Tropical Journal of Pharmaceutical Research May 2016; 15 (5): 989-993
ISSN: 1596-5996 (print); 1596-9827 (electronic)

Available online at http://www.tjpr.org
http://dx.doi.org/10.4314/tjpr.v15i5.13

Original Research Article

Assessment of the storage and disposal of medicines in some homes in Jos north local government area of Plateau State, Nigeria

Samuel B Banwat*, Asa Auta, Danlami W Dayom and Zakni Buba
Department of Clinical Pharmacy, Faculty of Pharmaceutical Sciences, University of Jos, Nigeria

For correspondence:* ***Email:* *samuelbanwat@yahoo.com Tel: +2348035865698*

Received: 15 April 2014 *Revised accepted: 6 April 2016*

Abstract

Purpose: *The purpose of this study was to assess the way medicines are stored and disposed in some households in Jos North Local Government Area (LGA) of Plateau State, Nigeria.*
Methods: *A cross-sectional survey of 130 households in Jos was carried out using a questionnaire to ascertain practices associated with medicine storage and their disposal.*
Results: *The results showed that 105 (80.8%) households had 635 medicines in their homes, 65.8% of which were unused medicines (3.2 unused medicines per household). Some households stored their medicines in bags/containers (76.2%) while others kept them in cup-boards/cabinets (21.96%), refrigerators (10.5%) or other places (3.3%). Methods for disposal of unused drugs varied among households with some disposing them in trash cans (70.5%) while other disposed them in toilets (19.0%) or burnt them (10.5%). Only 10.5% (n=11) of respondents knew how medicines were properly disposed.*
Conclusion: *While most households store their medicines appropriately, majority of them adopt poor disposal methods for medicines they no longer need in their homes. Public health education on problem disposal of medicines is of the essence.*

Keywords: *Jos North Households, Medicines, Storage, Disposal.*

Tropical Journal of Pharmaceutical Research is indexed by Science Citation Index (SciSearch), Scopus, International Pharmaceutical Abstract, Chemical Abstracts, Embase, Index Copernicus, EBSCO, African Index Medicus, JournalSeek, Journal Citation Reports/Science Edition, Directory of Open Access Journals (DOAJ), African Journal Online, Bioline International, Open-J-Gate and Pharmacy Abstracts

INTRODUCTION

Improper handling, storage or disposal of medicines can lead to drug abuse, accidental poisonings and environmental pollution. In addition, the storage of unused medications in households may have an adverse economic impact on household members in countries where payment for healthcare are made out of pocket [1]. Factors such as poor adherence, discontinuation of medication, adverse effects and dose changes have led to accumulation of unused or expired medicines in some households [2]. Medicine wastage explicitly pertains to partially or totally unused medicines as well as expired medicines [3].

Appropriate storage of medications, including vitamins and vitamin supplements, in homes is essential for their proper use and safety. Keeping medications stored properly will also keep them in the physical conditions for optimum efficacy [4].

Nowadays, the disposal of unwanted medicines from households is becoming an increasing problem for local and national health and environmental authorities due to the direct risks associated with unsafe disposal [5]. The primary entry pathway of pharmaceuticals into the environment is the use and disposal of medicines [6]. These pharmaceuticals have been reported to accumulate in the soil, ground water and drinking water [7]. For instance, in order to ensure safe disposal of inhalers containing chlorofloro carbons, the FDA instructs that local trash and recycling facilities should be contacted for direction on the proper steps to take [8].

As storage and disposal of unused medicines vary in different settings, there is the need for evaluation of practices within diverse areas. The objective of the study was therefore to assess the storage and disposal practices of medicines in some homes within Jos North Local Government Area of Plateau State in Nigeria.

METHODS

Study setting

This study was conducted in Jos North Local Government Area of Plateau State which is located in the middle part of Nigeria. The areas covered in the study are urban communities inhabited by people from different cultural, religious, educational and social backgrounds.

Study design

This study was a cross-sectional survey conducted among 130 households. It consisted of a convenience sample of members of the communities and neighbours; some of these were church members living in the communities.

Study Instrument

The study instrument was a structured questionnaire, made up of both open and closed ended questions, designed to collect demographic information as well as information on storage and disposal of medicines. It had two sections; the first section was designed to collect demographic and personal data information while the second section contained questions to determine the attitude and knowledge of respondents to medicines. Thus, in the first section, participants were asked to provide information regarding their gender, age, academic background of heads of households, occupations of head of households, members of families in charge of keeping medicines, number of people living in each house and whether members were covered by health insurance scheme or not. In the second section, respondents asked questions relating to their opinion and perceived value on storage and disposal of medicines. It also had a place for recording different types of medicines kept at home. In this section, information regarding names of medicines (brand and generic), dosage forms, strengths, expiry dates, quantities left (if medicines were left over), places of purchase, if medicines were gotten on prescription or self-medication, as well as places of storage and disposal were included.

