

Safe Disposal of Medicines in Palestine

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Abstract: The disposal of unwanted and expired medications has been a concern to public health practitioners, and patients alike. The objective of the current investigation was to look closely at the practice of patients and cares in Nablus-Palestine with regard to disposal of unused or expired medicines. The study was a cross-sectional survey administered via face-to-face structured interviews with randomly selected patients, community pharmacists and physicians from Nablus-Palestine. Two hundred and fifty patients/cares completed a questionnaire regarding medicines disposal current practice, effects on environment, and their views to overcome this problem. Most of the people completing the questionnaire (67%) stated that they throw unwanted medicines in the normal household bins, and about 75% think that this can impose illegal and environmental hazards. Nearly half of the questionnaire showed that main reason for need to dispose medicines was possessing expired ones with almost believe there should be more appropriate way to dispose medicines. About 95% said they have not been directed for safe disposal of medicines with 46% thinking that a national campaign can be very educative in this issue mainly through Ministry of Health (54%) followed by .73% of the sampled patients were in favor of national campaign to direct people to safe disposal of medicines. This pilot study in Nablus clearly highlights the need for appropriate method for safe disposal of medicines in Palestine through guidelines in pharmacies and hospitals. A well organized method for collecting unwanted medicines from people should be encouraged through appropriate teaching of patients and carers about effects of waste medicines on environment as well as being domestic hazard. The data and information is valuable for furthering discussions regarding patients behaviour and also provides a basis for future research into determining what quantities of active pharmaceutical ingredients (APIs) are disposed, enter the environment and what effects it can impose.

Key Words: Active pharmaceutical ingredients, medicines disposal, medicine use.

1. Introduction

Pharmaceuticals are designed to help humans, animals to overcome diseases or prevent them, but many times leftovers in form of unused medicines in houses cabinets or expired medicines in pharmacies, hospitals and residential places impose a serious hazard on people themselves and environment.

Pharmaceuticals have been detected throughout the environment where at least in some cases; they have been shown to have a detrimental effect. Many effects result from improper patient disposal of unused pharmaceuticals via environmentally-unfriendly routes [1]. Starting in the mid 1960s, ecologists and toxicologists began to express concern about the potential adverse effects of pharmaceuticals in the water supply, but it wasn't until a decade later that the presence of pharmaceuticals in water was well

documented. Studies in 1975 and 1977 found clofibrate and salicylic acids at trace concentrations in treated water [2].

These pharmaceuticals in form of medicines may represent or place risk on humans, wildlife and environment. In fact whether people are using medicines or disposing them, it all ends up in environment [3] Fig. 1.

APIs (active pharmaceutical ingredients) entry to our environment is quite a complex issue, a long standing assumption has been that APIs enter the environment as trace contaminants, primarily as a result of unwanted leftover medications by flushing into sewers has been considered a minor secondary route as one that does not contribute substantially to overall environment loading [4]). A study on "Drug Disposal and Stewardship Ramifications for the Environment and Human Health" was carried at university of Nevada. This project data revealed some

