

Parental perception of medications safe storage in the State of Qatar

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ABSTRACT

Purpose: The purpose of this study is to identify parental perception of household medication storage. **Methods:** A prospective cross-sectional study utilizing a questionnaire was carried out at Hamad Medical Corporation, the solely tertiary pediatric hospital in the State of Qatar at the time of the study. Qatar is a young developing country with limited data on the awareness of medication storage among adults with children at home and on the safety practices regarding medication storage. **Results:** Three hundred and five questionnaires were completed. The vast majority of parents were married, one-third of them were males, and more than three quarters were college graduates and younger than 40 years of age. Almost 80% of the parents had more than three children but less than seven. In addition, 23% of participants were health-care workers. Almost 90% of the participants stored medications in a place that is easy to reach. However, the same percentage stated that those medications were stored in a locked place and that children did not have access to them. Approximately 10% of caregivers store multiple medications in one bottle, and the same percentage of participants do not check the expiration date on the medication labels. In terms of the most common medications stored at home, antihypertensives were on top of the list. Our study has shown that parental education and being a health-care worker were each associated with the difficulty in reaching medications ($P=0.006$ and $P=0.011$, respectively). Moreover, the percentage of participants who shared medications was significantly higher among those who were not working in the health-care section compared to those who were ($P=0.004$). In addition, being a female parent and a college graduate was associated with the possibility of keeping excess or leftover medications at home ($P=0.025$). **Conclusion:** Parents residing in the State of Qatar have some deficiencies in knowledge about medication storage. Parent's attitudes and perceptions are deemed vital objectives for population's health intervention.

Keywords: Children, medication, pediatric, Qatar, storage

Introduction

Home accidents are grave public health issues in pediatrics. They account for a large proportion of morbidity and mortality

in the pediatric population.^[1] In the United States, 47% of calls received by poison control centers are concerned about children below 6 years of age.^[2]

In the United States, there are more than 1.4 million poisonings in children and adolescents per year.^[3] While in the State of Qatar, a cross-sectional study has shown that there were 1179 registered pre-school children poisoning cases in the main emergency department of the country in between 2009 and 2012.

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Those cases accounted for 0.22% of all emergency department visits.^[4] The State of Qatar is an independent peninsula in the Gulf Region. It is terrestrially bordered only by Saudi Arabia and has common maritime borders with Iran, Bahrain, and the United Arab Emirates. The nation covers an area of 4473 sq. mi (11,586 km²) with a population of 2.8 million.^[5]

Medications are globally obtained by prescription or over-the-counter with the purpose of treating acute or chronic diseases.^[6,7] The utilization of many medications leads to unsafe medication storage practice, causing improperly stored medications or misuse of such drugs.^[8,9]

According to the Good Distribution Practice Guidelines, the storage of medications should be carefully scrutinized and firmly controlled during all the stages of the medical supply chain.^[10,11] However and unfortunately, in many countries, lack of knowledge exists among cultures on the safe and proper storage of medications, causing unsafe medication use.^[12]

Only few investigations have studied the parental perception and practice of medication storage. This is the first study in the State of Qatar to delineate such practices and perceptions.

Study Design, Period, Setting, and Participants

A cross-sectional study utilizing a questionnaire was carried out at Hamad Medical Corporation (HMC), the only academic hospital in the State of Qatar at the time of the study. Our objective participants included caregivers of a child or children aged >1 year and <14 years. The plan was to enroll 300 parents. The study was conducted between February 10, 2019, and January 31, 2020, and encompassed all children aged >1 year and <14 years who visited our outpatient clinics for well-child and sick visits and children who were hospitalized in the inpatient general pediatric ward.

We have utilized an anonymous modified interview-based assessment of parental knowledge, acceptability, and preferences of proper storage of medications. The content of the questionnaire was extrapolated from several published investigations^[13-15] and adjusted them to represent our patient population.

The Medical Research Center (MRC) at HMC validated the questionnaire that was composed of a total of 19 items. These questions focused on parents and children demographics, medication-sharing habits, parental practice, and attitude toward

medication storage. Participants were recruited via personal contact during their presence in the outpatient general pediatric clinics and inpatient pediatric wards. Every parent with a child aged 1–14 years was eligible to contribute. Verbal informed consent was acquired at the time of the encounter and an information sheet that clarified the study was given to all caregivers. All resources were available in Arabic and English. We have informed parents as to why the information was being gathered. Before completing the questionnaire, we have instructed caregivers that their participation was optional and that their responses were confidential.

