

A Qualitative Study on Knowledge, Attitude and Practice of Drug Waste Management among Community Pharmacists

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ABSTRACT:

Drugs are chemicals which have unwarranted ill effects on biological systems when dropped or when released without any precautions can have gratuitous effects on the environment. Thus, drug waste has become an imperative part in polluting the environment. This study was conducted with an aim of identifying knowledge and awareness of the pharmacies in proper drug waste management. A questionnaire survey and key informant interview were used for the study. A face-to-face interview method was used by filling up questionnaires. The study comprised of pharmacies from various areas of Ernakulum district. The participants were asked about their practice, knowledge and difficulties faced in the area of safe waste drug disposal. The filled questionnaires collected from 60 pharmacies were sorted and examined for accuracy. Most of the pharmacies had return of drug waste in the range of 5-10 kilograms per month. The solution for this issue of pharmaceutical waste disposal can be done in collaborative effort between government and all the stakeholders including public. Implementation of proper drug disposal regulations along with public awareness will surely make our goal simply workable.

Keywords: Drug, Waste disposal, knowledge, Pharmacies, Knowledge.

I. INTRODUCTION

Wastes are unwanted materials that people will no longer use. Pharmaceutical wastes can be cut strips, expired tablets, syringes, vials, ampoules which turns to hazardous. These wastes then become a burden to the environment and not only to humans but also causes harm to the living creatures. Some group of people takes medication even for a mild headache or cold, which indicates that the use of drugs is increasing. The drugs which are known as "over the counter drugs" does not require prescription for getting medications. Such self-medication led to the sale of OTC drugs in

large amount than that required. These drugs will be discarded by the people as it has expired and discarded to the landfills without proper precaution [1].

As we all know drugs are chemicals which can affect the biological system severely, when released without any precautions. The pollution that results from the disposal is very complex, since their structure consists of many active molecules and ultimately reaches the water bodies. The studies have revealed that these chemicals have caused some changes in behavior, growth, and reproduction of many water living species. Being the most accessible health care provider and medication expert, a pharmacist can provide vital information on proper drug use and its disposal. The community pharmacist does not play any role in proper waste disposal rather than packing the unused ones to the wholesale distributor [2]. Pharmacists can be a part by serving as drug-information resources for proper medication disposal, pharmaceutical collection events and drug-disposal programs.

This study was initiated with an objective to examine the knowledge and practices of community pharmacists in handling unused medicines and their safe disposal. Since we do not possess any proper guidelines towards medication disposal in our country, it has become a need to study the waste management area of pharmaceutical vicinity. The methods for proper waste disposal should be strictly followed by everyone and it is our responsibility to keep our environment safe and protected.

AIM:

The study was aimed to understand the knowledge and awareness regarding safe drug disposal systems among the community pharmacists.

OBJECTIVE:

- To examine the knowledge and practices towards unused and expired pharmaceuticals in community pharmacists.
- To increase awareness on safe disposal of pharmaceutical waste management

II. METHODOLOGY

Study Design:

The study comprised of a questionnaire survey and key informant interview. The study population comprised of registered pharmacist working in community pharmacies from various areas of Ernakulam district. We collected all the information on the disposal of unused and expired drugs as it concerns what might be argued are unethical as it can lead hazards to environment. The information collected by this survey can be used to evaluate the status of waste management in pharmacies. Though we have mentioned that we took steps to gain the trust of those we interviewed, there were some pharmacists that were uncomfortable to give us a complete picture of their practices. Face to face interview was employed. We assured that all their answers would be kept completely confidential, and that the information gathered was only intended to improve the waste management system. Pharmacists who gave their informed consent to participate in the study were allowed to participate. A questionnaire survey and key informant interview were used for the study. The pre-tested revised and adapted questionnaires were given by direct interview to the community pharmacies having registered pharmacists at the time of visit. The participants were asked questions about disposal of expired and unused medications. The study was conducted among pharmacies in the period of October 2019 to January 2020. The questionnaire was translated into the local language and back translated into English to avoid any misinterpretation. A face-to-face interview method was used by filling up questionnaires.

