

Sustainable Antibiotic Use: Community Behaviors in Course Completion, Self-Reuse, and Disposal Practices

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ABSTRACT

Background: Improper use of leftover antibiotics contributes to the development of antimicrobial resistance (AMR) and environmental contamination, creating substantial challenges for sustainable public health and the integrity of the microbial ecosystem. Understanding community practices related to antibiotic use, reuse, and disposal is essential for strengthening antibiotic stewardship efforts and reducing associated ecological risks.

Objective: To assess community practices regarding leftover antibiotics use, self-reuse, and disposal behaviors, and to evaluate their implications for environmental sustainability.

Methods: A cross-sectional survey was conducted using a structured questionnaire to assess patterns of antibiotic course completion, retention of leftover medications, perceptions regarding self-reuse, and disposal practices. Associations between education level and sustainability-related antibiotic behaviors were analyzed using the chi-square test in SPSS version 26.

Results: Out of 385 participants, a substantial proportion of participants (28%) reported not completing their prescribed antibiotic courses, often due to early symptom resolution (66%). Many retained leftover antibiotics (48%), with a notable portion indicating self-reuse without professional consultation (27%), were influenced by previous experiences. Among participants, the majority of expired antibiotics were disposed of in household trash (76%), followed by flushing down the toilet (10%). Smaller proportions of participants did not dispose of them at all (6%), others returned to a pharmacy or take-back program (5%), and donated to others (3%). Awareness of proper disposal programs was higher in urban residents ($p = 0.009$), but overall knowledge of sustainable antibiotic handling remained limited.

Conclusion: Community practices regarding leftover antibiotics reveal significant gaps in sustainable stewardship, which may contribute to environmental contamination and disruption of microbial ecosystems. Enhancing public education, improving access to safe disposal programs, and incorporating sustainability principles into antimicrobial stewardship initiatives are critical for mitigating these impacts. These findings highlight the importance of a One Health-oriented, sustainability-focused approach to antibiotic use and disposal.

Keywords: Antibiotic Disposal, Antimicrobial Stewardship, Environmental Sustainability, Self- Reuse.

REFERENCES

1. Khan K, Zaman A, Hashmi FK, Khan R. A Population based Study on Self Medication Practice in Pakistan. *Al-Kindy College Medical Journal*. 2022;18(2):90-5.
2. Tang KWK, Millar BC, Moore JE. Antimicrobial resistance (AMR). *British Journal of Biomedical Science*. 2023;80:11387.
3. Shahid S, Zulfiqar K, Butt K, Yousaf I, Shabbir A, Zaheer E, et al. Systematic review of the self-medication practice among medical students across South Asian countries. *Medical Science*. 2024;28:e23ms3314.

4. Sitotaw B, Philipos W. Knowledge, Attitude, and Practices (KAP) on Antibiotic Use and Disposal Ways in Sidama Region, Ethiopia: A Community-Based Cross-Sectional Survey. *The Scientific World Journal*. 2023;2023(1):8774634.
5. Marwa KJ, McHaro G, Mwita S, Katabalo D, Ruganuza D, Kapesa A. Disposal practices of expired and unused medications among households in Mwanza, Tanzania. *PLoS One*. 2021;16(2):e0246418.