Original Research Article

AWARENESS TOWARDS DISPOSAL OF UNUSED MEDICATION IN DISTRICT SHAHEED BENAZIR ABAD SINDH.

ABSTRACT.

Aims: The purpose of this study was to examine level of awareness about proper disposal of unused medicine. The improper disposal of unused medicine is a growing problem. People directly dispose unused medicines into waste which mix into wastewater leach out into sea water, ground water and effect human and other forms of life. Confusion exists in people about proper disposal of unused medicine. However, there are various guidelines already available for safe disposal of unused medicine, yet they are rarely followed, in particularlydeveloping countries. It is well established fact that knowledge and level of awareness play pivotal role for practice of proper disposal methods.

Study design: This study was a descriptive cross-sectional study.

Place and Duration of Study: This research was conducted in Nawab Shah and its vicinities: Sakrand, Kaziahamed, Bachalpur, during September 2019 to May 2020. **Methodology:** We assessed the level of awareness about proper disposal of unused medicine of 400 participants through a well-designed questionnaire. The questionnaires were distributed to the participants at their homes with the help of volunteers. The descriptive statistics were analyzed through latest version of MS excel 2016.

Results: In this study majority of the participants were male, were between 16 to 70 years with mean age of 30.26 years had at least Primary level of education. Out of 400, 320 (80%) of the participants admitted have no knowledge for proper disposal of unused drugs. 185 (46.25%) of the participants viewed throwing unused drugs into waste was correct. Whereas 176 (44%) of the participants believed improperly thrown medicines has no effect on environment.

Conclusion: The level of knowledge about proper disposal of unused medicine was found very low in study participants. It is suggested government should incorporate guidelines about the harmful effects of improper disposal of unused medicines in curriculum at primary level of education.

Keywords: *Unused, Medication, Improper, Disposal, Sindh.*

INTRODUCTION

Due to relieve of symptoms or progress of illness , alteration in dosage form or medicines reaching the expiry date, are few of the many reasons for which medicines goes unused [1-

[3]Medicines are called unused when they are not fully consumed [4].The quantity of unused medicine is not only an economical burden [5] but it become inexorable threat to human and whole ecosystem, if disposed improperly [6]The hefty quantities of unused medicines [7] at home create disposal problems [8] whereas many of the medicine consumers are not aware of proper disposal methods as a consequence unused medicines are improperly disposed[9-11].These improperly disposed medicines comprise on various classes of medicines**[12-16]** after improper disposal these medicines get into the environment **[17, 18]**.

According to WHO guidelines improper disposal of unused medicines is unsafe and it is environmentally injurious**[19]**The improperly disposed medicines may result accidental poisoning**[20]** anti-microbial resistance and genetic effects on human and innumerable effects on aquatic life **[21-27]**.However currently waste water treatment plants are available but latest studies have shown they are not efficient in removing or degrading active pharmaceutical ingredients (APIs).During treatment processes many (APIs) even leach out again into environment. There have been substantial evidences of presence of traces of medicines in ground, and surface water **[28-30]** .Interestingly the pharmaceuticals which were detected in water ways were numerous and belonged to various classes of pharmaceuticals such as anticonvulsant, antibiotics painkillers, and synthetic hormones **[31-33]**.

The improper disposal of unused medicine is due to lack of awareness and proper guidelines [34] It is a global problem. Although in developing countries problem is escalating and is not well documented[35, 36] on the other hand in developed countries for instance, Canada Australia, and United Kingdom has drug return programs at national level [37]. Besides this the FDA advocates best way for disposal of unused medicines are drug take back programs but in case, lack of such services mixing prescription drugs with an undesirable substance or flushing certain listed medicines is however allowed [38].Despite of presence of such guidelines people practice improper disposal methods [39-41] Whereas medicine user are seldomly informed about proper disposal methods.[42-44].The available

scientific literature agrees that the improper disposal of unused medicines is unequivocally due to lack of knowledge and awareness about proper disposal of unused medicine [45, 46].The objective of this study was to examine how people dispose unused medicines and document the level of awareness about proper disposal of unused drug in residents of Shaheed Benazir Abad Sindh.

MATERIALS AND METHODS.

Study design.

This study was a descriptive cross-sectional study

Participants.

We assessed the practice and level of awareness about proper disposal of unused medicine of 400 participants through a well-designed questionnaire [9]. The purpose of the study was introduced to the participants. The questionnaires were distributed to the participants at their homes with the help of volunteers. After filling questionnaires participants returned these questionnaires to volunteers and later were assessed. This research was conducted during September 2019 to May 2020 mostly in homes and public places in the following cities and their vicinities: Nawab shah, Jam sahib, Sakrand, Kaziahamed, Bachalpur and Daultpur.

