



Patients' Knowledge and Attitude toward the Disposal of Medications

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Introduction :

Some international and national studies showed that most patients stored their medications improperly at home that may lead to undesirable effects or unintentional risks like improper self-medication, accidental overdose, and prescription drug abuse

medication wastage considered a universal problem and has a significant impact on the cost of health care. clearly stated in the guidelines that "No drugs should be donated that have been issued to patients and then returned to a pharmacy

Another method of disposal to return expired, unwanted, or unused medication to a local pharmacy and clinic or to a health care provider for safe department at KAMC. Jeddah,

Patients usually receive instructions on how to and store medications, but rarely do they get proper information on the safe and appropriate ways to dispose such medications

Thus, we conclude that this problem must be prevented. We conducted this study explore the knowledge and practice toward disposal of medication among patients

Ethical Consideration

This project received approval from the institutional review board of King Abdullah International Medical Research Center Protocol # RJ13/001/J in an approval document memo.

Methods:

A cross sectional study was carried out in Jeddah based on data collected from questionnaire under guidance of international guidelines of medications .

two languages were used in this questionnaire including Arabic and English ,with random selection of participants .

Questionnaire was divided to two parts , the first part concerned demographic information (sex , age, educational level) .

regarding the second part which included 8 questions to assess **Partic –Impants** attitude toward medication disposal .

The questionnaire was distributed by study survevors

- ❑ Participants were randomly selected without any specific methods of recruitment. Any individual entering any of the selected outpatient pharmacy waiting areas during working hours (08:00–17:00) was invited to participate in the study.
- ❑ The participants are comprised of patients, family members, and working staff, aged 16 years and older, and who were able to communicate and understand questions.
- ❑ KAMC, Jeddah, is a 751-bed, tertiary care hospital and provides medical services for the Saudi Arabian population in the western region.
- ❑ The pharmaceutical care services department at KAMC, Jeddah, provides pharmacy outpatient services in four different areas (ACC, ONC, CC, and FD) and receives at least 2500 patients on a monthly

Results :

A total of 1171 participants completed the question are

ACC =
902

ONC =
187

CC = 55

ED = 27

Female 52% →

about 30% →

about 23% →

male 48% participant

between 26 to 35 years

between 36 and 45 years.

TABLE 1: Demographic data of participants from the different pharmacy outpatient study areas.

Demographic data of participants	Study area									
	ACC <i>n</i> = 902		ONC <i>n</i> = 187		CC <i>n</i> = 55		ED <i>n</i> = 27		Total <i>N</i> = 1171	
Gender	M = 401 (44%)	F = 501 (56%)	M = 91 (49%)	F = 96 (51%)	M = 49 (89%)	F = 6 (11%)	M = 26 (96%)	F = 1 (4%)	M = 567 (48%)	F = 604 (52%)
Age (years)										
16–25	77	111	12	10	3	2	1	0	93	123
26–35	100	157	37	30	15	4	10	0	162	191
36–45	107	111	20	18	10	0	7	1	144	130
46–55	55	77	11	20	8	0	3	0	77	97
56–75	49	38	10	15	11	0	3	0	73	53
≥76	13	7	1	3	2	0	2	0	18	10
Education										
Not stated	6	5	3	14	0	0	1	0	10	19
Never went to school	13	54	0	1	2	0	0	0	15	55
Primary school	30	59	3	14	5	0	1	1	39	74
Intermediate/ Secondary school	152	150	39	29	21	3	12	0	224	182
Diploma	22	18	9	3	3	0	1	0	34	21
Bachelor degree	133	203	29	28	14	4	8	0	184	235
Postgraduate study	31	25	8	8	1	1	3	0	40	34

M = Male, F = Female, ACC = Ambulatory Care Center, ONC = Oncology, CC = Cardiac Center, ED = Emergency Department.

Participants' Disposal Practice. There were **six main disposal methods practiced by the respondents**

- 1) remove in garbage as the most commonly practiced method 27.8%
- 2) participants who reported returning unused 13.6%
- 3) storing them at home 5.3%
- 4) flushed the medications down the sink 4.6%
- 5) shared or gave away their medications to other people or to a charity 2.6%
- 6) burned the leftover medications (expired, unwanted, or unused) 1.1%

Result of Ambulatory Care Center (ACC) and Oncology Department (ONC)

(ACC)

A total of 902 participants completed the questionnaire

75% disposal in the garbage

4% flushing them down the sink

5% storing the unused at home.

