3 | Fumigation | 2 |
| 4 | Communication | 1 |
| **J** | **Specimen sent for laboratory assessment of AMR** | |
| 1 | Availability in the institution | 6 |
| 2 | Check the reports and compare them with the symptoms | 4 |

Table 2 shows responses from the participants on the various thematic areas. Regarding awareness of AMR, a majority (4) of them said that AMR was mainly due to the injudicious use of antibiotics, 3 of them said that AMR was due to the lack of a proper policy for the usage of over-the-counter drugs, and 3 of them mentioned the need for antibiotic sensitivity testing before prescribing higher antibiotics.

Regarding the perception of AMR as an emerging threat, 4 participants responded that broad-spectrum antibiotic usage should be reduced and 3 of them said that the focus should be on automated systems for finding the susceptibility of organisms.

With reference to the drugs that are becoming resistant to organisms, a majority (6) of the respondents answered that methicillin, vancomycin, penicillin and aminoglycosides were becoming commonly resistant to microorganisms.

Regarding the organisms becoming resistant to drugs, most (9) of the respondents opined that even common organisms like E. coli were becoming resistant to antibiotics.

While answering regarding the causes of AMR, a majority (9) of them said that the most common causes of AMR were the injudicious use and inappropriate dosage of antibiotics.

With reference to the effects of AMR, as per most (5) of the respondents, it led to longer hospital stays, while 2 of them said that it resulted in stress and depression and as per 2 of them, it resulted in an increase in out-of-pocket expenditure.

While discussing the prevention of AMR, a majority (5) said that correct diagnosis and judicious use of antibiotics could prevent AMR, and 4 participants said that awareness of hand hygiene and proper dosage/ appropriate use of antibiotics could prevent AMR.

During the discussion on the One Health approach and the contribution of other sectors to AMR, most (5) responses were of the opinion that there should be proper surveillance to check whether the drugs were administered properly and whether the policies were being implemented.

Regarding the AMR control committee, most (7) of them said that strict vigilance was needed on the administration of antibiotics to the patients based on their symptoms, culture reports and laboratory reports for antimicrobial resistance should be filed appropriately, and a monitoring committee was essential.

Regarding the specimens sent for laboratory assessment for AMR, a majority (6) of them were aware that the Kirby–Bauer disk diffusion method and facility for MIC value calculation were available in the institution.

## Discussion

AMR is an emerging threat to the public health worldwide. Apart from the clinical setting, there are places for the emergence of AMR. Furthermore, numerous other factors contributed to the development of antimicrobial-resistant genes.[5] This contributes to untreatable frequent infections, which leads to increased morbidity and mortality. Exploitation and over-the-counter prescription of antibiotics contribute to the emergence of AMR. Over

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the years, higher antibiotics like meropenem have been used casually by people.[6] Antibiotic-resistant germs can spread internationally through travel and trade, which is a public health concern requiring international cooperation.[7]

Suboptimal treatment or treatment failure of these resistant cases leads to elevated clinical and economic costs in the context of AMR.[8] Developing antibiotics by identifying and measuring resistance, in conjunction with practising antimicrobial stewardship, are crucial measures in the fight against the proliferation and emergence of AMR.[9] The holistic approach to health acknowledges the interconnection between human health, animal well-being, and environmental health. Tackling AMR necessitates a comprehensive approach that encompasses healthcare, veterinary medicine, and environmental management.[10] Raising awareness and educating both, individuals within the public sphere and healthcare professionals about AMR, is vital to changing behaviours and reducing its impact. Interventional education effectively enhances awareness, comprehension and perceptions of AMR.[11]

The government as well as international agencies are executing policies and regulations to combat AMR, such as antibiotic stewardship programmes and restrictions on over-the-counter antibiotic sales. AMS stands for Antimicrobial Stewardship, a set of coordinated strategies aimed at improving patient care and outcomes through the optimal use of antibiotics, reducing collateral damage such as antimicrobial resistance, and lowering the overall cost of antibiotic treatment.[3]

## Conclusion

Addressing AMR is a difficult and ongoing challenge, requiring sustained efforts from governments, healthcare providers, researchers, and the public. Failure to tackle AMR effectively poses treatment challenges for common infections, with dire consequences for global health.

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