

KNOWLEDGE, ATTITUDE AND PRACTICES ABOUT ANTIBIOTICS USE AMONG THE PATIENTS VISITING COMMUNITY PHARMACIES

Original Article

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ABSTRACT

Background: Antibiotic resistance is an escalating global public health threat, driven largely by inappropriate antibiotic use, especially in low- and middle-income countries. In Pakistan, the availability of antibiotics without prescription and limited health literacy contribute to unsafe practices and poor understanding of antimicrobial resistance. Community pharmacies often serve as primary health access points, particularly in rural settings, making them critical locations for assessing patient behavior and promoting rational drug use.

Objective: To assess the knowledge, attitudes, and practices (KAP) related to antibiotic use among patients visiting community pharmacies in District Tharparkar, Pakistan, and to examine associations with sociodemographic characteristics.

Methods: A cross-sectional survey was conducted from September to November 2024 across selected urban and semi-urban community pharmacies in District Tharparkar. A total of 400 patients aged 18 years and above were recruited through convenience sampling. A structured and pre-tested questionnaire, translated into Urdu, was used to collect data on demographic details and KAP regarding antibiotic use. Data collectors conducted interviews when necessary to assist low-literacy respondents. Descriptive statistics were used to summarize variables, and chi-square tests were applied to assess associations, using SPSS version 29 with a significance threshold set at $p < 0.05$.

Results: Out of 400 participants, 58.5% were male and 60% resided in rural areas. Only 53.0% correctly identified antibiotics as effective against bacterial infections, while 29.0% wrongly believed they work on viral infections. About 48.0% stopped taking antibiotics once symptoms improved, and 58.0% had purchased antibiotics without a prescription. Higher education was significantly associated with better knowledge, attitudes, and practices ($p < 0.001$).

Conclusion: The findings revealed widespread knowledge gaps, inappropriate attitudes, and unsafe antibiotic practices among community pharmacy visitors. These results stress the need for targeted public health education and policy enforcement to curb irrational antibiotic use and address antimicrobial resistance.

Keywords: Antibiotic resistance, Antibiotic use, Community pharmacies, Health knowledge, Pakistan, Patient education, Public health.

INTRODUCTION

The discovery of antibiotics revolutionized modern medicine, significantly reducing morbidity and mortality associated with bacterial infections (1). However, this progress has been increasingly undermined by the global emergence of antibiotic resistance, now recognized as a critical threat to public health (2). The World Health Organization warns that rising resistance compromises the successful treatment of common infections, leading to prolonged illnesses, elevated healthcare costs, and increased risk of mortality (3). Misuse of antibiotics—characterized by unnecessary prescriptions, incomplete treatment regimens, and unsupervised self-medication—remains widespread, particularly in low- and middle-income countries where access to over-the-counter antibiotics is largely unregulated (4). Numerous international studies have highlighted alarming deficiencies in public knowledge, with common misconceptions such as the belief that antibiotics are effective against viral illnesses like the common cold (4). In South Asia, the crisis is compounded by densely populated regions, overburdened healthcare systems, and easy availability of antibiotics without prescriptions (5). Investigations in India, Bangladesh, Nepal, and Sri Lanka consistently demonstrate high rates of self-medication, with community pharmacists often dispensing antibiotics without adequate patient education or medical consultation (6,7). For instance, research in India shows that nearly three-quarters of antibiotics are procured directly from pharmacies without any physician involvement, and public understanding of resistance remains poor (6).