Procedure.

Each participant was given a questionnaire, which in beginning stated purpose of the study and later participants were asked to answer the questions regarding surveys objective. Questionnaire states as-The objective of this study is to know how many people practice proper disposal of unused medicine. If you are willing to answer the questions please give true and genuine answer of the following questions. Participants were asked (1) Do you have any unused medicine at home? (2) What is the name and dosage form of unused medicine at home? (3) Why did you left taking medicine? (4) What do you do with unused

medicine? (5) How you dispose unused medicine? (6) Do you know proper disposal methods? (7) Do you know disposing unused medicine into waste is harmful? (8) Do you know disposing unused medicines into waste has any effect on environment? (9). Some questions were open ended so as participants can write more insights. Descriptive statistics were analyzed through latest version of MS excel 2016.

Results and discussion

In this study majority of the participants were male, were between 16 to 70 years with mean age of 30.26 years. Were single had at least Primary level of education, were unemployed (Table 1).

Table 1. Demographic Characteristics.

Variables	Category	No: Ofparticipants	Percentage
Gender	Male	300	75
	Female	96	24
	Transgender	4	1
Age	16-30 Years	244	61
	31-45 Years	96	24
	46-65 Years	28	7
	66-70 Years	32	8
Marital status	Married	180	45
	Unmarried	212	53
	Widow	8	2
Education Level	Uneducated	40	10
	Primary	72	18
	Graduate	76	19
	Matric	104	26
	Intermediate	108	27
Residential area	Small Towns	104	26
	City	128	32
	Rural areas	170	42

	Students	88	22
Occupation	Employed	104	26
	Unemployed	208	52
Total		400	100

We, inquired from participants do they know or have any knowledge about proper disposal of unused medicine regarding this 80 (20%) of the participants showed knowledge about proper disposal of unused medicine while 320 (80%) of the participants had shown no knowledge about proper disposal of unused medicine (Table 2).

Table 2. **Knowledge about proper disposal of unused medicine**.

Knowledge	**No: Of Participants**	**Percentage**
Yes	80	20
No	320	80
Total	400	100

To view how much participants were aware of harmful nature of medicines we asked from participants about effect of improperly thrown medicine on environment regarding this 28 (7%) of the participant said they don't know whether it effects or not .Whereas 176 (44%) said have no effect while 196(49%) believed have effect on environment (Table 3).

Table 3. Effect on environment.

Effect	**No: Of participants**	**Percentage**
Not sure	28	7
No	176	44

Yes	196	49
Total	400	100

The study participants were also asked whether disposing or throwing unused medicine into waste is correct or incorrect in their view.Regarding this 24 (6%) of the participant were not sure whether it was correct or incorrect. Whereas 185 (46.25%) viewed doing so was correct and 191 (47.75%) of the participants viewed doing so was incorrect (Table 4).

Table 4. Views for throwing UM into waste.

Throwing into waste	**No: of Participants**	**Percentage**
Don't know	24	6
Correct	185	46.25
Incorrect	191	47.75
Total	400	100

In this survey-based study we asked from participants about disposal practices of unused medicine where 60 (15%) of the participants disposed unused medicine into dustbin and 132 (33%) disposed outside of home and 208 (52%) of the participants disposed unused medicine into waste (Table 5).

Table 5. Disposal practices.

Disposal practices	**No: of Participants**	**Percentage**
Into dustbin	60	15
Outside of home	132	33

Into waste	208	52
Total	400	100

To know which class of unused medicines participants are having at home we asked from participants about names of unused medicines at home participants showed names, However instead of writing names we have arranged names of medicines into classes for clarity purpose, regarding this 23 (8.77%) had Antiprotozoal drugs and 36 (13.74%) had Antidiarrheal drugs and 41 (15.65%) had Antibiotic and 46 (17.56%) had Cough Medicine. Whereas 50 (19.09%) of the understudies had Analgesics and 66 (25.19%) had medicines such as antiemetic, antimalarials, antacid, antipyretic and multivitamins the names of these medicines were written below as 'others' to save the space (Table 6).

Table 6. Classes of unused Medicines.

Classes of medicines	**No. of participants**	**Percentage**
Antiprotozoal	23	8.77
Antidiarrheal	36	13.74
Antibiotic	41	15.65
Cough Medicine	46	17.56
Analgesics	50	19.09
Others	66	25.19
Total	262	100

Further we asked from participants about reasons why they did not completely use their medicines regarding this 112 (28%) of the participants didn't use due to laziness and 124 (31%) reasoned health not improved and 164 (41%) reasoned as health improved due to these reason they have not used their medicines.(Table 7).

