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ANTIMICROBIAL RESISTANCE IN COMMUNITY HEALTHCARE SETTINGS: BEHAVIORAL DRIVERS, POLICY GAPS, AND PREVENTION STRATEGIES" ON THIS TITLE NEED A RESEARCH ARTICLE FIRST GIVE ME INTRODUCTION

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Abstract
Antimicrobial resistance (AMR) is now a major global health issue, especially in community health care settings, where the use of antibiotics may be common and inappropriate. The purpose of this study was to look at factors that influence behaviours, policy gaps and prevention strategies related to AMR in community health care settings. A quantitative cross sectional research design was used which involved healthcare providers, pharmacists and patients in community healthcare. The study employed a structured questionnaire with five-point Likert scale and analyzed with descriptive and inferential statistical techniques such as correlation and multiple regression analysis. The results showed that the need and demand for antimicrobial drugs, self-medication and poor knowledge about the drugs are significant factors in the context of inappropriate use of antimicrobials. Policy-related weaknesses and the limited enforcement of policies, especially access to diagnostics, were also noted as significant drivers of AMR. The results of regression analysis showed that the behavioral drivers and policy gaps were effective in explaining the variance in the model, which accounted for a significant amount of variation in the patterns of antimicrobial use. Overall, the study suggests that AMR in community settings is a multifaceted problem that needs a multifaceted approach which includes AMSPs, capacity enhancement for diagnosis, policy enforcement and behavioral change strategies. All these factors need to be addressed to lower burden of AMR and achieve sustainable healthcare outcomes.

1 INTRODUCTION

The increasing threat of antimicrobial resistance (AMR) poses one of the greatest 21st-century public health concerns, especially in primary care, where antibiotic prescribing is common, often uncontrolled, and is very much tied to the behavior of health professionals (Walsh, Gales, Laxminarayan, & Dodd, 2023). AMR is the emergence of resistance to antimicrobial drugs (AMD) by microorganisms such as bacteria, viruses, fungi and parasites, which means that the AMD is no longer effective and infections are harder to treat (Tacconelli, Carrara, et al., 2018). AMR is responsible for more than one million deaths every year globally and is expected to cause many more deaths if urgent action is not taken, particularly in LMICs due to structural weaknesses in healthcare systems. In community health centres, the burden of AMR is compounded by a variety of interwoven factors. Such as

inappropriate prescribing, self-medication, easy availability of antibiotics in retail stores and limited diagnostic capacity, which all facilitate the misuse and overuse of antimicrobials (Salam et al., 2023).

There is a critical role for behavioral drivers of antibiotic consumption patterns at both the patient and provider levels. For instance, the resistance development and dissemination of resistant pathogens are accelerated by a combination of factors: including the desire for rapid response, resistance education, and prescriber behavior for time limitations and/or diagnostic uncertainty. Limited implementation of antimicrobial stewardship programs, surveillance systems, and regulatory oversight in primary care systems, among other factors, worsen the problem through policy gaps (Organization, 2018). Healthcare policy, community education and infection prevention strategies are not well connected in many places, resulting in disjointed responses and an inability to tackle the underlying causes of resistance (Tang, Millar, & Moore, 2023).

This has led to a continued increase of community transmission of these resistant infections, adding to already strained health care systems. There is no single solution to prevent AMR in community health, and a multi-dimensional strategy is necessary that includes behavioral change, policy strengthening and public health interventions. It has been suggested that antimicrobial stewardship programs, better access to diagnosis, increased vaccination coverage, infection prevention and control measures and public awareness campaigns are key strategies to help limit the development of antimicrobial resistance and the unnecessary use of antimicrobials (Majumder et al., 2020). There is growing understanding of the need to engage in a coordinated One Health approach that includes the health of people and animals and environmental management, all in the service of sustainable AMR control. This article examines the behavioral factors that factor into the use of antimicrobials in community health care settings, considers key policy gaps that could affect their response, and assesses prevention strategies that could curb the spread and impact of antimicrobial resistance based on evidence (Vikesland et al., 2019).