The questionnaire was pre-tested in ten households for a period of five days and adjusted to meet the stated objectives.

Data collection

A visit was made to each participating household. During the visit, the aim and scope of the research was explained to the household members and their informed verbal consent was sought. Household members were told that information collected would be confidential. They were then interviewed for information on storage and disposal of medicines and factors that influenced their choice of storage and disposal. This was guided by the questionnaire and the drugs found in such households were recorded.

Data analysis

Data collected from this questionnaire were entered into the statistical package for social sciences (SPSS) version 16.0 to generate descriptive statistics.

RESULTS

A total of 130 households were visited and only 105 (80.8%) of these households had medicines in their homes. The mean age of household representatives interviewed was 33.01 ± 11.80 years. These respondents consisted of 27.7% (36) males and 72.3% (94) females and the average number of persons per household was 6 ± 3.

The 34 (32.4%) households with medicines in their homes had a family member in charge of keeping the medicines. In 94.1% (32) of these households, the mother carried out this responsibility while in 5.9% of the cases, the father was in-charge. Of the household visited, 17.7% (23) reported that they had a form of insurance coverage.

Six hundred and 635 medicine items were found in the households surveyed. Some of the medicine items (217, 34.2%) were in use as at the time of study while the rest (418, 65.8%) were left over medicines representing an average of 3.2 unused medicines per household. Analgesics (22.8%) constituted the commonest class of drugs and was closely followed by antibiotics (19.2%) (Table 1). Tablets (63%) were the commonest dosage form of the medicines found in households (Table 2).

Table 1: Classes of medicines found in households

Class of medicine	Frequency	%
Analgesics	145	22.8
Antibiotics	122	19.2
Antimalarials	48	7.6
Antiplatelets	7	1.1
Antihypertensives	15	2.4
Antidiabetics	11	1.7
Antispasmodics	16	2.5
Antiulcers	42	6.6
Antihistamines	49	7.7
Antihelminthics	3	0.5
Antidiarrheals	39	6.1
Eye preparation	11	1.7
Nutrition/blood product	72	11.3
Others	55	8.7

N = 635

The study showed that 62.7% (398) of medicine items found in households were obtained through self-medication. Most of such households, (92.4 %, 97) reported that they had the intention of re-using the medicines. Furthermore, most households got most of their medicines from pharmacy shops (83.8%) while others got them from hospitals (41.3%) or patent medicine shops (33.3%). Of all the medicines found in households, 0.03% (16) were unlabelled, while 0.07% (42) was found to have expired and only 0.07% were in their original packs. Various reasons were given for keeping medicines in their homes (Table 3).

Table 2: Dosage forms of medicines found in households

Dosage form	Frequency	Percentage
Tablets	406	63.9
Capsules	108	17.0
Injections	7	1.1
Suspensions/Syrups	97	15.2
Creams/Ointments	17	2.8

N=635

Table 3: Why respondents had medicines in their households

Reason	Frequency	Households (%)
Emergencies	29	27.6
They are regular medicines	33	31.4
They are leftover medicine	63	60.0
Keeping them in case of similar illness	40	38.1
Other reasons	26	24.8

N=105; NB. Some households gave more than one reason for keeping medicines in their homes.

The medicines were often stored in bags/container (76.2%), cupboard/cabinet (21.9%), refrigerator (10.5%) or other places (3.8%). Sources of information on drug storage indicated included medicine labels (53%), medicine leaflets (5.7%) and medical staff (1%). For respondents in households with medicines, the sources reported were the media (52%), books (2.9%), internet (18.1%) and health staff (24.8%). As many as 40% of the participants used their discretion in disposing off medicine. Some respondents (70.5%) indicated that they disposed off their unwanted medicines in trash cans (70.5%), toilet (19.0%) or by burning (10.5%) (Table 4). Only 10.5% (11) of respondents were aware of how medicines should be properly disposed.

DISCUSSION

The study showed that most households (65.8%) had unused medicines in the home for various reasons. Most of these medicines were stored in bags/containers (76%), cupboards/cabinets (21.96%) and refrigerators (10.5%). Some of the

medicines were dispensed without appropriate labeling and disposal by the majority was done inappropriately as such unused medicines were disposed into trash cans.

Table 4: Where respondents dispose their medicine

Site of disposal	Frequency	Percentage of respondent
Trash can	74	70.5
Sink	1	1.0
Toilet	20	19.0
Burn it	11	10.5
Others	27	25.7

N = 105; More than one method of disposal was indicated by some households.

