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Original Research Article

Knowledge, Attitude, Practices Survey for Disposal of Medicines among Healthcare Professionals

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Abstract:

Introduction: Eco-pharmacology addresses the critical issue of health hazards associated with the improper disposal of unused or discarded medicinal products in the environment. The rising incidence of diseases, along with the easy accessibility of over-the-counter medications, contributes to the accumulation of surplus medicines and their inadequate disposal, resulting in significant environmental contamination.

Aims and Objectives: To assess the knowledge, attitudes, and management practices of healthcare professionals regarding the disposal of medicines and pharmaceutical waste management.

Materials and Methods: A questionnaire-based study was conducted using a structured Google Form, distributed via online platforms. The study involved 92 participants including doctors, pharmacists, nursing staff, lab technicians and medical students from various healthcare facilities. A 11-question questionnaire was shared with participants. The data were compiled using Google forms, and the results were analyzed.

Results: The findings indicated that 83.7% of participants viewed expired medications as unsafe, with 64.1% acknowledging their reduced effectiveness and 31.5% considering them potentially toxic. Awareness of the consequences of improper disposal was high at 97.8%. Additionally, 59.8% were familiar with various disposal methods, and 96.7% reported adherence to biomedical waste management protocols. Furthermore, 48.9% were aware of national take-back policies in certain countries.

Keywords: Eco-pharmacology, Drug disposal methods..

Introduction

Medications are chemical agents used to treat diseases, alleviate symptoms of specific conditions, or prevent illnesses. While they are essential to healthcare, advancements in medical science has led to a significant rise in drug waste. This increase is largely due to a growing patient population and irrational overprescribing practices by healthcare professionals. Thus, resulting medication waste raises ethical concerns and poses environmental challenges [2,3]. Eco-pharmacology addresses the global issue of health risks posed by discarded or unused medications in the environment. Raising awareness about the proper disposal of expired and unused medications is essential. Despite the availability of pharmaceutical waste management guidelines, awareness among consumers and many healthcare professionals remains low about safe disposal practice of medications. For instance, some people pour liquid medications down toilets or sinks, which can lead to environmental pollution, particularly by contaminating waterways and harming aquatic life, as well as posing risks to humans and animals [4]. Some dispose off medications by simply throwing them in the trash, which can pose serious dangers if ingested by animals.

Additionally, keeping unnecessary medications at home is highly risky, as it could lead to accidental intake by children [5].

Research indicates that attitudes toward medication disposal vary among healthcare providers. Common obstacles to proper disposal include insufficient training, unclear guidelines, and limited access to disposal facilities also lack of comprehensive waste management policies in healthcare settings is a major contributing factor.

Materials and Methods:

Study Design: This was a descriptive, cross-sectional study conducted using a questionnaire to assess the knowledge, attitudes, and management practices of healthcare professionals regarding the

disposal of medicines and pharmaceutical waste management.

Study Participants: The study included healthcare professionals such as doctors, pharmacists, nursing staff, laboratory technicians, and medical students from various healthcare facilities.

Study Method: The study utilized google forms as an online workup sheet to assess the knowledge, attitudes, and practices of participants regarding medication. A total of 92 participants voluntarily took part in the study.

Study Duration: The study was conducted over a period of two months, beginning from the date of ethical approval.

Statistical Analysis: Data was analyzed and presented as percentages. The results were recorded in Google Sheets and Excel, with visual representation through bar and pie charts.

Results:

Table 1:

Questionnaire-	**Yes (%)**
1.Is it safe to take expired medication	6.5%
2.Will medicine loose its effect after its expiry date	64.1%
3.Does improper waste disposal affect environment and health	94.6%
4.Do you instruct your subordinate for proper medicine disposal	96.7%
5.Are there different methods of disposal used for different drug formulations	94.6%
6.Are you aware of the national take back intitative of unused medicine	48.9%
7.What do you do with the unwanted medicine	
Throw in trash	12%
Set them on fire	8.7%
Flush them	5.4%
Dispose in disposable bags	73.9%
8.Burning is a disposable method for which of the following	
Tablet/Capsule	59.8%
Liquid formulations	9.8%
Do not know	30.4%
9. How to minimize the hazardous effect of unused and expired medicine	
Decreasing irrational prescribing	46.7%
Donating unused medicine	10.9%
Proper guidance of disposable practice	42.4%