The questionnaire comprised questions for obtaining information on demographic details of respondent, years of experience in drug distribution, disposal practices toward unused and expired medications, whether they have any drug waste disposal policy or method in their centre and questions regarding the project 'PROUD' started by the state government for drug disposal system, lectures on pharmaceutical waste management to be incorporated in schools of pharmacy curriculum and the challenges to proper disposal practices and the recommendations. During the interview, only note-writing formats were used to collect data.

III. DATA ANALYSIS:

The questionnaire forms collected were sorted and examined for accuracy. The data were simplified, and the percentages of responses were noted to make the study more communicative.

IV. RESULTS AND DISCUSSIONS

Demographic details such as name of the organization, name of the registered pharmacist, level of education and length of practice as pharmacist were collected. Total 60 pharmacies were visited, and questionnaires were distributed. Participants were asked to answer the questions based on the drug waste disposal practices in pharmacy. The aim of the survey was to estimate the knowledge of community pharmacist in drug waste management and the survey also focused on the innovative ideas for complete and correct drug waste management to eradicate their environmental hazards.

Pharmacists plays a large role in the disposal of pharmaceutical waste by properly collecting and sending waste to appropriate disposal facilities. Pharmacies are a crucial location for proper collection and disposal because in addition to producing their own expired medicines when overstocked. Pharmacies and their disposal practices play a crucial role in the pharmaceutical waste management system.

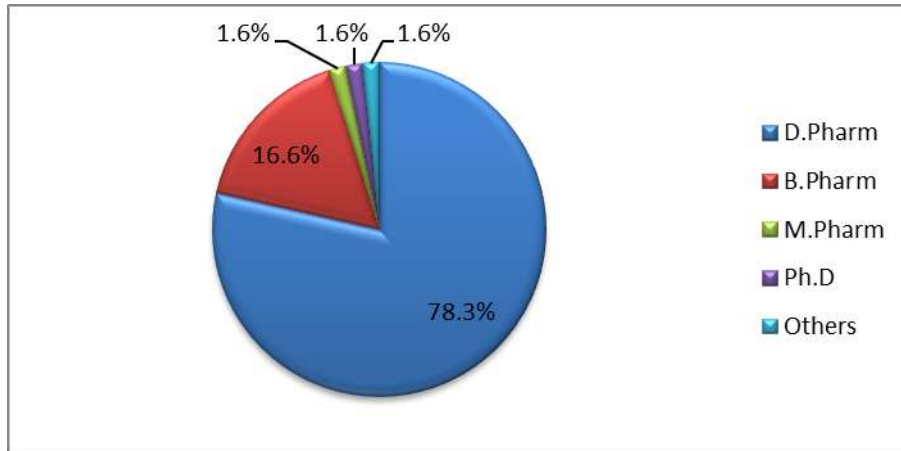


Figure 1: Qualification of the pharmacists

About 78.3% percentage of the pharmacies visited had pharmacist with diploma in pharmacy. Only 16.6% Bachelor of pharmacy owns a pharmacy among the total 60 pharmacies (Fig 1).

When we enquired about the awareness on drug waste and its environmental hazards all of them answered that they were aware about the safe management of drug waste, as they were having seminars and continued education programs and all of them know about the ill effects of unused medication. The pharmacist knowledge about the guidelines laid by the Government of India, for safe drug disposal of expired and unused medications was assessed and most of them were familiar with such guidelines. Even though they are aware of such guidelines they don't follow those. They just

want to perform a safe sideline in this qualitative study. They answered positively regarding drug disposal practices, but through the oral interviews, it was clear that they were not really concerned about drug waste management. We found that pharmacists lacked information about the laws and regulations that makes it very hard for them to comply. We received many different answers from the pharmacists about the laws. Many of the pharmacists claimed they knew and followed the law, while others claimed that they had not been given enough information.

The pharmacist knowledge about the guidelines laid by the Government of India, for safe drug disposal of expired medications reflected that most of them were familiar with guidelines (Fig 2).