Participants did not receive any type of compensation for contributing in the study. This study was approved by the MRC and institutional board review at HMC with reference number MRC-01-18-143.

Statistical analysis

Qualitative and quantitative data are exhibited as frequencies along with percentages and mean \pm standard deviation, and median and range. Descriptive statistics were used to curtail demographic and all additional descriptions of the participants. Correlations between two or more qualitative or categorical variables were evaluated using Chi-square test. Pictorial presentations were utilized to simplify the presentation of results. A two-sided *P* value <0.05 was contemplated to be statistically significant. All statistical analyses were carried out using statistical package SPSS, version 19.0 (IBM Corporation, Armonk, NY, USA).

Results

Three hundred and five questionnaires were completed. The vast majority of parents were married, one-third of them were males, and more than three quarters were college graduates and younger than 40 years of age. Almost 80% of the parents had more than three children but less than seven. In addition, 23% of participants were health-care workers.

Almost 90% of the participants stored medications in a place that is easy to reach. However, the same percentage stated that those medications were stored in a locked place and that children did not have access to them.

Approximately 10% of caregivers store multiple medications in one bottle, and the same percentage of participants do not usually check the expiration date on the medication labels. Table 1 displays parental practice regarding medication storage. In terms of the most common medications stored at home [Figure 1], antihypertensives were on top of the list.

Table 1: Parental attitude toward some statements regarding medication storage [n (%)].

	Yes	No	I don't know	Not applicable
My child has access to medications at home	37 (12.1%)	254 (83.3%)	11 (3.6%)	0
Ingesting adult medication can harm my child	258 (84.6%)	18 (5.9%)	22 (7.2%)	0
Small amount of adult medications can harm my child	239 (78.4%)	26 (8.5%)	33 (10.8%)	1 (0.3%)
I have excess left over medications at home	175 (57.4%)	98 (32.1%)	21 (6.9%)	0

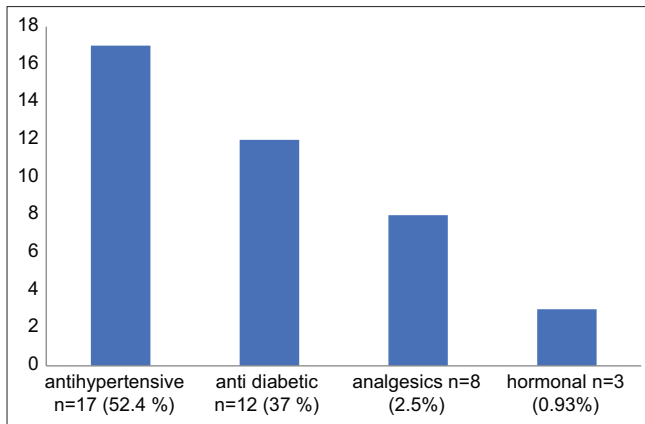


Figure 1: Types of medications stored at home

Our study has shown that parental education and being a health-care worker were each associated with the difficulty in reaching medications ($P = 0.006$ and $P = 0.011$, respectively).

Moreover, the percentage of participants who shared medications was significantly higher among those who were not working in the health-care section compared to those who were ($P = 0.004$). In addition, being a female parent and a college graduate was associated with the possibility of keeping excess or leftover medications at home ($P = 0.025$). The rest of the associations between the sociodemographic factors and questions related to parental practice of medication storage were not statistically significant ($P > 0.05$).

Discussion

The aim of this study was to evaluate the knowledge, attitudes, and storage practices of unused medications in the State of Qatar. The results of this study are important because they can be used to counsel the community about potential harms of medication storage. Parents or caregivers play an important role in pediatric medicine. They are in a special position to convey the status of their children's conditions, and they are the ones who usually accept or reject suggested treatments. According to a study conducted in the State of Alabama, unsafe practices regarding medication storage resulted from lack of knowledge rather than lack of concern.^[16] Parental views, practices, and attitudes might differ from those professed by clinicians or policy-maker personnel.^[17] Therefore, delineating parental perceptions, attitudes, and practices is essential in developing curriculums and interventions to decrease barriers when establishing patient-centered care.

