

Public awareness about safe drug disposal: a cross-sectional study at karachi, pakistan

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ABSTRACT

Background: Medicine plays a self-centered role in cure, amelioration, and prevention of illness. As the accessibility to medication increased, their significant quantity left unused at home. This study was aimed to assess the practice of storage, reuse, and drug disposal methods among the residents of Karachi. **Materials and Methods:** It was a community-based cross-sectional study, conducted at Karachi during January 2018–February 2018. We included 201 participants of 18–60 years of age. Data were collected by means of Google forms using non-probability convenient sampling techniques. **Results:** A total of 201 people responded, mainly females (87.6%), 18–30 years of age (95%) having no significant medical illness (70.1%) instead 35.3% had leftover medicines at home while 52.2% assumed to have these in next 6 months. Most common unused medicine was analgesic (26.9%) getting disposed by throwing them in trash (87.1%) mainly due to change of prescribed medicine by the doctor (56.2%) which can be avoided by informing the patient's exact quantity of medicine required (53.2%). They recommended there must be special collection points for drug disposal (43.3%). Around 91.5% checked expiry date, 98.5% knew the dangers of self-discontinuation of medication while 78.1% never received information on safe drug disposal so they (99.5%) appreciated to conduct safe drug disposal awareness programs. **Conclusions:** Unused medicine exists almost in every home and in any form. People possess these but they do not know how to dispose these. Therefore, awareness programs about safe drug disposal should be conducted. Guidelines and policies should be introduced and implemented in this regard. Leftover medicines should be channelized to poor and needy with the help of community pharmacy.

Key words: Awareness, cross-sectional study, drug disposal practice in Pakistan, leftover medicine disposal, unused medicine disposal

INTRODUCTION

Medicine plays a self-centered role in cure, amelioration, and prevention of illness. Government regulates three categories of medicine, namely the prescription-only medicine, over the counter medicine, and behind the counter.^[1] As soon as accessibility to medication increased, their significant quantity left unused at home, mostly because of lack of awareness about appropriate methods of safe drug disposal. To handle this issue, people must be evaluated for their knowledge, attitude, and perception about safe drug disposal. Public health and environmental hazards associated with these leftover medicines are also worrisome, especially those associated with accidental poisoning.^[2] Since it is a serious health concern; therefore, these unused medicines should be disposed adequately.

Around 68.9% of medicines were inappropriately prescribed.^[3] Previously a research identified weaknesses in pharmaceutical regulation and system of health care^[4] as a cause of this issue. As far as compliance is concerned, a study showed only 4.1% drug stores were compliant to regulatory requirements^[5] in our city. However, another study showed only 35.8% patients were compliant to the already prescribed medicine.^[6] However, around 26% used to do self-medication with antibiotics revising

the previous prescription by themselves^[6]. These all lead to the presence of unused medicine that needs to be disposed of.

The main purpose of conducting this study was to assess the practice of storage, reuse, and drug disposal methods among the residents of Karachi.

MATERIALS AND METHODS

This was a cross-sectional community-based study. We collected data randomly from the residents of Karachi. We used a structured close-ended questionnaire in English Language by means of Google Forms after taking informed consent. The study was conducted during January 2018–February 2018. The link of the Google Form was circulated by means of social media. In case of any query, they were requested to contact the link provider. (<https://docs.google.com/forms/d/e/1FAIpQLSdv3RAQAEY11-rSIXgKgMNXNGHEJC F178F0ECG4Fleedk1oiQ/viewform>). The sample size was 201. Non-probability convenient sampling technique was employed. We included those responders who were willing to participate after informed consent, having access to Google form, 18–60 years of age, responding during January 2018–February 2018. We excluded those participants who denied to consent, having no access to