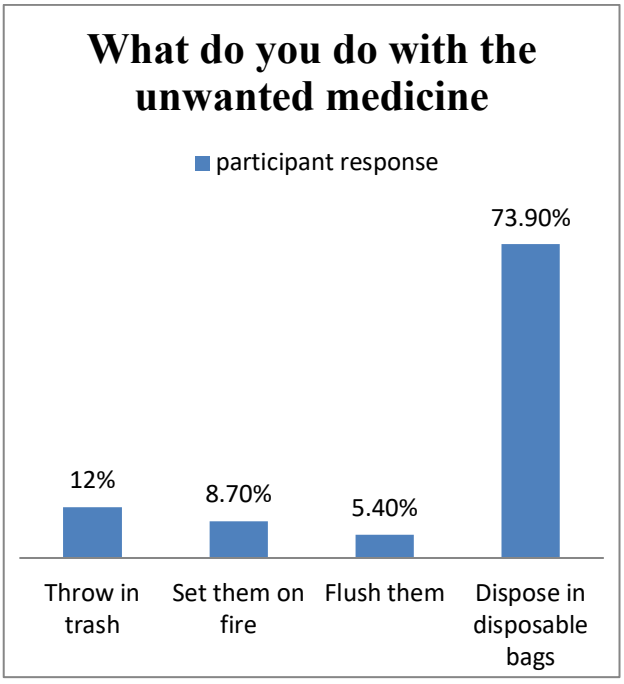

Figure 1: What do you do with the unwanted medicine

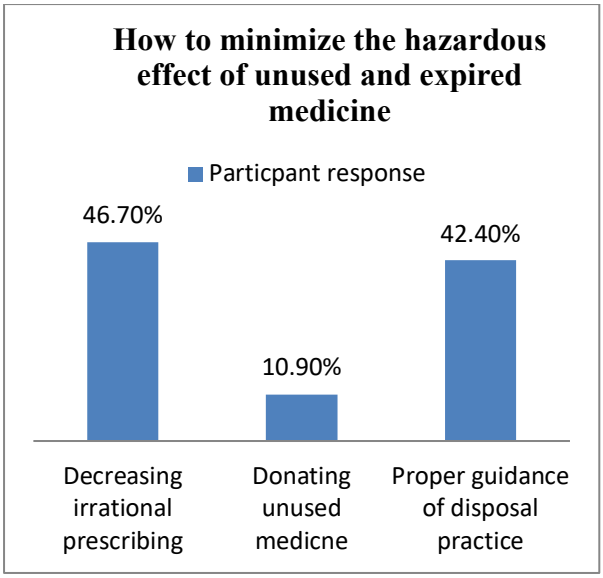

Figure 2: How to minimize the hazardous effect of unused and expired medicine

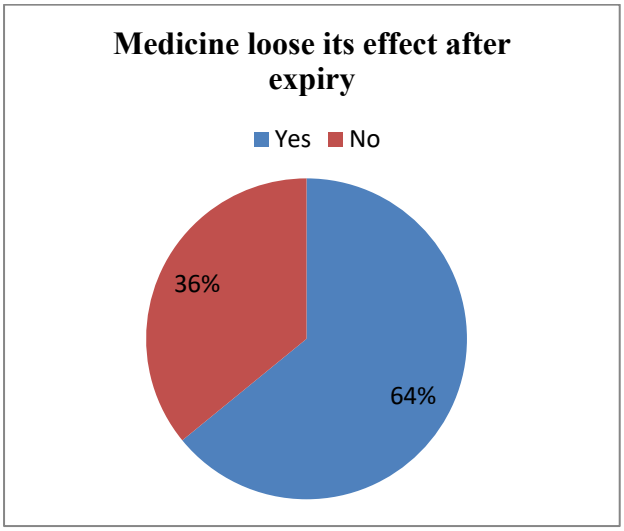

Figure 3: Medicine loose its effect after expiry

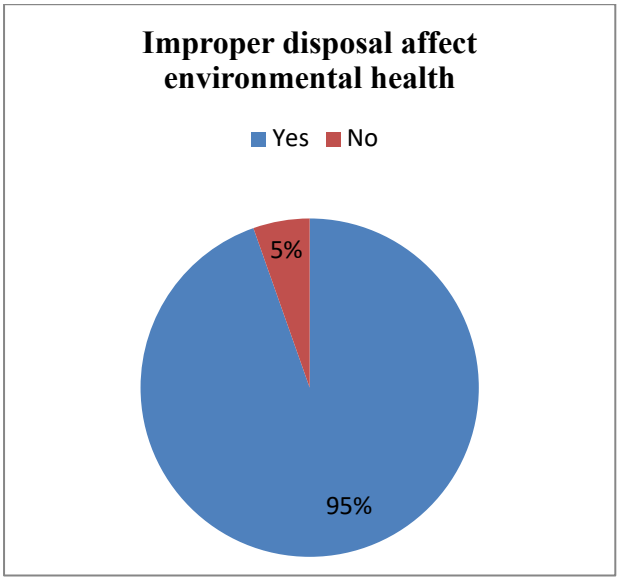

Figure 4: Improper disposals affect environmental health

The study found that a large majority (83.7%) of participants considered expired medications to be unsafe. Additionally, 64.1% recognized that medicines could lose their effectiveness after their expiry date, while 31.5% believed they could become toxic. Almost all participants (97.8%) were aware of the risks associated with improper or irrational use of medicines, particularly antibiotics, such as the development of resistance. When asked about methods to reduce the hazardous effects of unused medicines, 38% preferred prescriptions focussed solely on treatment, while 42.4% favoured providing proper guidance to consumers as a better approach.

Over half of the healthcare professionals (59.8%) were familiar with various medication disposal methods, and 96.7% expressed a willingness to follow biomedical waste management protocols for disposal. When asked about their personal preferences, 73.9% stated they would prefer to use disposal containers for their unwanted medicines.

Furthermore, 94.6% believed that improper disposal of drugs presents a significant environmental threat. An overwhelming 93.2% felt that both healthcare professionals and government bodies should share responsibility for raising awareness and promoting proper disposal practices. Interestingly, 48.9% of participants were aware of the national drug take-back policies in some countries.

Discussion