Improper use of medications can lead to intoxication, increased resistance to antibiotics, or the general surfacing of adverse drug effects or reactions. In this study, we found most of the medications stored in the homes were from the category of antihypertensive, followed by antidiabetic which could be lethal even in small doses. Our results are different from those of other studies. For instance, Okumura *et al.*^[7] studied drug utilization and

self-medication in rural Vietnam. The study showed that a total of 96 different antibiotics were kept at home. In addition, a study conducted in Sri Lanka found out that the majority of medication accidental ingestions were caused by analgesics (35.6%), followed by anticonvulsant (14.6%) antihypertensive (7.6%) drugs.^[9]

The reason for the discrepancy in results among studies could be attributed to the fact that our culture counts more on the clinician's prescription rather than over-the-counter drugs. Moreover, the Ministry of Health in Qatar is very strict about antibiotic prescriptions and antibiotic stewardship. These two factors played large roles against storing antibiotics in households in the State of Qatar.

The expiration dates on the labels of prescribed or over-the-counter drugs stipulate the end of the functional life of the medications.^[18] Our participants paid very good attention to the expiration date. The high rate could be due to the well-educated sample and perhaps due to easily visible and colorful labels dispatched by pharmacists. Expired drugs can lead to secondary side effects. For instance, expired tetracycline can cause transaminitis and kidney injury.^[19]

The location of household medication storage is also a cardinal factor to assess. Storing drugs in incorrect places or in places that are easily reachable is deficient medication storage practice.^[8] The improper storage of drugs can obviously cause health adverse effects in children and result in misused resources.^[20]

Sociodemographic characteristics can have an impact on the household storage of medicines.^[21] Our sample showed that being a female was associated with keeping excess or leftover medications at home. This is consistent with a study conducted in China.^[22] However, the study conducted in China included a sample where women were less educated than men. In our sample, women were highly educated. The reason for the ill practice of medication storage among our female participants could be the central part that females play in keeping the good health states of family members, a practice that is commonly witnessed in this part of the world.

Most of our participants showed good general understanding about medication storage. In addition, the current study showed that people with higher level of education, especially college graduates, had better understating of the proper ways of handling and storing medications. Despite this, education level was only significantly related to the behavior of storing medications in easy-to-reach places and keeping excess leftover medications at home. Level of education was not significantly related to other behaviors of handling, including storing medications in locked place and mixing medications in one bottle.

It was also found that most respondents lived at home with family members ranging from 3 to 7 people. We believe this number of inhabitants in a single household can increase the number of stored medications at home and augment the risk of child

accidental ingestion. This finding concurs with a study done in our neighbor country, the Kingdom of Saudi Arabia.^[13]

Almost one in six (57.4%) of our participants stored unused medications at home, and there was a significant association between storing leftover medications at home and being a parent of children less than 6 years old ($P = 0.025$). Our results were comparable to those of an Ethiopian study which revealed 52.4% had unused medications at home.^[23]

Preventing inadvertent child poisoning requires multidisciplinary approach involving clinicians, pharmacists, parents, and caretakers. The vast majority of emergency department visits by poisoned preschool children are due to easy access to medications.^[24,25] The literature has shown that educational interferences to decrease the behaviors and risk factors that lead to childhood injuries are efficient, indicating the urge for continuous education of parents and caregivers related to the risks for inadvertent medicine poisoning in children.^[26]

A study was conducted in the United States to evaluate the knowledge and practices among patients receiving opioids; results revealed that patients who received counseling about proper storage of medications kept their medicines in locked place, compared for those who didn't ($P < 0.00001$)^[27]

Public tutoring is important to this topic. Establishing awareness campaigns and using social media can have an effect of proper storage of medications. Universal guidelines can be used as a guide to stipulate commendations on safe and appropriate storage medications. The State of Qatar is a very well-resourced country, and campaigns especially via social media will certainly be successful and feasible.

Limitation

This study should be construed carefully for certain reasons. This study is descriptive cross-sectional design and therefore it cannot utterly establish associated factors with attitude, knowledge, and practice of the participants. Moreover, a self-administered questionnaire was utilized and recall bias of storage practices could be an issue.

Conclusion

Parents residing in the State of Qatar have some deficiencies in knowledge about medication storage. Parent's attitudes and perceptions are deemed vital objectives for population's health intervention. Our subsequent step is to share our results with the Ministry of Health to increase awareness about proper storage of medicines in Qatar.

Key points:

- Parents showed unsafe practices of handling medications.
- Parental education about safe handling of medications resulted in better storage practices.

- Most of medications stored at homes are prescription medications, such as antihypertensive and antidiabetic drugs.
- The majority of participants checked expiration date and this could be attributed to very clear labels on medication packages.
- Living at homes with three to seven family members is a risk factor for accidental ingestion.

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Clinical trial registration

None.

Table of contents summary

This study describes parental practice of medication storage in Qatar.

Ethical approval

The medical research center and IRB of Hamad Medical Corporation approved this study (number: MRC-01-18-143).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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