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Google form and who were <18 years or more than 60 years of age. Data collected from participants included the demographic data, i.e., their age, gender, marital status, total number of members in the family, education, profession, and recent medical illness. We inquired them for leftover medicine at home recently or expected to have these in the next 6 months. We also asked about the most common unused medicine found in their home, the dosage form which they wanted to dispose off (such as syrup, tablets or capsules, ointment, inhaler, syringes, and injection). We asked them if they checked the date of expiry before purchasing medicines and the method of drug disposal. We interrogated the reason of having unused medicine at home. We took suggestions from them about the best possible way of disposing these medicines as well as minimizing medication wastage meanwhile asking them whether they had awareness about safe drug disposal and about public health and environmental risk associated with inadequate methods of drug disposal. We inquired them of their opinion about public education for safe drug disposal as well as on self-discontinuation of medicine. We entered and analyzed the data using Statistical Package for the Social Sciences for Windows version 16.0.

RESULTS

A total of 201 residents participated of these, 25 (12.4%) were males while 176 (87.6%) were females. Of these, 191 (95.0%) were 18–30 years of age, 6 (3.0%) were 31–40 years of age while 4 (2.0%) were 51–60 years of age. Related to marital status, 178 (88.6%) were single, 2 (1.0%) were engaged, 20 (10%) were married, and 1 (0.5%) was divorced.

Regarding total family members, 1 (0.5%) was living alone, 90 (44.8%) with 1–5 family members, 103 (51.2%) with 6–10 members while 7 (3.5%) had 11–15 family members.

Among them, 1 (0.5%) had secondary education, 28 (13.9%) were educated till intermediate, 161 (80.1%) did bachelor's, and 10 (5.0%) did masters while 1 (0.5%) of them was professor. Of 201, 134 (66.7%) were related to medical profession (including doctors, dentists, pharmacists, physiotherapist, and biotechnologist), 8 (4.0%) were engineers and architect, 36 (17.9%) were students, 6 (3.0%) were teachers, 8 (4.0%) were house wife, 5 (2.5%) were computer experts, 2 (1.0%) were accountant, and 1 (0.5%) were lawyer while 1 (0.5%) managed business.

As far as the medical illness was concerned, 141 (70.1%) of the participant had no illness while the remaining had some diseases [Table 1].

Of 201, 71 (35.3%) recently had leftover medicines at their home whereas 105 (52.2%) anticipated to have these in coming 6 months.

As far as the most common leftover medicine found was concerned, 54 (26.9%) participants told it was analgesic, 44 (21.9%) said it was injections or syringes. It was multivitamins according to 35 (17.4%) of them, antibiotics according to 30 (14.9%) people, antacids or laxatives according to 19 (9.5%), and antipyretics according to 19 (9.5%) of them.

The most common dosage form for disposal was solid oral dosage form (tablets or capsules) according to 63 (31.3%) responders, liquid oral preparations (syrups) according to 48 (23.9%), injections according to 33 (16.4%), topical cream or ointment according to

Table 1: Participant's current medical status

Recent medical illness	Frequency (%)
No medical illness	141 (70.1)
Orthopedic diseases	4 (2.0)
Neurological diseases	11 (5.5)
Cardiovascular diseases and hypertension	5 (2.5)
Respiratory diseases	19 (9.5)
Gastrointestinal diseases	2 (1.0)
Dermatological diseases	4 (2.0)
Joint diseases	3 (1.5)
Gynecological diseases	3 (1.5)
Endocrine diseases and diabetes	5 (1.5)
Renal diseases	1 (0.5)
Psychiatric diseases	2 (1.0)
Autoimmune diseases	1 (0.5)

20 (10.0%), syringes, ear or eye drops and inhalers according to 18 (9.0%), 17 (8.5%), and 2 (1.0%) participants, respectively.

175 (87.1%) of them disposed drugs by throwing them in trash whereas, 9 (4.5%) flushed down the sink or toilet, 7 (3.5%) shared them with their relatives or friends, and 6 (3.0%) people donated unused medicines to those who cannot afford purchasing it while 4 (2.0%) buried them in the ground by digging a hole.