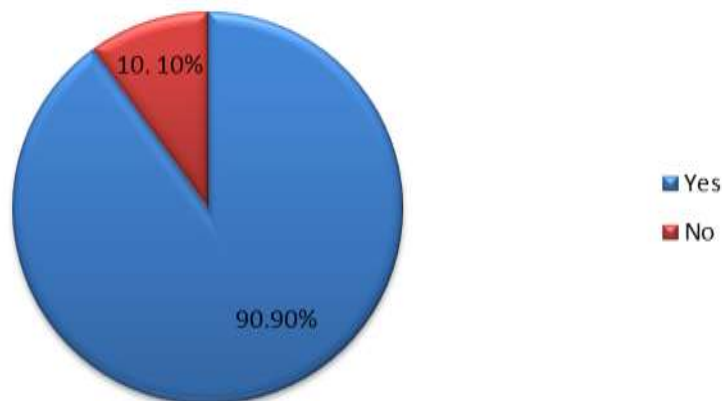


Figure 2: Knowledge of pharmacist

We checked whether these pharmacies had any own methods or policies for management of drug waste, and this showed that about 80% of

them did not have any such policies. The pharmacists and owner are not even concerned about the drug wastes generated in pharmacies

because most of the pharmacists are paid employees in pharmacy, because of these pharmacists are not at all interfere in disposable manner selected by the owners (Fig3). 18.33% were having policies, but they refuse to say what

kind of policy they have adopted for disposing drugs. Then discussions were conducted to determine the responsible person or organizations for the safe management of the unused and expired drugs.

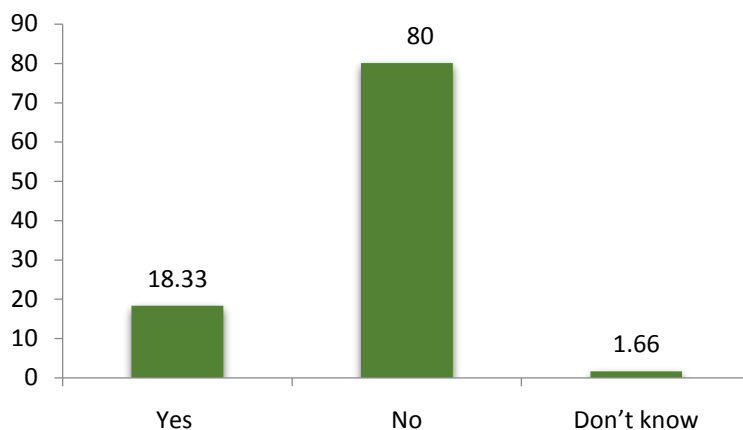


Figure 3: Enquiry on drug disposal policy

46.6% responded that it is the responsibility of the manufacturers. While 35% were of the opinion that it was the responsibility of government, one suggested that it is the responsibility of government, manufactures and teamwork of health. Some participants did not have any kind of view and they donot know the hazards caused by improper management of unused medication. It can often be safer to return the pharmaceutical waste to the original manufacturer (Fig 4). If they are properly separated and not yet expired, these drugs even have the potential to be reused by the manufacturer with proper chemical purification. As part of this project studies was conducted in Aluva region, Ernakulam which was destroyed by the flood in august 2018, the

pharmacies in the area were completely damaged and the drug stocks spilled away, at that time pharmacies in the area faced a huge crisis in eliminating waste drugs and devices. Neither the local government nor the distributors took any initiatives in its disposal, and then those drug wastes became the burden of the pharmacy owners. So, they themselves took the initiative to move those wastes from their premises, but it wounded the flooded earth more deeply. They refused to speak about the methods they opted in disposing those waste drugs, but through a continued interaction we came to know that they buried those waste drugs, and some owners burned it in their premises. But they were not ready to answer such questions in the questionnaires used in the survey.