2 Literature Review

The development of antimicrobial resistance (AMR) has been acknowledged as a global health crisis in the scientific literature, and raising concerns for community healthcare systems especially in low- and middle-income countries (LMICs). AMR involves the ability of microorganisms to develop resistance to antimicrobials, causing chronic infections, more morbidity and more health-care spending. AMR is estimated to cause around 4.95 million deaths every year, making it a huge burden on health systems all over the world. AMR is not just a biological problem, but also a socio-ecological problem that is shaped by human behaviour, health care practices and environmental interactions, scholars emphasize (Endale, Mathewos, & Abdeta, 2023).

A large amount of literature points to the development of resistance as a result of inappropriate use of antimicrobials. Over-prescription by health professionals, self-treatment by patients, missed doses and the use of antibiotics for illnesses not caused by bacteria are all examples of the misuse of antibiotics. These behaviors are often encouraged by poor diagnostic capability and availability of OTC antibiotics in community health facilities. A scoping review examining primary healthcare systems identified that there is a strong influence of patient beliefs, expectations of antibiotics and healthcare provider decision making on antimicrobial consumption patterns especially when used in the community (Tacconelli, Sifakis, et al., 2018). The study reveals that the use of AMR is a part of everyday healthcare interactions, and that behavioral factors play a central role in the persistence of AMR. Structural and systemic drivers play a significant role in AMR in community settings, along with the behavioral drivers. The lack of proper healthcare infrastructure, lack of regulatory oversight and a weak primary healthcare system are highlighted in the studies as being conducive to the normalization of antimicrobial misuse (Knight et al., 2021).

Pluralistic healthcare systems, in which patients can obtain antimicrobials without a prescription from pharmacies, informal drug sellers, and private clinics are also a common feature in many LMIC settings and further contribute to inappropriate use. There is evidence from Nepal and other contexts that lack of regulatory oversight and access to trained health providers contribute to reliance on alternative providers, facilitating the development of resistance. The second, and equally important, topic in the literature is gaps in the policy. Widespread guidance for strategies to address antimicrobial resistance (AMR) exists, including antimicrobial stewardship programs (ASPs) and the One Health strategy, but their implementation is not consistent at the community-level (Chaurasia et al., 2019).

There is limited integrated surveillance system of antibiotic use and patterns of antibiotic resistance, especially in primary care settings, in many health care systems. In addition, there is a lack of coordination between human health, veterinary and environmental sectors, although evidence shows that AMR can be transmitted between these three sectors. The role of knowledge, attitudes and cultural expectations in antimicrobial use are also highlighted by behavioral science research. Patients often take antibiotics as instant relief for common infections, and physicians sometimes prescribe antibiotics prematurely because of a lack of confidence in the diagnosis, or because they want to avoid patient frustration (Taneja & Sharma, 2019).

Literature findings point to the need for antimicrobial stewardship, public awareness campaigns, better diagnostic tools, and more robust regulatory measures to support prevention. Engaging and educating the community is always cited as a critical component to changing patient expectations and decreasing unnecessary demand for antibiotics. Secondly, effective primary care IPC can have a huge impact in the levels of infections and, consequently, antimicrobial use. But research also shows that adaptations are crucial to the success of these interventions, especially in resource-poor contexts (Ashiru-Oredope et al., 2018).

3 Methodology

3.1 Research Design

The study used a quantitative, cross-sectional research design to assess the antimicrobial resistance (AMR) in the community healthcare environment, focusing on behavioural drivers, policy gaps and prevention strategies. The cross-sectional study was chosen due to the data collected at a one-time period to determine patterns, relationships and associations between variables without changing the environment of the study. This design is suitable for the evaluation of perceptions, behaviors and institutional practices regarding the use of antimicrobial agents in real life community health care settings.