12% returning them to a pharmacy

1% burning them

(ONC)

A total of 187 participants completed the questionnaire

68% disposal in garbage

4% flushing them down the sink

5% storing the unused at home.

22% returning them to a pharmacy

1% sharing them with friends

TABLE 2: Methods of disposal of medications by respondents of the Ambulatory Care Center (ACC).

Disposal method	ACC (N = 902)		
	Total n/N (%)	All medications (%)	Expired only (%)
Thrown away in the trash/garbage	673/902 (75%)	419/673 (62%)	254/673 (38%)
Flushed down the sink/toilet	40/902 (4%)	29/40 (73%)	11/40 (27%)
Return to a pharmacy/clinic	109/902 (12%)	92/109 (84%)	17/109 (16%)
Given away to friend/charity	22/902 (3%)	15/22 (68%)	5/22 (23%)
Stored/never disposed	48/902 (5%)	48/48 (100%)	—
Burned	10/902 (1%)	7/10 (70%)	3/10 (30%)

TABLE 3: Methods of disposal of medications by respondents of the oncology department (ONC).

Disposal method	ONC (N = 187)		
	Total n/N (%)	All medications (%)	Expired only (%)
Thrown away in the trash/ garbage	127/187 (68%)	94/127 (74%)	33/127 (26%)
Flushed down the sink/toilet	8/187 (4%)	8/8 (100%)	—
Returned to a pharmacy/clinic	40/187 (22%)	33/40 (83%)	7/40 (17%)
Given away to friends/charity	2/187 (1%)	2/2 (100%)	—
Stored/never disposed	10/187 (5%)	10/10 (100%)	—
Burned	—	—	—

RESULT OF CARDIAC CENTER (CC) AND EMERGENCY DEPARTMENT (ED)

(CC)

A total of 55 participants completed the questionnaire

60% disposal in the garbage

7% flushing them down the sink

4% burning them

13% returning them to a pharmacy

9% reported sharing them with friends

(ED)

A total of 27 participants completed the questionnaire

74% disposal in garbage

8% flushing them down the sink

4% burning them

11% returning them to a pharmacy

4% sharing them with friends

TABLE 4: Methods of disposal of medications by respondents of the Cardiac Center (CC).

Disposal method	CC (N = 55)		
	Total n/N (%)	All medications (%)	Expired only (%)
Thrown away in the trash/garbage	33/55 (60%)	23/33 (70%)	10/33 (30%)
Flushed down the sink/toilet	4/55 (7%)	4/4 (100%)	—
Returned to a pharmacy/clinic	7/55 (13%)	5/7 (71%)	2/7 (29%)
Given away to friends/charity	5/55 (9%)	5/5 (100%)	—
Stored/never disposed	4/55 (7%)	4/4 (100%)	—
Burned	2/55 (4%)	2/2 (100%)	—

TABLE 5: Methods of disposal of medications by respondents of the Emergency Department (ED).

Disposal method	ED (N = 27)		
	Total n/N (%)	All medications (%)	Expired only (%)
Thrown away in trash/garbage	20/27 (74%)	17/20 (85%)	3/20 (15%)
Flushed down the sink/toilet	2/27 (8%)	1/2 (50%)	1/2 (50%)
Returned to a pharmacy/clinic	3/27 (11%)	3/3 (100%)	—
Given away to a friend/charity	1/27 (4%)	1/1 (100%)	—
Stored/never disposed	—	—	—
Burned	1/27 (4%)	1/1 (100%)	—

Ministry of National Guard Health Affairs (MNGHA) from Jeddah

- ❑ participants reported facing a difficulty in transportation to the hospital
- ❑ Half of the respondents (50%) thought the right method of disposing medications was to give them to charity institutions
- ❑ More than 80% respondents that they never received any safe information and proper disposal of medication
- ❑ Leftover Medications That Are Not Disposed in 1864 to nine different medication categories were stored at home

That Are Not Disposed in 1864 to nine different medication categories

TABLE 6: Provision of education on safe disposal of medications by healthcare providers.