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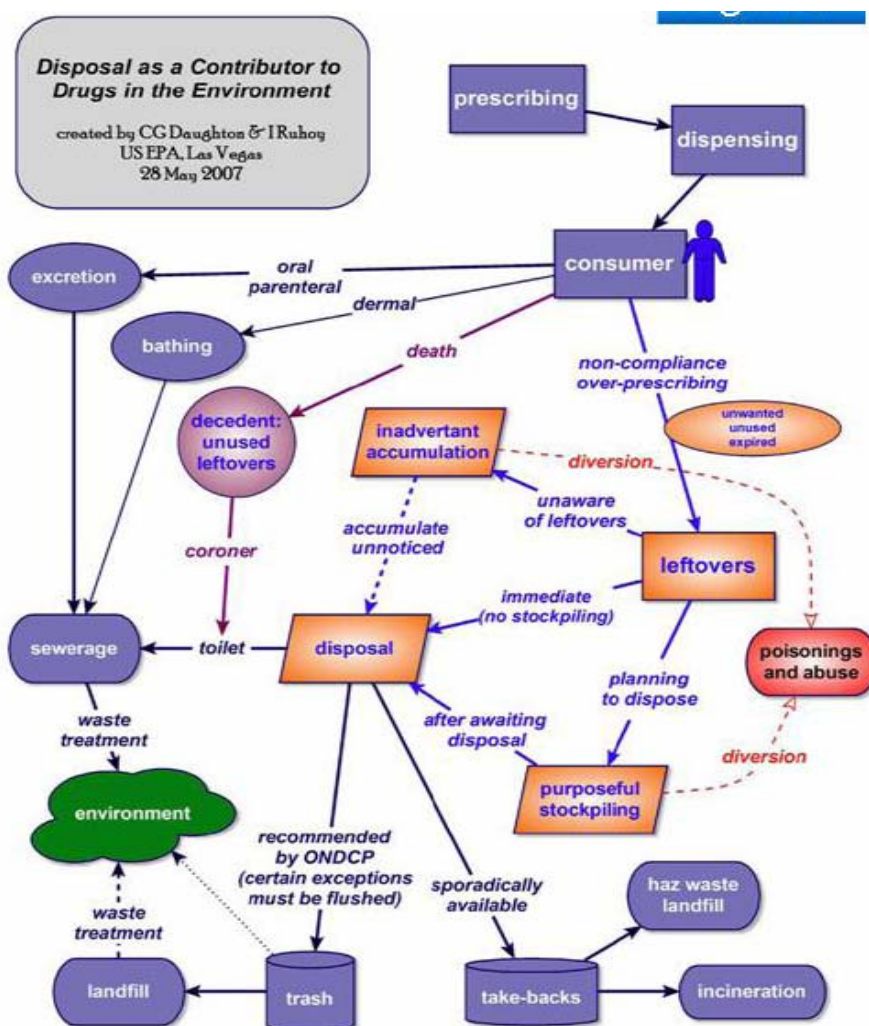


Fig. 1 Disposal as a Contributor to Drugs in the Environment.

under-appreciated hazards associated with handling of medications recommended by FDA for preparing unwanted leftovers for disposal. Drug residues (from both human and veterinary use) touch the environment in many ways, they can contaminate surface and ground waters (via discharge of treated and raw sewage and disposal of leftover drugs and medicated feeds) arable soils and crops [5]. Despite the thousands of publications over last two decades on various aspects of pharmaceuticals as environmental pollutants, it has only been recently proposed that actions to reduce environmental impact of pharmaceuticals also can have reciprocal, collateral, positive outcomes for human health [6].

People keep dumping those old tablets in the toilet; this might kill helpful bacteria that live within the septic system. The drugs can trickle into ground water and they may end up in the domestic supply or the normal lives in ground. The disposal of prescription drugs has to be done professionally and within the guidelines that are set by the health authorities

The increasing use of an ever-growing array of chemicals for diagnostic, preventive, and therapeutic use in health care inevitably results in the introduction of pharmaceutical residues into the environment. The significance of drug disposal as a source of API (active pharmaceutical ingredients) in the environment is largely unknown and cannot easily be separated from

their entry through other means. The prudent disposal of unwanted medications, however, is one of the easiest ways patients can directly impact the environmental presence of APIs [4].

2. Materials and Methods

The study was carried out at several primary and secondary care institutions as well as local community pharmacies Nablus which is the largest city located in the north of Palestine. It was conducted over one month period (April 2011). Researchers distributed a survey to patients and pharmacists.

Statistical analysis was done using Statistical Package for Social Sciences (SPSS) version16.

3. Results

Two hundred and fifty patients completed the questionnaire. Almost all of respondents were under 30 years old with (57.6%) males. They had first university degree (34.8%). Many respondents (68.6%) thought that using expired medicines cause harm to human body. The respondents gave reasons why they would need to dispose of medicines in the home. These ranged from possessing expired medicines

(51.2%), having an excess of medication in the home (23.6%) change or discontinuation of medication by the doctor (10.4%) and self-discontinuation of the medicine (7.2%).

The most common method of disposal of unwanted medicines was throwing them in the household dustbin (66.4%) or returning them to a pharmacy (13.6%), Other methods of disposal, flush them down the toilet or sink were cited by (10.8%) of the respondents.