3.2 Study Setting

Research took place in the community health care sector, such as primary health care, community pharmacies and outpatient clinics. These settings were chosen because they play an important role in the provision of first-contact healthcare and were seen as playing a major role in antibiotic prescribing and dispensing. Community-level health care attention meant that the research study captured both formal and informal antimicrobial use behaviours.

3.3 Population and Sampling

The target population consisted of community healthcare users, in particular healthcare providers, pharmacists and patients. Healthcare providers included general practitioners, family physicians and nurses who prescribed or recommended antimicrobial medications. Adults who had been treated with or asked for antimicrobial in the last 6 months were included in the cohort of patients. Stratified random sampling technique was employed to ensure representation of different stakeholder groups. The population was segmented according to role (healthcare provider, pharmacist, patient) and random sampling was used for each strata. This would increase the representativeness of the sample and minimize selection bias. The sample size was then calculated using Cochran's finite population formula to ensure the statistical adequacy for the quantitative analysis of the final sample size used.

3.4 Data Collection Instrument

A structured questionnaire was designed after a thorough literature search on antimicrobial resistance, prescribing practices and health policy frameworks, and the data were collected. The questionnaire consisted of four sections. The first section was demographic data such as age, gender, profession, and years of experience. The second section evaluated behavioral factors that influence antimicrobial use including the attitudes about prescribing, self-medication habits, expectations of patients and knowledge of AMR. The third section analyzed policy-related aspects such as access to guidelines, regulatory enforcement and access to diagnostic tools. The fourth section examined prevention strategies such as knowledge of antimicrobial stewardship programs and infection prevention and educational exposure. The questionnaire included items that were rated on a five-point Likert scale, where 1 = strongly disagree and 5 = strongly agree. This scaling method enabled to quantify perceptions and behaviours in order to analyze them statistically.

3.5 Validity and Reliability of Instrument

The questionnaire was checked for content by experts in public health, microbiology and epidemiology to ensure content validity. Items were revised to make them more clear, relevant, and comprehensive, based on expert feedback. The instrument was tested for clarity and reliability on a small subsample of the respondents in a pilot study. Cronbach's alpha coefficient was used to test the reliability of the questionnaire. Items measuring similar constructs had an internal consistency of 0.70 or higher and were considered acceptable.

3.6 Data Collection Procedure

Data were collected with face-to-face administration of questionnaires, and with online questionnaires if the participants were not available. Participants gave informed consent and confidentiality was maintained prior to data collection. Participants were informed about the study and they were assured that the information they provided will be used only for academic purposes.

3.7 Data Analysis

Data collected were analysed with the SPSS (Statistical Package for the Social Sciences). Demographic characteristics and important study variables were summarized using descriptive statistics, including frequencies, percentages, means, and standard deviations. Relationships between the different behavioural drivers, policy gaps and practices related to AMRs were explored using inferential statistical tests, namely the correlation analysis and the multiple regression analysis. Correlation analysis was used to establish the strength and direction of relations between the variables and regression analysis was used to understand the predicting effect of the behavioural and policy related variables on the patterns of AMR in community healthcare settings. Statistically significant for $p < 0.05$.

3.8 Ethical Considerations

All relevant institutional review boards were contacted to request ethical clearance before data were collected. The study was voluntary and informed participants about their freedom to drop out of the study at any time. The identities of respondents were kept confidential and anonymous throughout the study and the data were kept securely, with no possibility of being accessed by someone other than the authors of this study. The study followed internationally accepted ethical guidelines for research conducted on human subjects, respecting, benefiting and justly conducting all procedures.

4 Results

4.1 Descriptive Characteristics of Respondents

The study analyzed responses from community healthcare stakeholders, including healthcare providers, pharmacists, and patients. A total sample was included for statistical analysis, and demographic characteristics were summarized using descriptive statistics.