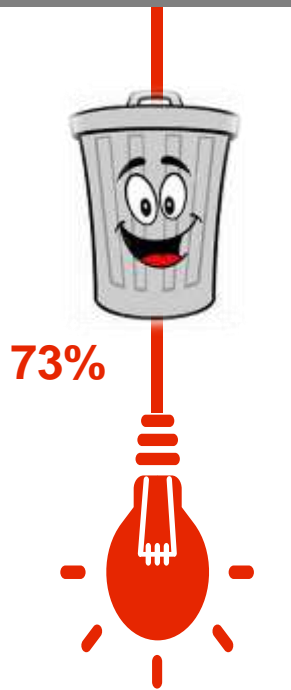
Study area (N)	Percentage of people who received education on medication disposal		
	Yes	Not sure	Never
ACC (902)	112/902 (12%)	37/902 (4%)	753/902 (84%)
ONC (187)	26/187 (14%)	9/187 (5%)	152/187 (81%)
CC (55)	12/55 (22%)	2/55 (4%)	41/55 (74%)
ED (27)	5/27 (18%)	1/27 (4%)	21/27 (78%)
Total (1171)	155/1171 (13%)	49/1171 (4%)	967/1171 (83%)

Discussion :

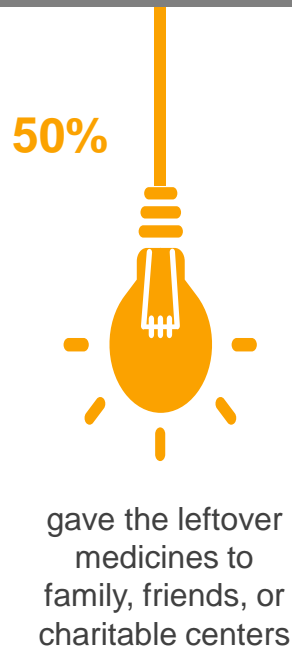
In Saudi Arabia, there is neither a uniform or standard system that accepts and collects unwanted, or unused medications, nor recycling systems for medication disposal.



Our study showed :



73%
discarded leftover
unused
medications by
throwing them in
the trash



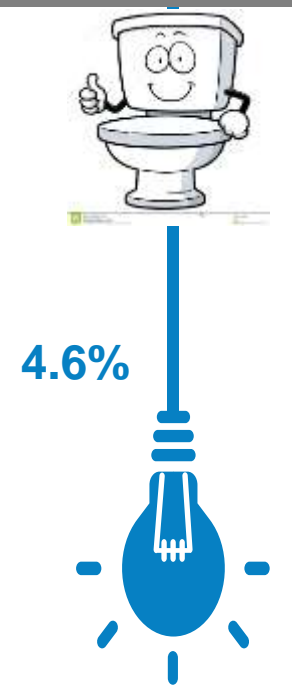
50%
gave the leftover
medicines to
family, friends, or
charitable centers



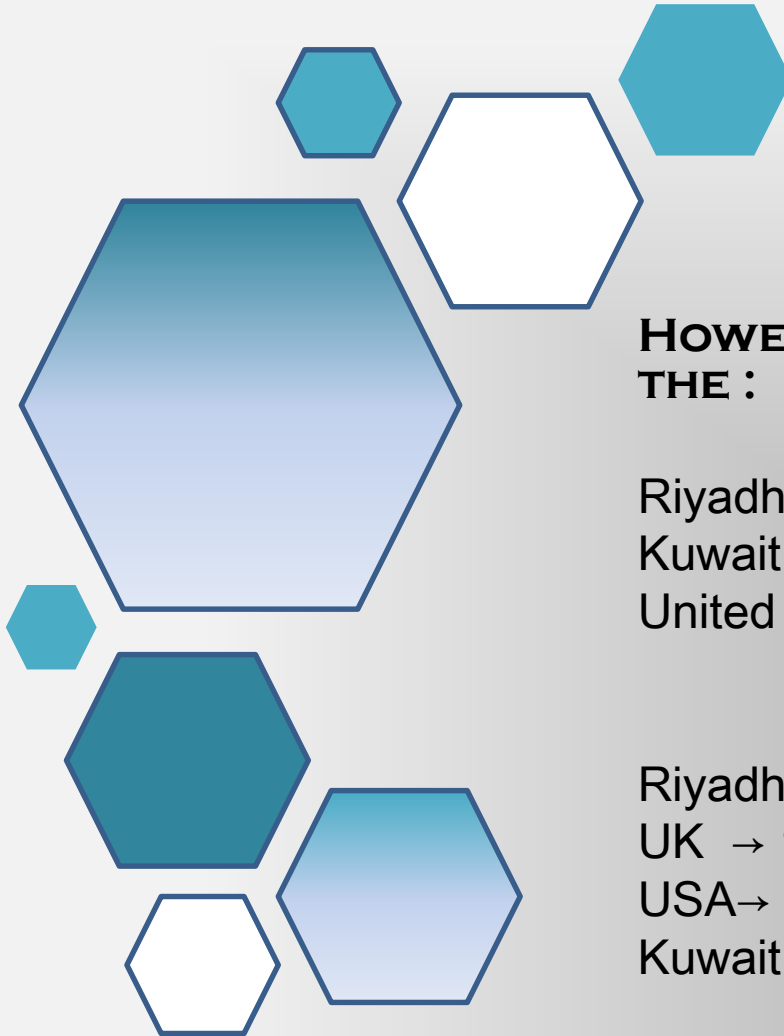
14%
were disposing of
the leftover
medicines by
returning them to
the pharmacy.