The most common reason to have leftover medicine was the change of medicine by the treating physician according to 113 (56.2%) participants. However, the remaining responders had different opinions for having leftover medicines. 57 responders (28.4%) considered self-discontinuation to be the main cause. According to 26 (12.9%) of participants, the reason for excess medicine was to use them for first aid, as if the need arises in case of emergency. However, 5 (2.5%) of them assumed purchasing medicine due to advertisement, was the cause.

The best possible way to minimize leftover medicines was also asked [Figure 1]. They also gave suggestion regarding safest method for drug disposal [Figure 2].

Out of these 201 responders, 185 (91.5%) used to check expiry date before purchasing medicine. Still, the remaining 17 (8.5%) did not check the expiry date before making a purchase.

Almost 161 (80.1%) were aware about the public health and environmental hazards associated with the presence of unused expired or unexpired medicine at home. But 40 (19.9%) people were unaware of the serious issues of public health and environmental hazards attributed by these leftover medicines. 198 (98.5%) knew the dangers of self-discontinuation of medication. Still, 3 (1.5%) of them had no awareness about this issue.

Only 44 (21.9%) received information about safe method for drug disposal while the majority of 157 (78.1%) remained uninformed. Almost all of them (200 = 99.5%) appreciated the idea to conduct awareness programs for safe drug disposal.

DISCUSSION

Our responders were mostly females (87.6%), 18–30 years of age (95%), single (88.6%), living with 6–10 family members (51.2%),

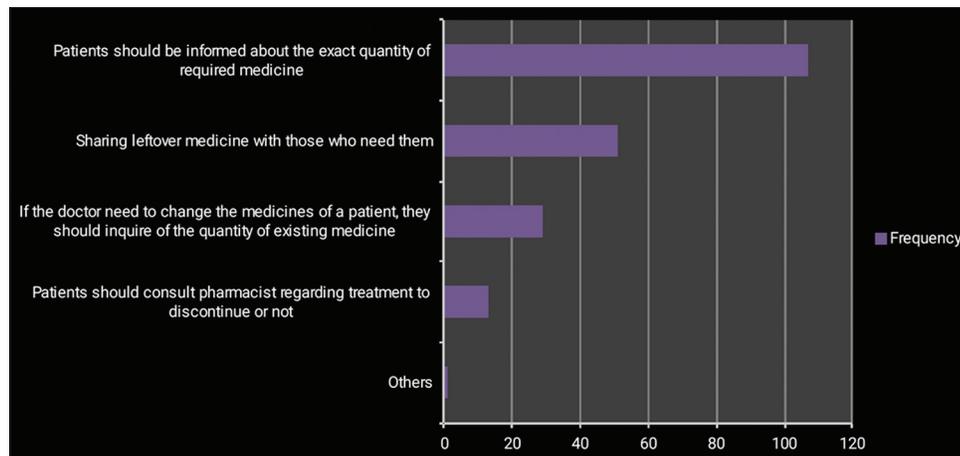


Figure 1: Participant's opinion about best possible way to minimize leftover medicine

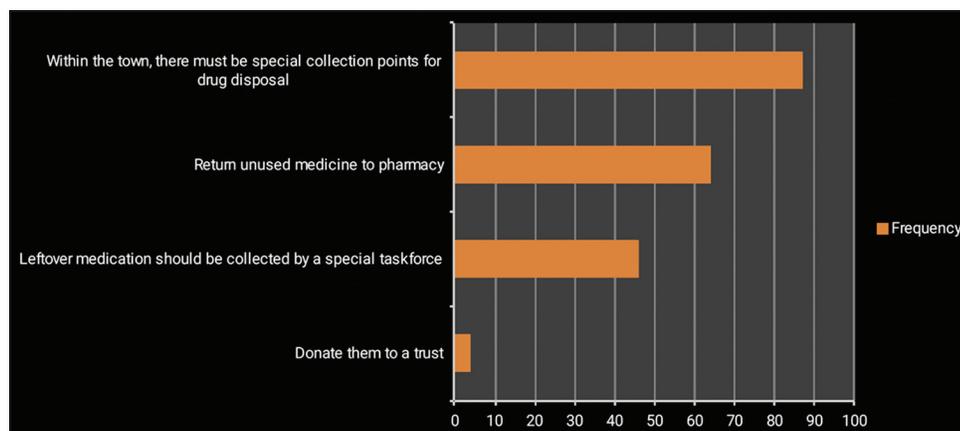


Figure 2: Responder's suggestion about best possible method for safe drug disposal