Numerous studies have looked into how much each nation knows about pharmaceutical waste. A study conducted in Riyadh, Saudi Arabia, revealed that almost 65 percent of participants in the study keep medications until they expire, 48.1% dispose of medications in the home trash, and just 5.4% return medications to pharmacies [6]. Only 2.98% of participants to a different study in Jeddah returned expired medications to pharmacies whereases 91.57% disposed of expired medications with household rubbish [7].

In India, household garbage was found to be the most popular way of disposing of outdated or unwanted medications (67%), according to a survey conducted among 393 people (32% male and 68% female). Roughly 90% were aware of the dangers associated with improper chemical disposal and 67.1% , were found to have not used safe disposal techniques, and it was found that the respondents only had a limited understanding of appropriate drug disposal [9].

Meanwhile, around 95% of participants in a study conducted in Indonesia reported storing unused medications at home. More than 80% of study participants stated that discarding expired medications in household trash was the most common method of disposal. Over 50% were unaware that improper disposal of medications could negatively affect public health and the environment, and around 80% lacked knowledge about proper medication disposal methods [10]. Studies indicate that targeted initiatives can significantly impact how individuals manage unwanted medications. For instance, in the United States, only 2% of people initially returned unused medicines to pharmacies. However, over a decade, this figure increased to 23% [12]. Another study by Advani M. et al revealed that participants had satisfactory knowledge of ecopharmacology, with most (91.15%) aware of the environmental and health risks posed by improper disposal of unused and expired medicines. A significant majority (86%) recognized the link between environmental drug pollution, antibiotic resistance, and cumulative drug toxicity [13] whereas our study shows that almost 94% agreed that improper disposal practice affect environment.