Almost all respondents (94.8%) did not see any advert in community pharmacy, hospital or medical centre offering to take back unused medication for disposal and (78%) of the respondents never returned unused/expired medicine to pharmacies. (74.4%) of respondents thought that unsafe disposal of medicine can lead to illegal drug trade, also can lead to children poisoning and cause environmental pollution.

In response to what their opinion was on responsibility for unsafe disposal medicines, 53.2% thought that MOH (ministry of health) is a major responsible for unsafe disposal medicines, while 30% thought that patients are responsible while 6.8% thought that pharmacists are responsible (Fig. 2).

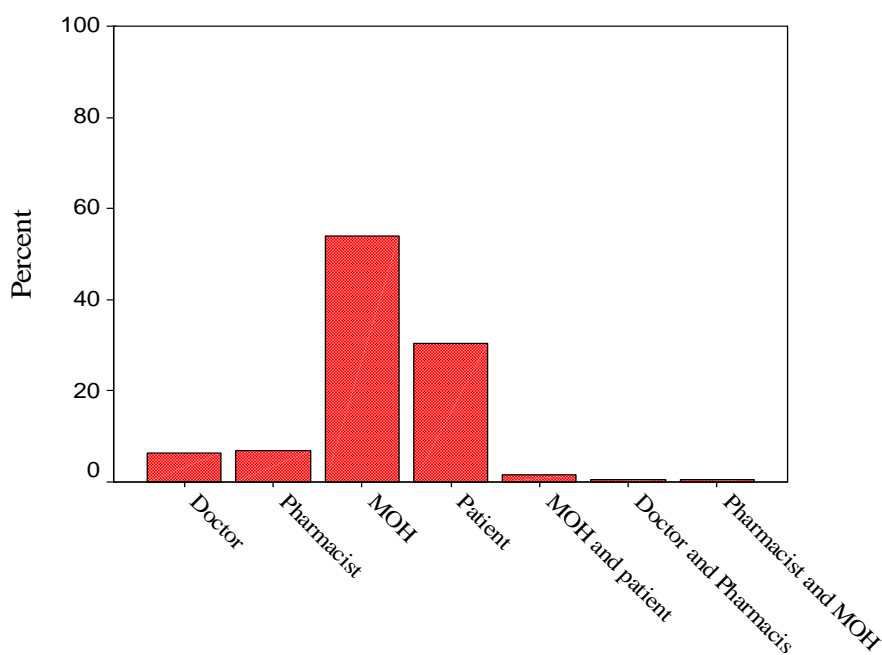


Fig. 2 The responsibility for unsafe disposal of medicines by patients.

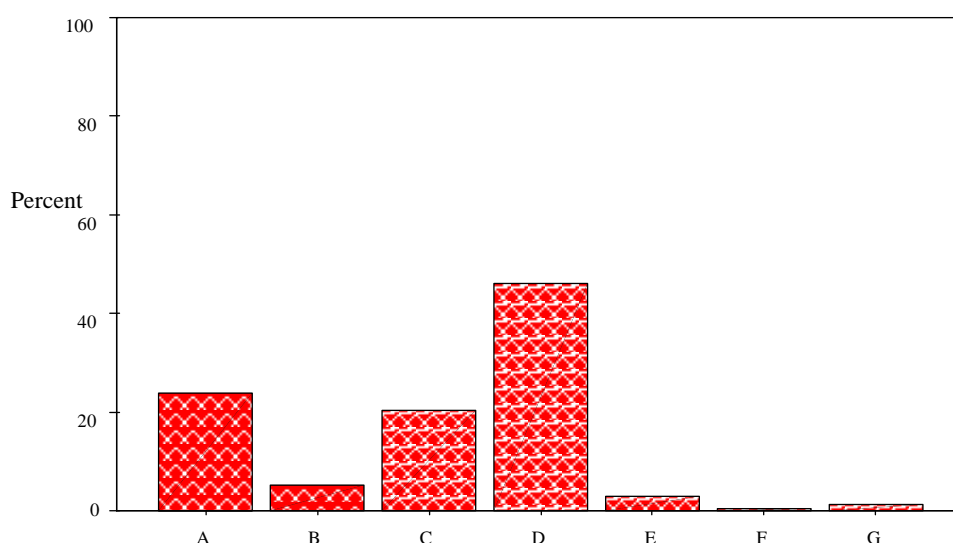


Fig. 3 The best approach for patient education.

