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Storage and Cost of Medicine in Libyan Homes

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Abstract

Background: The way we store our medications affects their effectiveness. When patients need to take their prescriptions outside the home, the health care provider should advise them on how to transport and store them safely.

Objective: This study aimed to investigate or determine the storage conditions of medicines, usage habits, and cost of medications in households in Libya.

Methods: This cross-sectional study included questionnaires conducted randomly in 100 Libyan homes. Householders were informed in advance of the survey, which took place from September to November 2023.

Results: the final questionnaire included the following sections: there was demographic data on household storage of medicines in Libya, types of medications found in Libyan households, places for drugs were stored in Libyan households, factors related to medications in Libyan households, and cost of drugs found in Libyan households.

Conclusion: the prevalence of household drug storage in 100-libya households was analgesics, antihypertension, and antiasthmatic. Most drugs kept at home were not appropriately labeled or stored in a safe place. This study highlights the urgent need for improved awareness and education regarding proper medication storage and labeling in Libyan households.

Keywords: Anti-Asthmatic Agents, Drug Storage, Libya, Prevalence, Surveys and Questionnaires, Health Personnel.

INTRODUCTION

In most households worldwide, medications are kept on hand for various purposes, including immediate needs and the treatment of acute or chronic diseases. Medical professionals give these drugs or are available over-the-counter in the pharmacy [1]. Since a large fraction of over-the-counter medications are purchased at home, they are frequently misused, may expire, or may be duplicated in self-medication, which increases the risk of self-medication relative to prescription drugs [2]. Additionally, indiscriminate drug use can result in resource waste, greater infection resistance, major health risks, persistent pain, an increase in unfavorable drug responses and interactions, and delays in getting the right therapy when mistakes have been made [2].

The likelihood of inappropriate self-medication may be enhanced due to his increased medication consumption and administration. Improper drug use can also lead to resource waste, increased disease resistance, significant health risks, wrong responses, and extended suffering [3].

Unaffordable access to medicine continues to be a significant worldwide health problem. According to a recent analysis, 13 middle-income nations and virtually all low-income countries could not afford a basket of 201 critical drugs based on per-capita pharmaceutical spending. The cost of the active pharmaceutical ingredient (API), also known as the raw medicinal substance, is typically the most significant factor in the production cost of pharmaceuticals [4].

The danger of toxicity can be decreased while ensuring that medicines are used as intended when stored properly. The effectiveness of our medications is influenced by how we store them [4]. The medical professional should give the patient instructions on appropriately storing and transporting their medications when taking them outside the home. For instance, drugs typically stored in the refrigerator can be put in a compact, insulated lunchbox. A healthcare professional should encourage the patient to keep medications in their original containers and to adhere to the label's safe storage guidelines. Care providers should speak to a community nurse, chemist, or the patient's doctor if they have any issues transferring a patient's medication [5].

Numerous studies from Brazil and other countries note the existence of medications and active ingredients that contaminate soil and water. However, some gaps make it difficult to comprehend why people retain drugs and the typical disposal techniques [6]. This study aimed to investigate or determine the storage conditions of medicines, usage habits, and cost of medications in households in Libya.

MATERIAL AND METHODS:

Collection of data and analysis: In this cross-sectional study, only 100 samples or houses that completed the questionnaires or had responses were recorded. Householders were informed before the study, which took place from September to November 2023.

Questionnaire forms were created in Arabic so all participants could respond quickly [7]. The final questionnaire included the following sections: First, there was demographic data on household storage of medicines in Libya . That had ten questions: the residences, the respondent in the household, the size of the family, the educational level of the household head, the monthly household income, whether a health care professional is present in the family, % of children < 5 years, % of people > 65 years, family members with chronic illness, and private or non-private insurance.

Second, there were different types of medicines found or stored in Libyan households, including seven types and others. Third, the places where drugs were stored were in Libyan households, which are five places.

Fourth, there were factors related to medications in Libyan households: source of drugs, labeling, and state of the expiration date. Fifth, there was the cost of medicines found in Libyan households, including the average cost (mean average with Libyan dinars) for drug products in use, unused daily, expired, unknown expired, and self-therapy with medicines.

