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Improper disposal of medications in Brazil: Risks to water and soil quality

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Abstract

INTRODUCTION: The improper disposal of medications is a widespread practice in Brazil, posing serious risks to both the environment and public health. Pharmaceutical residues discarded in regular household waste or directly into sewage systems can contaminate soil and water bodies, persist in the environment, and affect aquatic organisms, soil microbiota, and, indirectly, human health. Despite its relevance, this issue remains largely overlooked in public policies and daily practices. **OBJECTIVE:** This study aimed to assess the knowledge, practices, and perceptions of the Brazilian population regarding the disposal of expired or unused medications, with emphasis on the environmental risks associated with soil and water contamination. **METHODOLOGY:** The research was conducted through an online questionnaire developed in Google Forms and disseminated via social media. The sample included 1.019 participants from different Brazilian states. The questionnaire addressed sociodemographic data, disposal habits, awareness of collection points, and perceptions about environmental impacts. **RESULTS:** Among participants, 70.7 % were female and 54.5 % were aged between 18 and 30 years. Regarding education, 28 % had incomplete higher education and 28.8 % had completed secondary education; 39 % reported a monthly income between USD 400 and USD 1000. As for disposal practices, 71.5 % discarded medications in household waste, 23.2 % used appropriate collection points, and 5.4 % kept unused medications at home. Packaging was also mostly disposed of in regular waste (71.8 %), with only 18.2 % being recycled. A lack of knowledge was evident: 58.4 % had never heard about proper medication disposal, 70.7 % were unaware of collection points in their city, and 80.3 % had never received formal information on the topic. The main reasons for correct disposal included preventing accidental poisoning (40.8 %), avoiding environmental contamination (35.8 %), and preserving public health (18.1 %). The most trusted sources of information for proper medication disposal were healthcare professionals (67.8 %), followed by the media (18.4 %) and government campaigns (13.7 %). **CONCLUSION:** The findings reveal a significant lack of public awareness and infrastructure for medication waste management in Brazil. Improper pharmaceutical disposal poses risks to environmental and human health. Urgent national policies are needed to promote environmental education, expand collection systems, and engage healthcare professionals in public outreach and risk communication.

Keywords: Environmental contamination, medication disposal, public awareness, waste management