Pakistan reflects a similarly concerning landscape, with both urban and rural populations demonstrating inadequate awareness and dangerous antibiotic practices (8,9). Research conducted in major cities such as Karachi, Lahore, and Islamabad reveal that over half of antibiotics are purchased without a prescription, often based on past experiences or informal advice from pharmacy staff (10). A study in Islamabad reported that a substantial proportion of pharmacy visitors held incorrect beliefs about when antibiotics are needed and considered it acceptable to discontinue treatment early once symptoms subside (11). The lack of trained personnel in many community pharmacies and weak regulatory oversight further exacerbates the issue, contributing to widespread irrational antibiotic use (12). Community pharmacies are a critical access point for antibiotics in Pakistan, positioning them at the forefront of both the problem and the solution. Despite their pivotal role, little is known about the knowledge, attitudes, and practices (KAP) of patients who obtain antibiotics from these settings (13). Antibiotic misuse at the community level not only threatens individual treatment outcomes but also contributes to the propagation of resistant pathogens, amplifying the public health burden (14). Addressing this challenge requires a nuanced understanding of patient behavior and the underlying drivers of misuse to develop context-specific, actionable interventions. This study aims to fill a significant knowledge gap by assessing the knowledge, attitudes, and practices regarding antibiotic use among patients visiting community pharmacies in Pakistan. Furthermore, it seeks to identify the sociodemographic and behavioral factors associated with inappropriate antibiotic use, ultimately offering informed recommendations to foster rational antibiotic practices at the community level.

METHODS

This cross-sectional study was carried out among patients visiting community pharmacies in District Tharparkar, Sindh, Pakistan, from September to November 2024. The study aimed to assess knowledge, attitudes, and practices (KAP) related to antibiotic use at the community level. A convenience sampling technique was employed to select a range of community pharmacies across both urban and semi-urban areas to capture demographic and behavioral diversity among participants. The inclusion criteria comprised patients aged 18 years and above who visited these pharmacies and voluntarily consented to participate. Individuals working in healthcare, including pharmacists and pharmacy staff, were excluded to avoid bias associated with professional knowledge. The minimum required sample size was calculated as 384 using the standard formula for cross-sectional studies, assuming a 95% confidence level, 5% margin of error, and an expected 50% prevalence of adequate knowledge. To compensate for potential non-response or incomplete data, the final target sample was rounded up to 400 participants. Data collection was conducted using a structured and pre-tested questionnaire adapted from previously validated KAP studies related to antibiotic use. The tool was translated into the Sindhi language to ensure linguistic accessibility and cultural relevance. The questionnaire comprised four main sections: sociodemographic characteristics, knowledge regarding antibiotics and resistance, attitudes toward antibiotic usage, and self-reported practices.

Trained data collectors were deployed to the selected pharmacies, where they approached eligible participants, explained the purpose of the study, obtained written informed consent, and conducted interviews for participants with low literacy levels. This ensured inclusivity and reduced the likelihood of response bias due to misunderstanding of questions. Ethical approval for the study was obtained from the Institutional Review Board (IRB). Confidentiality and anonymity of participant data were strictly maintained throughout the research

process, and participants were informed of their right to withdraw at any point without consequences. Collected data were entered, coded, and analyzed using IBM SPSS Statistics version 29. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize participants' demographic and KAP characteristics. Chi-square tests were applied to examine associations between sociodemographic variables and KAP outcomes. A p-value of less than 0.05 was considered statistically significant for inferential analyses.

RESULTS

A total of 400 participants completed the survey, yielding a response rate of 100%. Among these, 58.5% were male and 41.5% female. The most represented age group was 18–30 years (42.0%), followed by 31–45 years (30.0%), 46–60 years (18.0%), and those over 60 years (10.0%). Approximately 35.0% of the respondents had no formal education, while 29.0% had secondary education, 21.0% held a university degree, and 15.0% had completed only primary education. A majority of participants (60.0%) resided in rural areas, reflecting the demographic distribution of District Tharparkar. Regarding knowledge about antibiotics, 53.0% of participants correctly identified their use for treating bacterial infections. However, 29.0% incorrectly believed that antibiotics are effective against viral illnesses. Only 37.0% were aware that incomplete antibiotic courses contribute to resistance, while 41.0% understood that not all infections require antibiotic treatment. Furthermore, 35.0% recognized the reduced effectiveness associated with antibiotic overuse, highlighting notable deficiencies in public knowledge. Participant attitudes also reflected widespread misconceptions. Nearly half (48.0%) agreed that antibiotics could be stopped once symptoms improved, and 44.0% considered it acceptable to buy antibiotics without consulting a doctor. Additionally, 52.0% supported keeping leftover antibiotics for future use, while only 38.0% acknowledged the community health risks posed by antibiotic misuse.