A: Through media like T.V, B: Booklets and publications, C: Pharmacy lead Advice, D: National Campaigns, E: Through media like TV and Booklets and publications and Phar, F: Through media like TV and Pharmacy lead advice, G: Pharmacy lead advice and National campaigns

In response to what their opinion was on the best approach for patient education ($n = 250$ valid responses), 45.6% thought that national campaigns would be appropriate, 23.6% thought there should be special programs introduced through media like T.V, Radio, while 20% thought pharmacists should educate patients on safe disposal of medications and 5.2% thought that distributing booklets and publications to educate the public on this topic (Fig. 3).

Respondents were also asked to select ways of decreasing the amount of wasted medication. Most (73.6%) thought that the public needed education on this topic, While 20.4% felt the patient should be given the exact amount of medication required.

4. Discussion

This study looked at the practice of people in city of Nablus in disposing their unused/expired medicines. This study showed that the majority of the participants (66.4%) threw the unused medication into the trash while (78 %) of participants never returned unused/expired medicines to pharmacies. Similar finding

reported by Malaysia , (57.1%) threw the unused medication into the trash [9]. A study conducted by Statistics Canada (2005) [10] reported that about a quarter of Canadian households generated leftover medications. Of the households with unused medications, the portion that continued to practice disposal via the sewer, trash, or burial was significant. Ranging from 20-70% study from Kuwait showed that three quarters of respondents reported that they discarded unwanted medicines in the trash [11].

In this study, the main reasons that require disposal of medicines in the home were expired medicine (51.2%) and patients had excess medications in the home (23.6%). In other hand, (74.4%) of respondents thought that unsafe disposal of medicine can lead to illegal drug trade, also can lead to children poisoning and cause environmental pollution.

In this study, the majority of the participants (45.6%) mentioned that the best way to educate the public about disposal unused medication was through national campaigns (schools, universities and special programs introduced through media like T.V, Radio).

Similar study carried out in Kuwait, reported that involvement of the Pharmaceutical Associations would be essential and public education through the mass media [12]. Providers and pharmacy personnel could discuss medication disposal with patients, and written education could be distributed with medications in a manner similar to what was described above. Or, innovative solutions, such as placing disposal information on medication labels or pill bottles, might prove effective [13]. Future research should focus on how to most effectively educate patients on proper disposal techniques.

Where no organised collection system exists, disposal of medicines in domestic garbage destined for land fill is more environmentally friendly than flushing them down the drains [7, 8], but this should not give complacency since disposal in domestic trash is still only a measure of last resort [8].

In Palestine MoH (ministry of health) offers free collection of unused/expired medicines from community pharmacies as well as hospital pharmacies, but most of pharmacy managers we spoke to as well as our survey results showed that most of these unused medicines end up in domestic dust bins or flushed in toilets.

5. Conclusions

This pilot study in Nablus clearly highlights the need for appropriate method for safe disposal of medicines in Palestine through guidelines in pharmacies and hospitals. A well organized method for collecting unwanted medicines from people should be encouraged through appropriate teaching of patients and carers about effects of waste medicines on environment as well as being domestic hazard.

The data and information is valuable for furthering discussions regarding patients behaviour and also provides a basis for future research into determining what quantities of APIs (active pharmaceutical ingredients) are disposed; enter the environment and what effects it can impose.

People should not undertake medication recycling because it is forbidden under the FDA regulations. Instead they should drop off unwanted medications in the collection points at pharmacies and hospitals. Donating drugs to the needy is risky unless it is supervised by pharmacist/doctor team [14].

Despite the efforts of MoH like offering free collection from pharmacies, coordinated efforts in association between MoH and PPA (Palestinian Pharmacists' association) and more structured regulations by MoH and environmental agencies to enforce safe disposal of medicines in particular and medical waste in general.

More rigorous monitoring for implementation of such measures by MoH inspectors is also needed. In parallel there is need for constructing treatment facilities for disposed medicines and medical waste.

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