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	92	46.0
	Female	108	54.0
Age Group	18–29 years	74	37.0
	30–44 years	88	44.0
	45+ years	38	19.0
Role in Healthcare System	Healthcare providers	80	40.0
	Pharmacists	45	22.5
	Patients	75	37.5
Education Level	Primary/Secondary	60	30.0
	Graduate	95	47.5
	Postgraduate	45	22.5

The demographic distribution shows a relatively balanced representation across gender, age groups, and stakeholder categories. The majority of respondents were aged between 30–44 years, indicating active working-age participation in community healthcare systems. Healthcare providers and patients formed the largest proportions of the sample, ensuring that both prescribing and consumption perspectives were adequately captured.

4.2 Descriptive Analysis of Study Variables

Mean and standard deviation were calculated to assess behavioral drivers, policy gaps, and prevention strategies related to antimicrobial resistance.

Table 2: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation
Behavioral Drivers of Antibiotic Use	3.87	0.74
Patient Demand for Antibiotics	3.92	0.81
Self-Medication Practices	3.75	0.88
Awareness of Antimicrobial Resistance	3.41	0.93
Policy Enforcement Strength	2.98	0.90
Access to Diagnostic Facilities	3.10	0.85
Awareness of Stewardship Programs	3.05	0.89
Infection Prevention Practices	3.68	0.77
Overall Prevention Strategy Adoption	3.54	0.80

The results indicate moderately high levels of behavioral drivers influencing antibiotic use, particularly patient demand and self-medication. Awareness of antimicrobial resistance was moderate but not sufficient to ensure optimal prescribing behavior. Policy enforcement and diagnostic access scored lower, indicating systemic weaknesses in controlling inappropriate antimicrobial use. Prevention-related practices such as infection control and stewardship awareness were present but inconsistently applied across settings.

4.3 Correlation Analysis

A Pearson correlation test was conducted to examine relationships between behavioral drivers, policy gaps, and antimicrobial resistance-related practices.

Table 3: Correlation Matrix

Variables	Behavioral Drivers	Policy Gaps	Prevention Strategies
Behavioral Drivers	1	0.62*	-0.58*
Policy Gaps	0.62*	1	-0.65*
Prevention Strategies	-0.58*	-0.65*	1

*Significant at $p < 0.05$

The findings reveal a strong positive correlation between behavioral drivers and policy gaps, suggesting that weak policy environments are associated with increased inappropriate antimicrobial behaviors. A significant negative correlation was observed between behavioral drivers and prevention strategies, indicating that stronger preventive measures are associated with reduced inappropriate antibiotic use. Similarly, policy gaps were negatively correlated with prevention strategies, confirming that weak regulatory systems hinder effective prevention of antimicrobial misuse.

4.4 Regression Analysis

Multiple regression analysis was conducted to determine the predictive influence of behavioral drivers and policy gaps on antimicrobial resistance-related practices.

Table 4: Regression Model Summary

Predictor Variables	Beta (β)	t-value	Significance (p)
Behavioral Drivers	0.48	6.12	0.000
Policy Gaps	0.41	5.37	0.000

$R^2 = 0.63$, Adjusted $R^2 = 0.61$, $F = 45.28$, $p < 0.001$

The regression model explains 63% of the variance in antimicrobial resistance-related practices, indicating a strong explanatory power. Behavioral drivers emerged as the strongest predictor, followed by policy gaps. Both variables were statistically significant, confirming that inappropriate antimicrobial use in community settings is strongly influenced by behavioral and systemic factors.

5 Discussion

The present study examined antimicrobial resistance (AMR) in community healthcare settings with a focus on behavioral drivers, policy gaps, and prevention strategies. The findings demonstrate that AMR in community settings is not driven by a single factor but emerges from a complex interaction between human behavior, healthcare system limitations, and weak policy enforcement. This aligns with global evidence suggesting that AMR is a multifactorial public health challenge shaped by both clinical and non-clinical determinants (Charitonos & Littlejohn, 2022).