Antibiotic-related practices reported by respondents were similarly concerning. A total of 58.0% admitted purchasing antibiotics without a prescription in the past year, and 46.0% reported discontinuing antibiotic use once they felt better. Half of the respondents (50.0%) had shared antibiotics with others without medical advice, while only 32.0% consistently completed the prescribed antibiotic course, indicating poor adherence to treatment guidelines. Further statistical analysis revealed significant associations between educational attainment and knowledge scores ($p < 0.001$), with higher education linked to greater awareness about antibiotics and resistance. Attitudes toward rational antibiotic use were significantly more favorable among urban residents compared to rural ones ($p = 0.02$). Practices such as completing antibiotic courses and avoiding non-prescribed use were also significantly better among those with secondary or higher education ($p < 0.001$). Stratified analysis of antibiotic-related behaviors revealed notable demographic differences in the prevalence of inappropriate practices. Among gender groups, 60% of males and 55% of females reported purchasing antibiotics without a prescription. Similarly, 47% of males and 44% of females discontinued antibiotics upon symptom relief. The practice of sharing antibiotics was reported by 52% of males and 47% of females, while only 30% of males and 35% of females consistently completed their prescribed antibiotic course.

In terms of age, the highest frequency of purchasing antibiotics without prescriptions was observed in the 18–30 age group (65%), followed by those aged 31–45 (60%), with progressively lower rates in older groups. Discontinuation of antibiotics when feeling better was most common among participants aged 18–30 (50%) and least common among those over 60 (35%). Sharing antibiotics followed a similar trend, being highest in the youngest age group (55%) and lowest in those aged over 60 (35%). Completion of the full antibiotic course was highest among participants aged over 60 (38%) and lowest among those aged 18–30 (28%). Regarding place of residence, 63% of rural residents reported purchasing antibiotics without prescriptions compared to 48% of urban residents. Discontinuation of antibiotics upon symptom improvement and sharing antibiotics were also more common among rural participants (50% and 53%, respectively) compared to their urban counterparts (40% and 45%). Conversely, urban residents demonstrated better adherence to completing full antibiotic courses (38%) compared to rural participants (28%). These findings underscore the influence of demographic factors such as age, gender, and residence on antibiotic misuse patterns and highlight the need for tailored public health interventions.

Table 1: Demographic Characteristics of Participants (N=400)

Variable	Frequency (N)	Percentage (%)
Gender		
Male	234	58.5%
Female	166	41.5%

Variable	Frequency (N)	Percentage (%)
Age Group (years)		
18–30	168	42.0%
31–45	120	30.0%
46–60	72	18.0%
>60	40	10.0%
Education Level		
No formal education	140	35.0%
Primary education	60	15.0%
Secondary education	116	29.0%
University degree	84	21.0%
Residence		
Urban	160	40.0%
Rural	240	60.0%

Table 2: Knowledge About Antibiotic Use Among Participants (N=400)

Knowledge Item	Frequency(N)	Percentage (%)
Antibiotics are used to treat bacterial infections	212	53.0%
Antibiotics are effective against viral infections	116	29.0%
Incomplete antibiotic courses cause resistance	148	37.0%
Not all infections require antibiotic treatment	164	41.0%
Overuse of antibiotics leads to reduced effectiveness	140	35.0%

Table 3: Attitudes Towards Antibiotic Use Among Participants (N=400)

Attitude Statement	Frequency (N)	Percentage (%)
It is acceptable to stop antibiotics once symptoms improve	192	48.0%
Buying antibiotics without consulting a doctor is fine	176	44.0%
Saving leftover antibiotics for future use is good	208	52.0%
Misuse of antibiotics harms community health	152	38.0%

Table 4: Practices Regarding Antibiotic Use Among Participants (N=400)

Practice Item	Frequency (N)	Percentage (%)
Purchased antibiotics without a prescription in past year	232	58.0%
Discontinued antibiotics once feeling better	184	46.0%
Shared antibiotics with family/friends	200	50.0%
Completed full course of prescribed antibiotics	128	32.0%