RESULTS

A total of 100 participants or households randomly selected in Libya were visited, and as shown in Table 1, the demographic data of households were urban (88%) and rural (12%). The majority of the respondents interviewed were fathers (23%), mothers (18%), and others (59%). The size of the family was < 5 (23%) and > 5 (77%). The majority educational level of the household head was university education, followed by (23%), secondary education, and illiteracy (1%).
Also, table 1, showed that the monthly household income was medium (84%) followed (9%) which was low, then (5%) was high, and (2%) was nothing. A health care professional is present in the family was (62%), and % of children < 5 years was (31%), while (34%) was % of people > 65 years. There was (44%) of participants family members with chronic illness. Also (15%) of participants had private insurance, while (85%) did not have.

Table 1: Demographic data of households with home storage of medicines in Libya.

Characteristics	N (%)
Residence	
Urban	88
Rural	12
The respondent in the household	
Father	23
Mother	18

Others	59
Size of family	
5<	23
>5	77
The educational level of the household head	
Illiterate	1
Secondary education	23
University education	76
Monthly household income	
Low	9
Medium	84
High	5
Nothing	2
A healthcare professional is present in the family	62
% of children < 5 years	31
% of people > 65 years	34
Family members with chronic illness	44
Insurance private	15
Non-insurance	85

Table 2: Types of medicines found in Libyan households.

Types	N (%)
Analgesics	80
Anti-hypertension + heart diseases	36
Antidiabetics	38
For asthmatic	30
Anti epileptics	1
Endocrine diseases	1
Others	11

Table 2 showed the percent types of medicine stored in Libyan households: (80%) were analgesics, (36%) were anti-hypertension and heart diseases, (38%) were anti-diabetics, (30%) were asthmatics. Anti-epileptics and endocrine diseases were 1% for each and 11% for other drugs used.

There are several places of storage of medication showed in Table 3: That was (17%) in the drug store cabinet, (70%) in the refrigerator, (13%) were in several places around the house (kitchen and bedrooms), (87%) were drugs in their original packaging, and (13%) were drugs that were not in their original packaging.

Table 3: Places for drugs were stored in Libyan households.

Types	N (%)
In the drugstore cabinet	17
In the refrigerator	70
In several places around the house (kitchen and bedrooms)	13
Drugs in their original packaging	87
Drugs were not in their original packaging	13

For factors related to medications, Libyan households were the source of drugs (12%) from hospitals and (88%) from pharmacies or drug stores (table 4). Table 4 also showed that (89%) of participants had adequate labeling and (11%) had insufficient labeling. The state of the expiration date found for participants was (89%) not expired, (7%) expired, and (10%) not known (table 4).

Table 4: Factors related to medications in Libyan households.

Variable	N (%)
Source of drugs	
Hospital	12
Pharmacy or drug store	88
Others	0
Labeling	
Adequate	89
Not adequate	11
State of the expiration date	
Not expired	83
Expired	7
Not known	10

Table 5 shows the cost of drugs found in Libyan households, where the average Libyan dinar of drugs in use was 20000 dinars, drugs not used was 3000 dinars, and drugs expired was 1500 dinars, drugs not known expired date was 700 dinars, and drugs self-therapy was 9000 dinars.

Table 5: Cost of drugs found in Libyan households

Variable	Cost (mean average with Libyan dinars)
Drug products in use	20.000
Drug products not use	3000
Drugs expired	1500
Drugs not known expired date	700
Self-therapy with medicines	9000
Total drugs in 100 house	Total / 34200

DISCUSSION

Many types of drugs are stored in Libyan households. There were 100 households in total, with 88% being urban and 12%

being rural. Another study reported that many drugs are stored in households in Iran, Saudi Arabia, Belgium, Sudan, and Palestinian houses [8,9]. This study stored drugs for many diseases, such as hypertension, diabetes, and fever. According to other surveys conducted in Uganda and Iraq, most medicines present in homes (62%) were used primarily for ongoing treatments [1,10].

In our study, the respondent was a household father more than a mother, with the majority of family size > 5 and head of household with a university education. They demonstrated a favorable correlation between the quantity of drugs stored and the father's education level, indicating that persons with higher levels of education tended to keep more medications at home for later self-medicine. This can be explained by the fact that the poll in question was conducted in a city where access to educational institutions is more widespread and literacy rates are normally much higher than in rural areas [11].

Another study showed that having more pharmaceuticals saved at home for future self-care positively correlates with a father's education level, indicating that people with higher levels of education are more likely to do so. Those who lack literacy probably have poorer drug compliance rates, which results in less medicine usage and more medication stored at home. However, it's also plausible that educated people are more likely to self-medicate and keep more drugs on hand at home [12].

