

# A Community Based Interventional Study to Assess the Knowledge, Attitude and Practice of Disposal of Medicines in Dakshina Kannada

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## ABSTRACT

The use of pharmaceuticals is increasing every year worldwide. Proper storage of medicines is essential for the stability of medications. Each medicine should be stored on the specified storage condition, otherwise leading to many harmful impacts and affects the drug stability.

An interventional study was carried out among the voluntary participants of Dakshina Kannada with a sample size of 150 with the help of Questionnaire and patient information leaflets (PIL). Informed consent has been obtained from voluntary study participants and the collected data was analyzed using Chi Square test and MS Excel 2017.

During the pre-interventional study, it was observed that improper storage of medications was found to be high which were found to be reduced during post intervention. The study emphasizes on bringing awareness to the community and to educate people about the proper storage of medications.

**Key words:** PIL (Patient Information Leaflet), storage, pre-intervention, post-intervention

## INTRODUCTION

Drug disposal refers to the process of discarding the drug after use.<sup>[1]</sup> The inappropriate methods used to discard the drugs lead to many health and environmental hazards. Most of the patients fail to consume the dispensed medications properly and discontinue after a temporary symptomatic relief. Hence the medicines are left over in households contributing to

medical waste.<sup>[2]</sup> The leftover medications at home are not properly discarded contributing to many health and environmental hazards. Unused and expired drugs at home often have a risk of accidental ingestion by the pets and children and also creates a confusion among the people who receive multiple drugs.<sup>[3]</sup> Expired medications are often discarded in the waste bins or are discarded in sewage which cause a serious threat to the normal flora and fauna. An example of such obliterations include is the development of Renal failure among the vultures, carcasses were contaminated with Diclofenac sodium resulting in kidney related issues.<sup>[4]</sup> Due to a lack of knowledge or a system for the proper disposal of unused medicines, people possessing those medicines may manage them in different ways.<sup>[5]</sup> Rinsing of unwanted medicines down a sink, flushing them down the toilet, and throwing them in the garbage was some of the most common disposal methods practiced.<sup>[6]</sup> The misuse and improper disposal of medications are a major safety and environmental concern, and therefore, the proper disposal of these medications is critically important. As storage and disposal of unused medicines vary in different settings, there is a need for evaluation of practices within diverse area.<sup>[7]</sup>

## MATERIALS & METHODS

A Community based interventional study was conducted among the voluntary participants residing in Dakshina Kannada for a duration of 6 months from January 2022 to June 2022. The study protocol was approved by the Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Science, Mukka, Mangalore. The study was limited for a sample of 150 based on the time schedule allotted for the project including other circumstances. The study criteria included male and female above 18 years of age and voluntary participants residing in Dakshina Kannada and excluded people of age less than 18 years, critically ill patients and patients who are not willing for the study.

Data(s) for the study were collected using pre validated questionnaires obtained filled by the participants and PILS were provided. The collected data was analyzed using Chi Square test and MS EXCEL 2021.

Samples were segregated based on inclusion and exclusion criteria and the Informed consent form was obtained from the selected patients in English and Kannada. Pharmacist intervention was provided with Patient Information Leaflet (PIL). After reviewing the scores of questionnaires, the samples were followed up after few days. The PIL was used to educate the patients about the practice of self-medication, storage and disposal of medication. Information provided by people was the source of data collection.

## RESULTS

### DEMOGRAPHIC DETAILS OF THE STUDY PARTICIPANTS:

Out of the 150 participants (52% female and 48% male), 4(3%) were of the age groups of 18-20, 52(35%) of age groups 21-30, 44 (29%) of age groups 31-40 and 50 (33%) were above 41.