Improper handling and storage of medicines can lead to consumption of less potent drugs, drug abuse, accidental poisoning or drug wastage [9,10]. From the results obtained, it is evident that most of the households were aware of the need to keep medicines away from unauthorized and vulnerable persons in the home and also to keep them in such a way that they do not compromise their integrity through degradation. It is heart-warming to know that most households had a member responsible for keeping the medicines and 90% gave that role to the mothers in the homes. Although the percentages of medicines that were unlabelled, or expired or not in their original pack were low, taking such medicines could be a potential health risk. When medicines are stored outside their original packages, individuals may not be able to benefit from the vital medicine information contained in the medicine leaflets or packages and this can result in inappropriate handling and use of medicines. It can also lead to the administration of expired medicines.

It does appear that those who dispensed the medicines to those who participated in the study did not often provide proper information on storage and disposal of medicines; this is not surprising because of the many unauthorised sources of medicines in Nigeria. However, some pharmacists often provide relevant education on how medicines should be stored. Improper disposal of medicines b even pharmacists have been reported in Kuwait where as many as 73% of 144 pharmacists interviewed admitted to disposing of unwanted medication in trash cans [11]. Unused medicines improperly disposed can create environmental hazard [12]. The problem of improper disposal may be addressed through a ‘‘medicine-take-back-programme for disposal” in which community members would be encouraged to return expired, unwanted or unused medicines to the pharmacy or hospitals that can arrange for approved agencies to collect and dispose of them appropriately [5]. Of major concern is the high proportion of left-over medicines (65.8%) which calls for urgent intervention.

Since analgesics are over-the-counter medicines that households buy to relieve pain and also the first line medicines used by community members in the event of an illness, it was not surprising that they were the most common class of medicines that were stored in the home. However, their irrational use can lead to adverse effects. For example, they can contribute to increased risk of liver and kidney damage when taken at high doses [12,13]. However, the high amount of antibiotics found in households is an indication of inappropriate use of antibiotics and may be contributing to bacterial resistance in most of the communities.

The interpretation of this study could be limited by under-reporting improper identification of medicines that may have been classified appropriately.

CONCLUSION

The study revealed that most households stored medicines in bags, cupboards and other places. The disposal of medicines which they no longer needed was done in the manner they disposed of other household items without regard to the possible danger in the environment. These practices in homes can be improved upon through public health education and enlightenment.

CONFLICT OF INTEREST

No conflict of interest associated with this work.

CONTRIBUTION OF AUTHORS

We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

REFERENCES

1. *Auta A, Omale S, Shalkur D, Abiodun AH. Unused Medicines in Nigerian households: Types and disposal practices; J Pharmacol Pharmacother 2011; 2: 195-196.*
2. *Caroline A, Margaret G, Rebecca G, Ashleigh H, Tim H, Tom K, David S, Suzie T. Disposal of unwanted*

medicines through Pharmacies. Nelson Bays Primary Health Boards, 2010 [cited 2013 April 30] Available:static. bewell.org.nz/gems/DUMPFinalReport.pdf

3. *Ali SE, Ibrahim MI, Palain S. Medication storage and self medication behaviour among female students in Malaysia. Pharm Pract 2010; 8: 226-232.*
4. *Andy and Handymen. Tips on Safe Medication Storage and Disposal, 2009; www.safeguard mymeds.org*
5. *Abahussain E A, Ball DE, and Matowe WC. Practice and opinion towards disposal of unused medications in Kuwait; Med Princ Pract 2006; 15: 352-357.*
6. *Bound J, Vouluolis N. Household disposal of pharmaceuticals as a pathway for aquatic contamination in the United Kingdom. Environ Health Perspect 2005; 113(12): 1705-1711.*
7. *Tong AY, Peake BM, Braund R. Disposal Practices for Unused Medications around the World. Environ Int 2011; 37: 292-298.*
8. *FDA. Consumer Updates How to dispose unused medicines. 2011 Available from http://www.fda.gov../ucm101653.htm Accessed 23 August 2013.*
9. *WHO. New initiative launched to better supply life-saving medicines in crisis countries, 2009. http://www.who.int/hac/techguidance/27october2009/en/. Accessed 24 October 2015*
10. *Ruhoy IS and Daughton CG. Beyond the Medicine Cabinet: An Analysis of where and why medications accumulate. Environ Inter 2008; I34: 1157-1169.*
11. *Abahussain E, Waheed M, Kosh S. Practice Awareness and Opinion of Pharmacists toward disposal of unwanted medication in Kuwait. Saudi Pharm J 2012; 20(3): 195-201*
12. *Liden KA. Medicines in Pharmacy Students' Residence and Self Medication. J Young Pharm 2005; 2: 6-13.*
13. *Braund R, Gn G and Mathews R. Investigating Unused Medications in New Zealand; Pharm World Sci 2009; 31: 664-669.*