Also, in our study, the storage of medicine was related to the presence of a health care professional in the family (62%) and related to the presence of children < 5 years old or people > 65 years old. So, there needed to be more types of drugs available to treat respiratory tract infections, among others. And also to treat family members with chronic illnesses. 44% had chronic diseases such as hypertension, diabetes, heart disease, and others. Similarly, another study found that patients with various co-morbid disorders typically consume a more significant number of prescriptions and tend to switch their medications more frequently. It was also hypothesized that the prevalence of chronic diseases would be correlated with the number of medicines kept. In our study, the amount of drugs kept on hand was connected with family size in a favorable way [13].

The storage of medicine was also related to monthly income. However, in our study, most of them had a medium income, and most of them had no private insurance. Another study indicated that the amount of medications kept at home appears to be more strongly influenced by the presence or lack of medical insurance than by family income. Actually, the majority of wealthy households often have private insurance [13].

In this study, the majority of the drugs stored in Libyan households were analgesics, anti-hypertension and heart diseases, diabetes, and asthmatics. Most of them are related to chronic illnesses. According to another survey, analgesics and antibiotics were the drug classes that were most frequently kept in home storage. Numerous research, in particular, reported on the preservation of antibiotics [2,14]. According to previous surveys, analgesics are the most popular drug class stored at home [15,16]. In Qatar,

analgesics were the most often kept pharmaceuticals at home, followed by anti-inflammatory drugs, allergy, cough, and cold treatments. The most often used pharmaceuticals in Iran were those that affected the central nervous system, followed by anti-infectives and gastrointestinal therapies [17].

In our study, we found that most drugs stored in refrigerators were 70%, followed by drugstore cabinets and then in several places in the house. On the other hand, 87% of drugs were kept in their original packaging, about 87%, while 13% were not in their original packaging. Another survey found that whether or not it was the proper place, over half of homes kept their medications in the refrigerator. Depending on the medication, different locations should be used for storage. For instance, antibiotic suspensions should be kept cool but not frozen after preparation [18].

In contrast, adult cold medications should be kept at room temperature in a kitchen or bedroom cabinet. The kitchen cabinet was the second-most popular storage location . Not all medicines belong in the refrigerator, and even those that should be stored there should not be frozen according to the instructions on the box inserts. Additionally, it's important to make sure that youngsters cannot reach medications housed in refrigerators [18].

For the source of drugs in our study, we found most of them from pharmacies or drug stores (88%), and from hospitals (12%). And also adequate labeling that is not expired. Numerous studies have examined the percentage of expired pharmaceuticals. In contrast, one Ethiopian study examined the percentage of households that contain at least one such drug. Five percent of the medications that were being stored there were determined to be outdated, according to a research. However, studies carried out in other countries in the Middle East and Sudan have noted large percentages of outdated medications (8). To lessen the effects of expired pharmaceuticals on the community's health, public education about the nature and risks of expired drugs is necessary, as is the proper disposal of unused medication [18].

For the cost of drugs stored in Libyan households in our study, we found 34200 dinars in 100 households in Libya. That means less than the cost of another study; in the 415 households, drug waste costs a total of 34000 USD. In the West Bank of Palestine, where there are an estimated 500000 households, the total amount of wasted drugs comes to almost 19 million USD. Drug wastage ranged from 38.8% in the Iranian study to 25.8% in Saudi Arabia and 41.3% in other Gulf nations. Iran's drug waste from homes was estimated to be worth USD 30 million this values is near in Jordon also [19].

CONCLUSION

The prevalence of household drug storage in 100-libya households was analgesics, antihypertension, and antiasthmatic. Most drugs kept at home were not appropriately labeled or stored in a safe place.

The residence and the presence of health professionals in the households were found to be associated with drug storage at home. Drug sharing and hoarding were linked to the presence of older adults over the age of 65 and family members who had a chronic disease. Drug hoarding was linked to higher monthly income and the

presence of young children under the age of five.

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Ethical approval

We were received ethical aproval number 2923\ from Department of pharmaceutics and pharmaceutical industry, Faculty of Pharmacy, University of Zawia, Libya, which shpport the humanity of our research according to declaration of Helsinki

Conflict of interest

None

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