5.2%
they store
medications in
the fridge or
closet and never
dispose them.



4.6%
they disposing of
the leftover
medicines by
washing
medications in
the sink or toilet



HOWEVER, IN OTHER STUDIES SHOW THAT THE :

Riyadh → 79%
Kuwait → 77%
United Kingdom (UK) → more than 60%



Riyadh → 7%
UK → 11%
USA → 26%
Kuwait → 11%



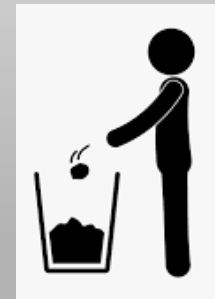
❑ When we asked the participants about the type of leftover medications kept at home



✓ 15% of the CC respondents said they have anticoagulation drugs and blood thinners at home, and throwing them in the garbage was the most common practice (60%).



✓ From the ONC department :
18% respondents had oral
chemotherapeutic drugs



(%68)

16% had opioids/pain killers

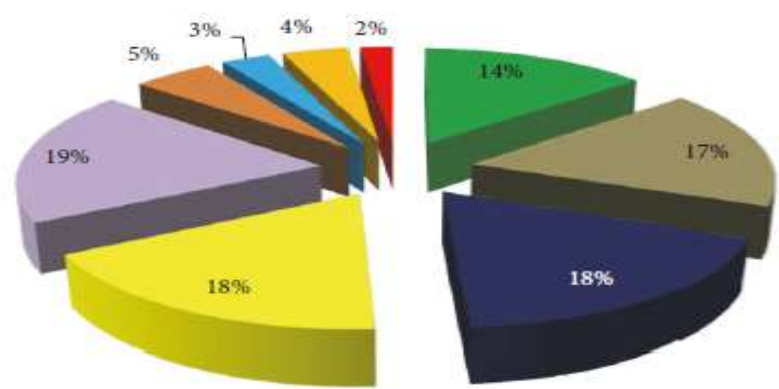
3% had anticoagulation drugs or
blood thinners



(%5)

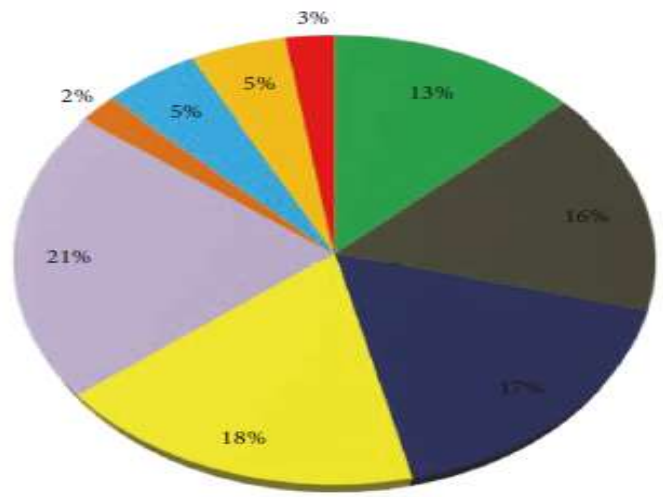


(%3)