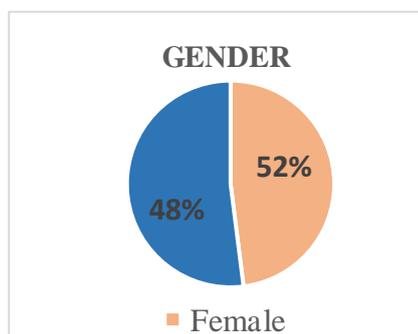


Fig. 01: Gender Distribution

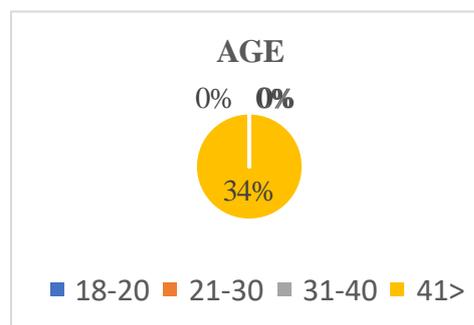


Fig. 02: Age Distribution

### HANDLING OF UNUSED/EXPIRED MEDICATIONS:

During the Pre interventional study, the major disposal practice was throwing into garbage 83(55%), followed by flushing down in toilets and sinks 15 (10%), 34(23%) responded that they burn it, 3(2%) crushed the drugs and 15(10%) had practiced safe disposal practice. While during the Post Interventional study, the

major practice of throwing into garbage has reduced to 46 (30.8%), 4(2.6%) practiced flushing down in sinks and toilets, 6 (4%) practiced burning, 1(0.6%) crushed the drugs and 93(62%) of the people switched to safe disposal practice. According to Chi Square test, P value was significant at <0.00001. Hence the pharmacist intervention was useful.

Table 01: Handling of unused/ Expired medication

HANDLING OF UNUSED OR EXPIRED MEDICINES	PRE- INTERVENTION	POST INTERVENTION	P VALUE
Burn	34(23%)	6(4%)	
Crush the drugs	3(2%)	1(0.6%)	

Flush down in sinks and toilets	15(10%)	4(2.6%)	<0.00001
Safe disposal practice	15(10%)	93(62%)	
Throw in garbage	83(55%)	46(30.8%)	

**REASONS FOR POSSESSION OF UNUSED MEDICATIONS AT HOME:**

- About the reason for possession of unused medications, 60(40%) out of 150 participants did not store any unused drugs, 11(7%) responded due to passing of expiry date, 29 (19%) responded due

to left over from previous OTC drugs, 16(11%) responded due to change in treatment, 10(7%) responded that they discontinued after condition resolved and 4(3%) mentioned they had adverse effects from previous drugs.

**Table 02: Reasons for Possession of Unused Medication at Home**

REASONS FOR POSSESSION OF UNUSED MEDICATION AT HOME	PERCENTAGE (%)
Doctors changed treatment	16(11%)
Prescribed more than needed	20 (13%)
Self- discontinuation after condition resolved	10 (7%)
Leftover from previous OTC drugs	29 (19%)
Passed expiry date	11 (7%)
Adverse effects from previous drugs	4 (3%)
Not Applicable	60 (40%)

**OPINION ON NEED TO COLLECT UNUSED MEDICATIONS AT HOME**

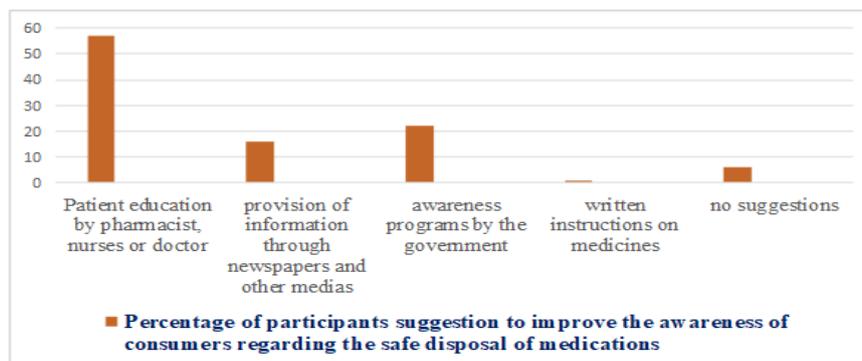
When people were asked about their opinion on the need for a program to collect unused medications at home,109(73%) responded

Yes and 41(27%) responded No during the pre-interventional study whereas 115(77%) responded Yes and 35(23%) responded No during the post Interventional Study.