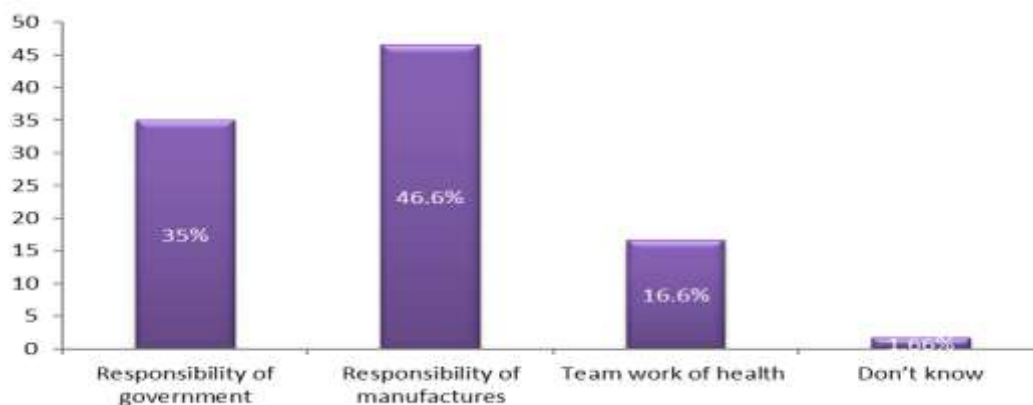


Figure 4: Responsibility of safe management of drugs

The fate of unused medication in pharmacy was studied. The result revealed that almost all ethical branded drug waste generated was collected back by the wholesaler or the distributor. But in case of generic drugs that cannot be returned to the wholesalers remain a burden to the pharmacies. From the study it was clear that the unused expired generic drugs were burned within the premises, or these drugs were given along with corporation waste. A less complex method for pharmaceutical waste management is incineration.

Incineration is the process of burning pharmaceuticals at temperatures upwards of 1,200°C. This method’s major benefit is that the pharmaceutical is prevented from entering the water supply. Another point of concern when burning pharmaceuticals is the possibility that toxic gases are produced and released into the environment. These toxic fumes can be absorbed into substances like activated carbon or cement clinker products to prevent them from damaging the atmosphere (Fig 5).

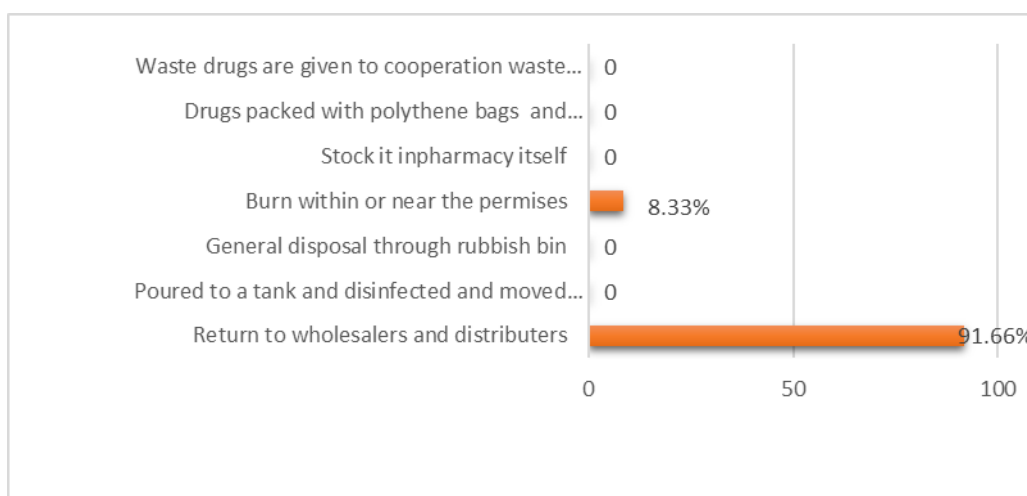


Figure 5: Fate of unused medication

Waste generation in pharmacies was enquired and 80% of pharmacies the drug wastes are generated which usually weighs about 5kg / month. Thought proper inventory control systems

some pharmacies prevent the generation of drug wastes. As the wholesalers refuse to take back the cut strips, they are more prone to produce waste once it gets expired.

WASTE GENERATED	PERCENTAGE %
YES	80
NO	20

Table 1: waste generation in pharmacy

Out of 80% of pharmacies, many said that they only had a small amount of waste. The pharmacies that were interviewed acknowledged that they did produce pharmaceutical waste (Table 1). Of those pharmacies, many said that they only had a small amount of waste. Throughout all the interviews, we found the word “small” to mean anything from two to four boxes of waste, two to three products, 30 tabs of expired medicine per month, or two small boxes. Individually these pharmacies produce an amount of waste they perceive as inconsequential but may not recognize that together the waste adds up to significant

amounts. But 20% said they do not have any kind of waste generation in their pharmacy.