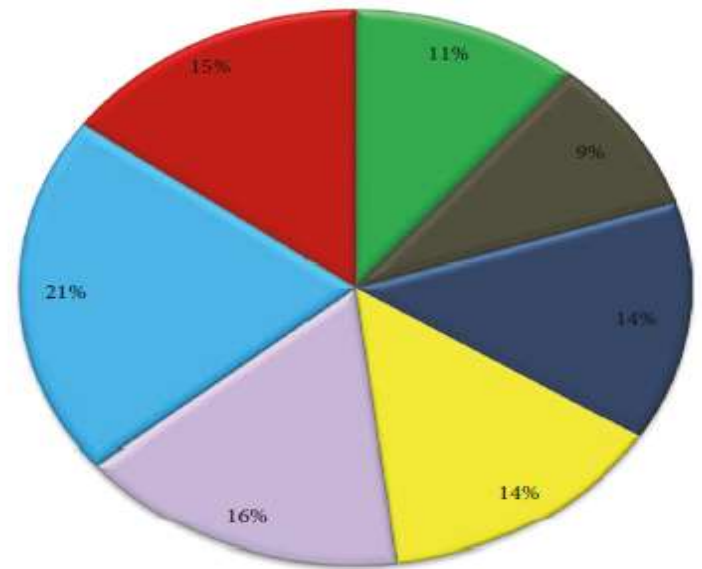
- Antibiotics
- Opioids/pain killer
- Antipsychotics
- Chemotherapeutic agents
- Antacids
- Inhalers
- Antihypertensive/cardiac drugs
- Hypoglycemic drugs
- Anticoagulation/blood thinner

FIGURE 1: Medication categories (%) of drugs from the Ambulatory Care Center (ACC).



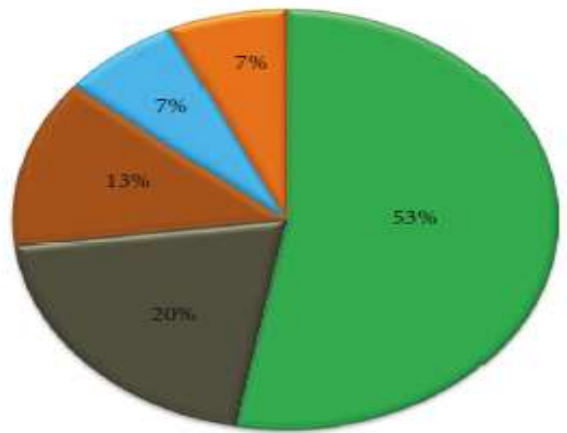
- Antibiotics
- Opioids/pain killer
- Antipsychotics
- Chemotherapeutic agents
- Antacids
- Inhalers
- Antihypertensive/cardiac drugs

FIGURE 2: Medication categories (%) of drugs from the Oncology Department (ONC).



- Antibiotics
- Opioids/pain killer
- Antipsychotics
- Chemotherapeutic agents
- Antacids

FIGURE 3: Medication categories (%) of drugs from the Cardiac Center (CC).



- Antibiotics
- Opioids/pain killer
- Inhalers
- Antihypertensive/cardiac drugs
- Hypoglycemic drugs

FIGURE 4: Medication categories (%) of drugs from the Emergency Department (ED).

In general, more than 80% of participants across all study areas said they never received information for the proper and safe disposal of medications.

And therefore :

- Health care providers should enroll in educational programs for the safe disposal of medicines and provide this information to patients when they visit.
- If pharmacists provide information about proper disposal while consulting a medication, the patient will develop positive disposal practices for medications.
- Collaborative, nationwide, and awareness campaigns should be organized using social media.



Conclusion

Different drug disposal techniques were identified in our study. Our pharmacy department has a policy for returned medication from patients but lacks specific policies for proper and safe disposal of expired and unwanted. Safe disposal instructions should be provided by all healthcare providers in routine patient education.

Reference

AlAzmi A.1, AlHamdan H.1, Abualezz R.2, Bahadig F.1, Abonofal N.1 & Osman M1. (2017) . Patients' knowledge and attitude toward the disposal of medications. *Research Article* , 9, 1-9