and graduates (80.1%) while 66.7% were related to medical profession (doctors, pharmacist, medical technologist, etc.). Majority of them had no significant medical illness (70.1%) despite 35.3% of them had leftover medicines at home. However, a Turkish study depicted 28.0% of the participants had leftover medicine.^[7]

Most frequent unused medicine found at home was analgesic according to 26.9% of the responders of our study; while, an Iranian study presented antibiotics were most commonly unused medicine (46.5%).^[8] Most common dosage form they wanted to dispose of was solid oral preparations (31.3%) since it was least expensive, safest, most convenient and preferable route. This was contrary to a study which showed most common dosage form was liquid.^[1]

Majority (91.5%) of the participants used to check the expiry date before making purchase which is a good practice whereas, in Iran, a study showed 97% people checked the expiry date before purchasing them.^[8]

Medicines were mainly disposed by throwing them in trash or a waste bin according to 87.1% responders. This was consistent with a study at Saudi Arabia.^[9] Another study also depicted throwing them in the garbage was the most common practice in many countries.^[10]

The reason for having leftover medicine was the change of already prescribed medicine by the doctor (56.2%) also

manifested by study in West Bengal.^[11] Another study in Ireland showed that the perception to reuse the same medicine, later on, was the most common reason according to 68% of the participants, for having these leftovers.^[12] The best possible way to avoid excess medication was to inform the patients the exact quantity of medicine required according to 53.2% participants in our study.

Almost 52.2% of them expected to have unused medicines in the next 6 months. While according to an American study, this figure reduced to 32%.^[13]

Since public health and environmental hazards are life threatening with unsafe disposal; therefore, the majority of them agreed that within the town, there must be special collection points for drug disposal (43.3%), was the best possible way for safe disposal. Instead, another study at India preferred collection by special task force.^[14]

Majority of them (98.5%) agreed that people should be educated about dangers of self-discontinuation of medicine. They (99.5%) also appreciated the idea about conducting safe drug disposal awareness programs. Whereas in Saudi Arabia 78.6% appreciated the idea of public awareness about safe drug disposal.^[15] Studies also emphasized on public education related to this issue^[16] would ultimately promote behavioral change.^[17] Therefore, awareness

programs must be conducted, public must be encouraged regarding behavioral modification, and recent guidelines and new policies should be introduced and implemented in this regard.^[18-20]

The limitation of our study was the use of self-administered questionnaire. Hence, we could not exclude the information bias. It might be a significant hindrance in evaluating a meaningful relationship and a trend.

We recommend people must be guided to dispose medicine in waste bin after scratching all the information of drug, placing it in sealed bags or mixing it with substances so that no longer they remain identifiable. While those medicines that can cause poisoning should be flushed off. However, they later on lead to the contamination of water bodies. Medicines should not be buried since they can adversely affect plants and crawling species over there.

There should be special collection points for leftover medicine. Annual drug dumping campaigns should be organized. Public should be educated by means of leaflets, advertisements, talk shows on media, especially the social media being more popular these days. New policies and guidelines must be introduced and implemented.

CONCLUSIONS

Unused medicine exists almost in every home and any form. People possess these, but they do not know how to dispose these. Considering this issue, awareness programs about safe drug disposal should be conducted to minimize public health and environmental hazards associated with the presence of unused expired or unexpired medicine at home. Guidelines must be introduced, and policies should be implemented in this regard. Leftover medicines should be channelized to poor and needy with the help of community pharmacy.

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