**Table 03: Participants opinion on need for a program to collect unused medn.**

PARTICIPANTS OPINION ON NEED FOR A PROGRAM TO COLLECT UNUSED MEDICATIONS AT HOME	PRE INTERVENTION	POST INTERVENTION
YES	109(73%)	115(77%)
NO	41(27%)	35(23%)

**SUGGESTIONS TO IMPROVE THE AWARENESS OF CONSUMERS REGARDING SAFE DISPOSAL OF MEDICATIONS:**



**Fig. 02: Patient suggestion assessment regarding safe disposal of medication.**

**BEST METHOD FOR DRUG DISPOSAL AS PER THE PARTICIPANTS:**

During the Pre interventional study, on questioning about the best method of disposal of medication, 74 (49%) responded for Returning to a pharmacy, if possible, 56(38%) responded throwing into garbage, 11(7%) responded rinsing down a

sink and 9(6%) responded flushing in toilets. Whereas during the Post interventional study, 122(81%) responded to Returning to Pharmacy, if possible, 18(12%) throwing into garbage, 6(4%) flushing down a toilet, and 4(3%) rinsing down a sink. According to Chi square test, P value was significant at <0.00001, indicating pharmacist intervention was useful.

Table 04: Best method for disposal of drugs.

BEST METHOD FOR DISPOSAL OF DRUGS	PRE- INTERVENTION	POST INTERVENTION	P VALUE
Flush down in toilets	9 (6%)	6 (4%)	<0.00001
Returning to Pharmacy, if possible	74 (49%)	122 (81%)	
Throw into garbage	56 (38%)	18 (12%)	
Rinsing down a sink	11 (7%)	4 (3%)	

**DISCUSSION**

Drug disposal refers to the process of discarding the drugs after use. Most of the patients fail to consume the dispensed medications properly and discontinue after the temporary symptomatic relief leading to many health and environmental hazards.<sup>[8]</sup>

A Community based interventional study was done to assess the knowledge, attitude and practice of disposal of medications in Dakshina Kannada to improve the knowledge among the community and to educate about the hazardous effects of improper disposal of medications. There is a lack of pharmaceutical care among the community after the patient consume the medications once it is prescribed.<sup>[9]</sup> The overall knowledge of the participants significantly increased after the Post interventional study. A similar result was found in a study authored by Lai PS titled “Effectiveness of an intervention to increase the knowledge, attitude and practice regarding the return and disposal of unused medications”.<sup>[10]</sup>

As per the Pre interventional study, the most common method of disposal of medicines was Returning to pharmacy, if possible (50%), followed by Disposal in the garbage (38%) and Flushing down in sinks and toilets (5%) and 7% Rinsing in the sink, which is strongly supported by an article authored by Aeshah Alazmi titled “Patients knowledge and attitude towards the disposal

of medications”.<sup>[11]</sup> There is no proper guidelines for the safe disposal of unused medicines. So according to the study conducted, the people were suggested to dispose the leftover medicines by safe disposal practice i.e., mixing it with any inert substances such as cement, mud etc and then dispose the sealed packet in the trash. However, during the Post interventional study, 81% responded that they did Safe disposal practice whereas the other common practices such as throwing into garbage and flushing in toilets have drastically reduced. According to the study, when asked about the suggestions for best method of disposal of medications, majority of respondents suggested returning to pharmacy, if possible. This method is not accepted in many developing countries including India.<sup>[12]</sup> Hence there is a lack of proper method for the disposal of medications among the people. In a similar study titled “Outdated and unused medicine disposal practice among the undergraduate paramedical students, it was observed that majority of the participants were unaware of the proper disposal practices. But after pharmacist intervention, it was showed a 31% improvement in the proper disposal practice of medications.<sup>[8]</sup> The study and data were then analysed using MS Excel 2021 with the help of Chi Square test. When the Chi Square test was conducted, it gave a satisfactory result as expected. The

knowledge of majority of the people were improved after they were educated about the importance of proper storage and disposal of medications. After education, the people were aware of the harmful effects of inappropriate practice of self-medication. The data were found Significant according to Chi Square test, with P Value <0.00001.

## CONCLUSION

Most of the people were not aware about the importance of proper storage of drugs. People were educated about the proper storage condition of drugs with the help of Patient Information Leaflet. Hence there was a significant improvement in the knowledge of people about the proper storage of drugs. There was an improved response from the participants regarding the practice of proper storage and safe disposal of medications. The study suggests that there is an immediate requirement for the establishment of WHO guidelines for the proper disposal of unused and leftover medications. A policy should be made among the pharmacy department for returning the medications from the people. No information was provided to the public for the safe storage and disposal of medications. Safe disposal instructions should be provided by the health professionals in the routine patient education.

## Declaration by Authors

**Ethical Approval:** Approved

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**Conflict of Interest:** The authors declare no conflict of interest.

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