Table 5: Stratified Antibiotic Behavior by Demographics

Categor y	Group	n	Purchased without prescriptio n (%)	Stopped when feeling better (%)	Shared antibiotic s (%)	Comple ted full course (%)	Purchased without prescription (n)	Stopped when feeling better (n)	Shared antibiot ics (n)	Comple ted full course (n)
Gender	Male	234	60	47	52	30	140	110	122	70
	Female	166	55	44	47	35	91	73	78	58
Age Group	18-30	168	65	50	55	28	109	84	92	47
	31-45	120	60	45	50	30	72	54	60	36
	46-60	72	50	40	45	35	36	29	32	25

Category	Group	n	Purchased without prescription (%)	Stopped when feeling better (%)	Shared antibiotics (%)	Completed full course (%)	Purchased without prescription (n)	Stopped when feeling better (n)	Shared antibiotics (n)	Completed full course (n)
Residence	>60	40	40	35	35	38	16	14	14	15
	Urban	160	48	40	45	38	77	64	72	61
	Rural	240	63	50	53	28	151	120	127	67

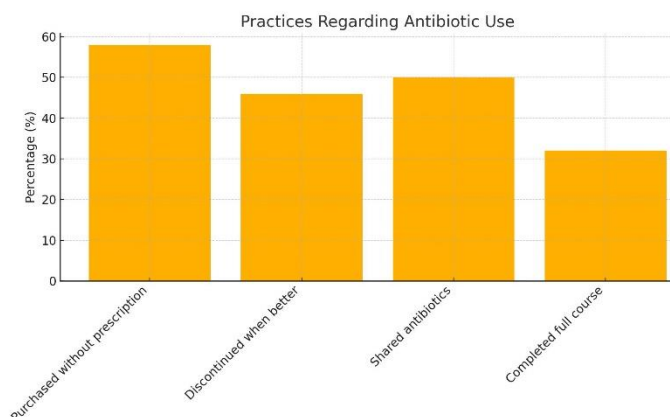


Figure 1 Practice Regarding Antibiotic Use

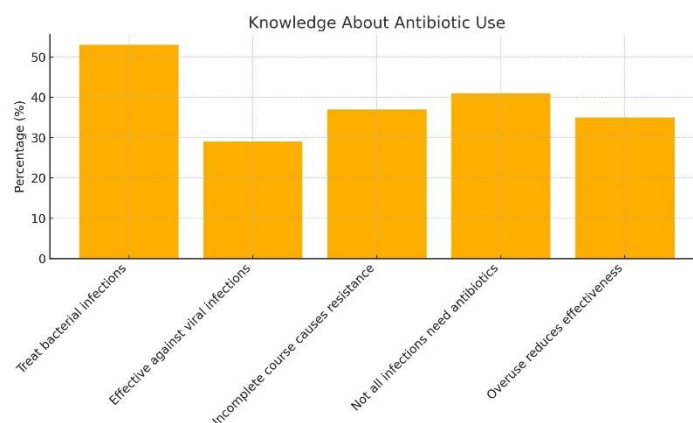


Figure 2 Knowledge About Antibiotic Use

DISCUSSION

This study provided a detailed assessment of knowledge, attitudes, and practices related to antibiotic use among community pharmacy visitors in District Tharparkar, Pakistan, revealing substantial gaps that contribute to the escalating issue of antimicrobial resistance at the community level (15,16). The findings are particularly concerning in the context of a rural, underserved population with limited access to regulated healthcare services, underscoring the systemic factors that shape irrational antibiotic use. A key insight from the study was that although 53% of participants correctly understood that antibiotics are used to treat bacterial infections, nearly one-third (29%) mistakenly believed that antibiotics are also effective against viral illnesses such as the common cold or flu. This misconception remains consistent with observations reported in studies from other South Asian regions, including Karachi and India, where similar public misbeliefs have been documented (17). Such misunderstanding has a direct impact on self-medication practices and drives unnecessary consumption of antibiotics, which in turn fosters resistance development. In terms of awareness of antibiotic resistance, only 37% of respondents understood the link between incomplete antibiotic courses and the emergence of resistance. This limited awareness has also been reported in community-based studies from Nepal and Bangladesh, where low literacy and fragmented public health education contribute to inadequate understanding of resistance mechanisms (18,19). The relatively poor knowledge on this subject, despite the widespread availability of antibiotics, signals a critical gap in public health communication strategies.