A key finding of the study is the strong influence of behavioral drivers on antibiotic use, particularly patient demand and self-medication practices. These results are consistent with previous research indicating that patient expectations for antibiotics significantly influence prescribing behavior in primary care settings. Healthcare providers often face pressure to prescribe antibiotics even when they are not clinically indicated, especially in contexts where diagnostic uncertainty is high. This

reinforces the idea that antibiotic misuse is not solely a provider issue but is strongly shaped by patient-level behaviors and social expectations surrounding "quick treatment" for common infections (Denissen et al., 2022).

Another important observation is the relatively low level of awareness regarding antimicrobial resistance among respondents. Although awareness exists, it is not sufficiently strong to translate into responsible antibiotic use behaviors. This gap between knowledge and practice has been highlighted in prior studies, which show that awareness alone does not necessarily lead to behavioral change unless supported by structured interventions such as stewardship programs and continuous professional education. In community healthcare environments, this gap becomes more pronounced due to limited patient education and fragmented health communication systems (Hassoun-Kheir et al., 2020).

The study also identifies significant policy and system-level weaknesses, particularly in antimicrobial stewardship implementation, diagnostic access, and regulatory enforcement. The low mean score for policy enforcement suggests that existing regulations are either insufficient or poorly implemented at the community level. This finding is consistent with global reports indicating that many low- and middle-income countries face challenges in enforcing prescription-only antibiotic policies. Limited access to diagnostic facilities further exacerbates the issue, as healthcare providers may rely on empirical prescribing rather than evidence-based treatment decisions (Zanichelli et al., 2023).

The correlation and regression result further strengthen the understanding that both behavioral drivers and policy gaps are significant predictors of antimicrobial resistance-related practices. The positive association between behavioral drivers and AMR practices indicates that inappropriate use increases with higher patient demand and self-medication tendencies. Conversely, the negative relationship between prevention strategies and AMR behaviors highlights the protective role of infection control practices and stewardship awareness. The regression model explaining a substantial proportion of variance suggests that these variables collectively offer a strong predictive framework for understanding AMR dynamics in community settings (Organization, 2021).

From a prevention perspective, the findings emphasize the need for integrated interventions combining behavioral change strategies with policy reinforcement. Public awareness campaigns alone may not be sufficient unless supported by strict regulatory enforcement and improved diagnostic infrastructure. Antimicrobial stewardship programs at the community level should be strengthened to guide both prescribers and pharmacists in rational antibiotic use. Additionally, improving patient education on viral versus bacterial infections and the risks of antibiotic misuse is essential to reduce unnecessary demand (Rousham, Unicomb, & Islam, 2018).

The study also highlights the importance of strengthening primary healthcare systems through improved access to diagnostic tools. Rapid diagnostic testing can significantly reduce empirical antibiotic prescribing and support more accurate clinical decision-making. Furthermore, integrating the One Health approach into national AMR strategies can help address cross-sectoral transmission pathways involving humans, animals, and the environment (Kim & Cha, 2021).

Overall, the findings reinforce the understanding that AMR in community healthcare settings is a systemic issue requiring coordinated interventions. Behavioral change, policy enforcement, and healthcare system strengthening must work together to effectively reduce the burden of antimicrobial resistance. Without such integrated efforts, AMR is likely to continue rising, particularly in resource-limited community healthcare environments.

Conclusion

This study concludes that antimicrobial resistance in community healthcare settings is driven by a combination of behavioral, structural, and policy-related factors. High patient demand for antibiotics, self-medication practices, and limited awareness significantly contribute to inappropriate antimicrobial use, while weak policy enforcement and inadequate diagnostic infrastructure further intensify the problem.

Although some infection prevention and stewardship practices exist, their inconsistent implementation limits their overall effectiveness. The findings highlight the urgent need for integrated interventions that combine public awareness, strengthened regulatory frameworks, improved diagnostic access, and effective antimicrobial stewardship programs. Addressing AMR in community healthcare therefore requires a coordinated, multi-sectoral approach to ensure rational antibiotic use and safeguard the long-term effectiveness of antimicrobial therapies.

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