Collections of unused medications by pharmacies from the customers were then discussed, majority responded that they collect unused and expired medication for safe disposal, and they suggest that the drug disposal methods should be improved. 71.6% of the pharmacy use to collect the expired drugs for the safe disposal and 28.3% does not collect any of the expiry drugs returned by the customers as it is burden for them to dispose (Fig 6).

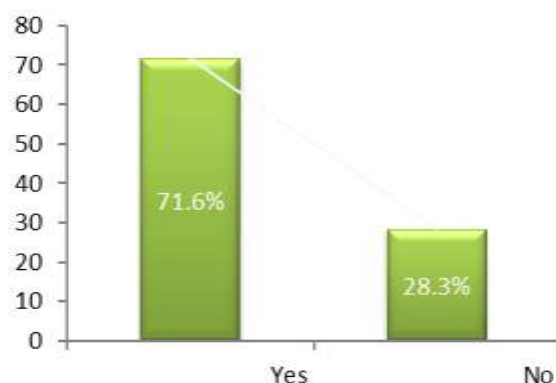


Figure 6: Collection of unused and expired medicines

Pharmacists have the potential to lead this movement as a healthcare professional who is aware about the drugs and its noxious affects and pharmacists are in an admirable position to educate patients about safe drug disposal. Possibility in donation of unused drugs through a pharmacy to any organizations or people in need were analyzed. Donating the drugs which are getting close to expiry could reduce the drug waste generation. But pharmacists do not have any legal rights for donation. Even though some pharmacists donate

some generic drug that will not be taken back by the wholesalers nor the distributors after getting expired, hence the pharmacists donate such drugs 2-3 months prior to the expiry date (Fig 7). Seeking the strategies by the distributors in collecting the drug wastes on a regular basis, it was found that the ethical drugs were taken back by the wholesalers and generic drugs were not collected back and gets accumulated and becomes a burden to the pharmacies.

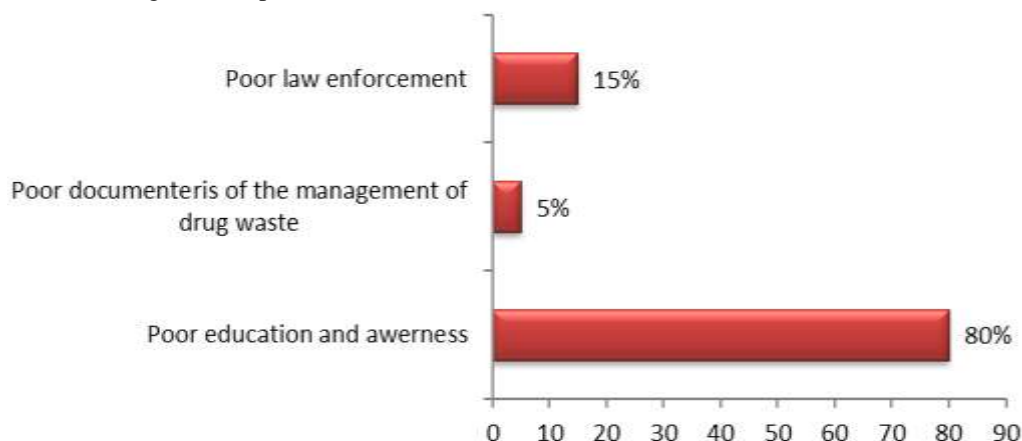


Figure 7: Common challenge in proper disposal of drugs

Next, we probed to know who is responsible in creating awareness for proper drug disposal. Most of the pharmacist suggested that it is the responsibility of government and manufacturers for proper disposing of unused and expired drugs. Pharmacists have the thought that the drug waste disposal is the responsibility of the pharmacy owner as they are an employee in the firm, so they

are not bothered about the disposal methods. Pharmacist knowledge about the health issues generated by the drug waste exposed to environment was enquired and the result reflected that all of them were aware about the health issue. Even though they were aware about the toxic effects of drugs when exposed to the environment, they were unaware about the odds of producing

antibiotic resistance by the antibiotic content in the and soil. Up on enlightened of the hazards they were curious to know more on the topic.