Attitudinal patterns observed in this study further reinforce these concerns. Nearly half of the participants (48%) believed it was acceptable to discontinue antibiotics once symptoms improved, while 44% considered it acceptable to purchase antibiotics without medical consultation. These findings align with previously reported behaviors from rural Pakistan and India, where accessibility and lack of healthcare supervision often normalize over-the-counter antibiotic acquisition and incomplete treatments (20). Furthermore, 52% of participants admitted to saving leftover antibiotics for future use, reflecting a high level of personal stockpiling and non-professional reuse, which compounds the problem. The practical implications of these findings are severe. A total of 58% of respondents had purchased antibiotics without a prescription in the past year, and 46% had stopped taking them once they felt better. These figures mirror those found in other South Asian contexts and emphasize how community pharmacies are often de facto health providers, functioning

without the necessary professional oversight or regulatory controls (21,22). Such widespread misuse, especially in low-resource settings, accelerates the evolution and community spread of resistant bacterial strains.

An encouraging aspect of the study was the positive correlation between education level and more rational antibiotic behaviors. Participants with secondary education or higher demonstrated significantly better knowledge and practices, aligning with previous research that emphasizes education as a cornerstone of effective antimicrobial stewardship (23). This finding supports the need for public health programs that prioritize education as a tool to improve responsible antibiotic use. The study's strengths lie in its localized focus, capturing real-world data from an underrepresented rural district, and its comprehensive assessment of KAP domains. However, limitations must be acknowledged. As a cross-sectional study, it provided only a snapshot of behaviors and knowledge at a single point in time, with no capacity to assess trends or causality. The use of convenience sampling, while practical in resource-limited settings, may have introduced selection bias and limits the generalizability of findings beyond the study area. Self-reported data also carry inherent risks of recall and social desirability bias, potentially underestimating harmful practices. Despite these constraints, the study contributes valuable evidence to the broader discourse on antimicrobial resistance in low- and middle-income countries. It emphasizes the critical role of community-based interventions that combine regulatory enforcement with culturally adapted educational outreach. Training programs for pharmacy staff, public awareness campaigns through mass media, and integration of antibiotic stewardship content in school curricula are practical strategies that can be tailored to rural populations. Future research should explore the impact of these interventions longitudinally and assess their scalability across different geographic and sociocultural contexts. Strengthening policy enforcement to restrict non-prescription antibiotic sales and investing in pharmacist capacity building remain essential to address the root causes of irrational antibiotic use in community settings.

CONCLUSION

This study concludes that there are critical deficiencies in public knowledge, attitudes, and practices concerning antibiotic use among community pharmacy visitors in District Tharparkar. These gaps not only reflect a lack of awareness but also signal systemic issues in healthcare accessibility and regulation. The findings underscore the urgent need for comprehensive community-based education, reinforced regulatory measures on antibiotic dispensing, and empowerment of pharmacy staff through training and oversight. By addressing these challenges, meaningful progress can be made toward promoting rational antibiotic use and mitigating the threat of antimicrobial resistance at the grassroots level.

AUTHOR CONTRIBUTION

Author	Contribution
Asif Ali Soomro	Substantial Contribution to study design, acquisition and interpretation of Data
	Critical Review and Manuscript Writing
	Has given Final Approval of the version to be published
Ahsan Ali Memon	Substantial Contribution to acquisition and interpretation of Data
	Has given Final Approval of the version to be published
Hira Jamil	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Bilal Mustafa	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Anzar Latif	Substantial Contribution to study design and Data Analysis
	Has given Final Approval of the version to be published
Sher Muhammad Nuhrio	Contributed to study concept and Data collection

Author	Contribution
	Has given Final Approval of the version to be published

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