Table 7. Reasons for not consuming medicines completely

Reasons	No: of Participant	Percentage
Due to laziness	112	28
Health not improved	124	31
Heath improved	164	41
Total	400	100

To see how many participants, have unused medicines at home, we asked from participants for having or not having unused medicines at home regarding this 138 (34.5%) of the participant said they have no unused medicine while 262 (65.5%) said have unused medicines (Table 8).

Table 8. Unused medicine at home.

Unused medicine at home	No of participants	Percentage
No	138	34.5
Yes	262	65.5
Total	400	100

The present study explored level of awareness for proper disposal of unused medicine in the vicinities of shaheed Benazir Abad Sindh Pakistan. In this study, the understudies ages were between 16 to 70 years with mean age 30 years details are shown in (Table 1).Regarding knowledge and level of awareness previous studies showed 85.8% of the participants had no knowledge about proper disposal of unused medicine [47] Similarly another study showed 75% of the understudies lacked knowledge about proper disposal of unused medicine [48]. The results of our study are similar with the above studies where 80% participants admitted have no knowledge about proper disposal of unused medicine while only 20% of the participant showed knowledge about proper disposal of unused medicine (Table 2) which is also consistent with above studies. This may be due to lack of government policies and lack of educational trainings and awareness campaigns because we saw countries such as Sweden where pharmaceutical companies and government conduct awareness campaigns, as a consequence populace has strikingly higher level of awareness 80% versus 20% of our study [49].

The perception about the effects of improperly disposed medicine on environment, cited by previous study was found 73% [15]. Similarly another study conducted in Kabul showed 98% of the participant had strikingly higher perception level [9].The results of our study showed very low level of perception about effect of unused medicine on environment as compared to above studies in our study only 49% of the participants believed improperly disposed medicine effect environment while 44% of the participants showed it has no effect on environment, even 7% had no idea whether improperly disposed medicine effect environment or not (Table 3). Many of the participants even viewed throwing unused medicine into waste is correct (Table 4). These findings indicate that participants are completely unaware of harmful nature of medicine and its everlasting effects.

For disposal practices of unused medicine previous studies showed 79.1% of the participants disposed unused medicines outside of home [50] In a similar study 53.84 % of the

participants disposed unused medicines into waste [51]The results of our study showed 52% of the participants disposed unused medicine into waste and 33% disposed outside of home only15% of the participants disposed into dustbins, yet participants had not expressed whether during disposal they had followed FDAs guidelines or not which is unclear (Table 5). The results of our study confirm the previous studies. However previous studies showed participants return unused medicine to pharmacies 23% , 42% respectively [49, 52]. Strangely none of our study participants retuned unused medicine to the pharmacies it implies whatever participants had unused medicine was disposed by improper means.

Regarding classes of unused medicine at home, previous studies found analgesics 35.9%, antibiotics 34.8% were found as unused medicines at home [43, 53-55]The results of our study showed that participants had unused medicine such as 19.09% analgesics, 15.65% antibiotics and 13.74% antidiarrheal (Table 6). which confirms the presence of various classes of unused medicines at home including antibiotics.

Studies in past have investigated finally why medicines are left unused, in this regard past studies showed reason behind a leftover unused medicine were such as nonadherence, improvement in health, [2, 42, 56]. Our results confirm the above studies (Table 7).

The results of our study showed that 65.5% of the participants have unused medicines at their homes. Regarding this previous study found 88%, of participants had unused medicines at home. Similarly, another study showed 78 % presence of unused medicines [57-59]. The results of our study are however lower than previous studies (Table 8).The presence of unused medicines at home pose danger to human and whole environment at large [9, 60].

Limitations.

Our study had some limitations firstly the study is cross-sectional analytical study which simply portray an existing problem it neither show cause nor can elucidate effects. This nature of the study makes it limited to relations only. But the important aspect of our study is that it has shown a large fraction of the participants have unused medicine which are improperly disposed and none of the participants were found returning unused medicine to the pharmacies which illustrates an startling situation in this regard dire measures are needed to be taken. Moreover, this study may serve as first ever study conducted at national level with a large sample size that can help and provide other researchers a solid framework to speculate more comprehensively. This study will also provide insights to health officials and policy makers in future.

Conclusion.

People lacked knowledge about likely side effects of disposing unused medicines improperly and storing them at home. Many participants not only improperly disposed but also accepted doing so was a suitable method. The FDA and WHO guideline are hardly known and seldomly practiced. It is suggested government should incorporate guidelines about the odds of improper disposal of unused medicines in curriculum at primary level of education this will help in to reduce the escalating problem.

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