On enquiring whether they felt an improvement is necessary in the current waste disposal system, the majority (83.3%) of them replied that it is necessary to initiate some methods that can be followed by the pharmacies and other health care system; while the others answered that they didn't feel it necessary.

The opinion on whether to incorporate lectures on "pharmaceutical waste management" in

pharmacy school curriculum shows that all the key participants approved on the need to introduce lectures on pharmaceutical waste management in schools of pharmacy curriculum which revealed that standard ways to handle unused drugs should be taught. The major expired drugs were kept around was that they do not know how to dispose of it. This can lead to serious consequences on the general safety of the environment due to a lack of basic knowledge on the appropriate method of medication disposal.

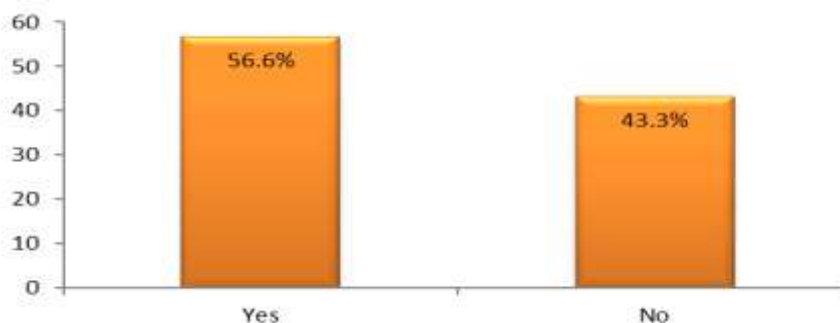


Figure 8: Requirement of lectures on pharmaceutical waste management in pharmacy curriculum

The employees of pharmacy commended that lectures would be an ideal way to educate the young generation and about 56% of the pharmacist approved for lectures and 43.3% of them said that it is not necessary because drug waste management is the responsibility of concerned authorities (Fig 8). They also made the suggestion that public should also be made aware of the consequences of drug waste and its management.

V. CONCLUSION

Drug waste management is one of the major problems faced by our country today. This cannot be managed like other waste, and it needs proper waste management system. There should be a standard and efficient method for drug waste management to sustain the environment. As a part of this the project "PROGRAMME FOR REMOVAL OF UNUSED DRUGS" (PROUD) was implemented by 'All Kerala Chemists and Druggist Association' (AKCDA) a solution for the disposal of unused and expired drugs by government of Kerala. This study aimed to review the disposal procedures involved in community pharmacies. The first step to proper drug waste management is to minimize the production of drug waste. Self-medication and OTCs make up a large part of individual drug waste at home. Consumers should be educated on rational use of drugs along

with their ill effects when used irrationally. Proper patient counseling can make a significant difference in this arena. Prior to that, the pharmacist should be made aware on the drug waste management and about the approaches to be incorporated for safe drug disposal. Strategies to safe disposal of medication waste can be incorporated to pharmacy curriculum.

Most fundamental role that can be performed by pharmacist is to minimize the amount of pharmaceutical waste and to ensure safe disposal of pharmaceutical waste. Pharmacist can play a major role in regard, by conducting scientific research and surveys, raise awareness among consumers and about the importance of safe disposal of unused and expired pharmaceuticals and encourage policy makers to implement medication retain and disposal program in accordance with existing guidelines and laws. Pharmacist counseling of patients at the dispensing time about safe disposal of pharmaceutical is of paramount importance to strategic promotion and successful implementation of disposal programs. Even though the pharmacist has the key role in safe drug disposal, it is not used in the current situation. During the survey it was known the drugs which have expired and not taken back by the distributors are taken away and burned in open space. Even though they are aware

about the consequences of improper disposal they are doing it today also.

Health authorities need to develop programs as part of pharmaceuticals use analysis in health strategies and community initiatives to promote vigilant culture for undesirable environmental consequences in the developing and underdeveloped countries.

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CONFLICT OF INTEREST:

The authors declare that there is no conflict of interest.

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