

Unused and expired medications disposal practices in the community: a cross-sectional survey in Cheras, Malaysia

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Irresponsible disposal of unused and expired medications may lead to both environmental and public health hazards and has been subject of several studies [1-3]. The presence of pharmaceuticals and their respective metabolites in the aquatic environment has become a source for rising concern in recent years and several studies [2,3] have shown that the existence of these substances in waste water and drinking water [4] and they may be potentially harmful to aquatic life. Besides, risk to human life remained a concern [2]. Therefore, the objective of this study was to assess medication disposal practices and environmental risks awareness of improper disposal of medications among individuals in the community. A 9-item structured questionnaire was developed based on existing literature [1-3]. Following a pre-test on ten people in a community shopping mall, the final questionnaire was administered face-to-face to a convenience sample of 200 participants at different areas in two large shopping malls and surrounding restaurants in Cheras, Kuala Lumpur, Malaysia. Findings demonstrate that Majority of participants (51.5%) were male. In terms of ethnic distribution, the majority of participants surveyed were Chinese (66.5%), followed by Malays (17.0%) and Indians (15.5%). Majority of participants (47.5%) were aged between 20-29 years old.

Medication disposal practices among participants in the community

The most frequently used method to dispose unused or expired medications are throwing into the rubbish bin (60.6%)

Key words

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These finding supports an earlier study among patients in Malaysia [5] and studies in other communities [2]. While disposal of medications into the trash may not pose an immediate adverse impact on the environment, it could have delayed environmental hazards as they may be ultimately released into the environment as leachates[2]. Besides, medications left in the trash increases the potential for accidental exposures and accessibility to children and animals [3]. Although certain pharmaceuticals may be disposed in the thrash, the public may still not be aware of the proper way to discard the drugs via this approach. Among the respondents, 16.2% return unused medications to the pharmacy/healthcare provider, while 9.7% store the medicines at home. Other methods include flushing down the toilet (7.3%), giving the medications away to family and/or friends (3.5%) and the method least used was rinsing down the sink (2.7%).

Awareness of the proper methods of drug disposal Majority of participants (86%) in our survey are not aware of the proper methods for disposal of unused and/or expired medications. The results also revealed that the awareness on the proper mode of drug disposal significantly correlates with the participant's occupational background (Pearson's $\chi^2=13.5$, $p=0.004$).

Source of information on the proper method of drug disposal

The results showed that healthcare providers (39.3%) were the foremost source of information on proper methods for drug disposal among the 28 respondents who claimed awareness of proper disposal methods. Other sources include friends and family (25%), internet (21.4%) and medical literature (21.4%).

Awareness of environment risks by inappropriate disposal of unused and/or expired medications

Majority of respondents (60%) of the survey indicated that they are aware of the environmental dangers posed by improper disposal of pharmaceuticals.

The findings of this study showed that throwing unused and expired drugs into the rubbish bin as the most commonly used method of disposal in the community. Additionally our study revealed that the public is still not well informed on the issue of proper disposal of unused and expired drugs. Majority are however aware of the

environmental risks of improper disposal of medications. While perceived awareness of risk to the environment could inform a chosen disposal method by consumers, it has however been noted that the link between risk perception and behaviour is a complex one [6]. Educating both the public and health care providers regarding unused medication is critical in instilling awareness on the safe disposal methods of unused and expired medications. Disseminating sufficient information pertaining to irresponsible drug disposal methods and the risks that accompanies it is also crucial to highlight the magnitude of the problem. In addition, the formulation of a national guideline on the appropriate disposal of unwanted medications is recommended.

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