Conclusion

The study found that medical professionals had relatively low levels of knowledge, attitudes, and practices (KAP) regarding medication disposal. Participants acknowledged their lack of information and recognized the need for specific programs focused on medication waste management. Several factors, including gender, age, education level, and profession (healthcare professionals), were found to be linked to higher KAP scores in various aspects of medication disposal. This highlights the importance of considering these factors when implementing targeted corrective actions. The study could serve as a foundation for developing a national strategy for medication waste management in India. From a research standpoint, it underscores the need to create a more comprehensive questionnaire to gain a deeper understanding of KAP related to the disposal of unused and expired medications among the general public, with plans to later expand it to assess biomedical waste management among healthcare professionals.

References

1. Cramer J. A., Roy A., Burrell A., et al. Medication compliance and persistence: terminology and definitions. Value in Health. 2008; 11(1):44–47.
2. Sonowal S, Desai C, Kapadia JD, Desai MK. A survey of knowledge, attitude, and practice of consumers at a tertiary care hospital regarding the disposal of unused medicines. J basic clin pharm. 2017; 8(1):4–7. Smith A, Jones B. Safe Medicine Disposal Practices in the Community. J Pharm Pract. 2017; 30(2):89-98.
3. Al-Khatib I. A., Khalaf A.-S., Al-Sari M. I., Anayah F. Medical waste management at three hospitals in Jenin district, Palestine.

Environmental Monitoring and Assessment. 2020; 192(1) doi: 10.1007/s10661-019-7992-0.
4. World Health Organization (WHO) Health-care waste. World Health Organization; 2018. https://www.who.int/news-room/fact-sheets/detail/health-care-waste .
5. Smale E. M., Egberts T. C. G., Heerdink E. R., van den Bemt B. J. F., Bekker C. L. Waste-minimising measures to achieve sustainable supply and use of medication. Sustainable Chemistry and Pharmacy. 2021
6. Wajid S., Siddiqui N. A., Mothana R. A., Samreen S. Prevalence and practice of unused and expired medicine-A community-based study among Saudi adults in Riyadh, Saudi Arabia. BioMed Research International. 2020; 2020:1–5. doi: 10.1155/2020/6539251.
7. Abuassonon A. A., Alzahrani L. S., Eid B. G., Neamatallah T. A. Practices of jeddah residents regarding the disposal of unused and expired medications: a community-based survey. Journal of King Abdulaziz University - Medical Sciences. 2019; 26(2):35–44. doi: 10.41 97/med.26-2.4.
8. Abahussain E., Waheedi M., Koshy S. Practice, awareness and opinion of pharmacists toward disposal of unwanted medications in Kuwait. Saudi Pharmaceutical Journal. 2012; 20(3):195–201.doi:10.1016/j.jsps.2012.04.001.
9. Manocha S., Suranagi U. D., Sah R. K., et al. Current disposal practices of unused and expired medicines among general public in Delhi and national capital region, India. Current Drug Safety. 2020; 15(1):13–19. doi: 10.2174/1574886314666191008095344.
10. Insani W. N., Qonita N. A., Jannah S. S., et al. Improper disposal practice of unused and expired pharmaceutical products in Indonesian households. Heliyon. 2020; 6(7):e04551–10. doi: 10.1016/j.heliyon.2020.e04551.
11. Chung K., Boutaba R., Hariri S. Knowledge based decision support system. Information Technology and Management. 2016; 17(1):1–3. doi: 10.1007/s10799-015-0251-3.
12. Kuspis D KE. What happens to expired medications? A survey of community medication disposal. Vet Hum Toxicol. 1996; 38(1):48-9.
13. Advani M, Jadhao TR. A questionnaire based study on the knowledge, attitude, and the practice of ecopharmacology among the healthcare professionals in a teaching hospital in India. Int J Basic Clin Pharmacol 2019; 8:1413-8.