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Healthcare professionals' perspective regarding the disposal of medicine: a cross-sectional study

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Abstract

Introduction: Improper disposal of unused and expired medicines may lead to many environmental and health problems. Healthcare professionals can guide people regarding disposal of medicine, but for that it is important to know their own perspective regarding this.

Aim: To assess the knowledge, attitude, and practices of doctors, nurses, and pharmacists on the disposal of unused and expired medicines.

Materials And Methods: A cross-sectional, questionnaire-based study was conducted at tertiary care hospital of Maharashtra. Healthcare professionals (doctors, nurses, and pharmacists) who were given a structured, pretested questionnaire containing 20 questions. A total of 292 questionnaires were collected and analysed.

Results: Analysing the methods to dispose of medicines, 61.30% throw in household garbage, 34.25% give to friends and relatives while 4.45% flush in a toilet or sink. 95.12% agreed that it is everyone's responsibility to dispose of medicine properly. 92.81% of participants felt that this study increased their awareness about the disposal of unused and expired medicines.

Conclusion: Though the attitude of health care professionals towards proper disposal of unused and expired medicines is positive, there is inadequate knowledge and improper practice of the same which need to be addressed.

Key Words: Drug resistance, Environmental harm, Expired medicine, Unused medicine.

Introduction

Medicines have proved to be a boon to human beings as these are used to prevent or treat many diseases [Nepal S, Giri A, and Bhandari R (2020)]. With the growing population; demand for medicine is increasing. To fulfil this demand there is a tremendous and constant increase in the pharmaceutical market and the use of medicinal products [Manocha S, Suranagi UD, and Sah RK. (2020)]. There are many reasons why people have unused or expired medicines at home such as cure of disease, change in dosage form, and occurrence of side effects [Seehusen DA, and Edwards J. (2006)]. Improper disposal of these medicines may cause environmental pollution which could be the cause of harm to humans and wildlife, drug resistance, and carcinogenetic products in the environment [Deshkar AT, Gawali UP, and Shirure PA. (2018)]. So, it is necessary to dispose of medicine properly. The general population needs to make aware of the proper disposal of medicine and to do this healthcare professionals (HCPs) need to come forward. Prior making policies and guidelines to educate the general public by HCPs, their own perspective toward the disposal of medicine needs to be analysed. There are very few studies in central India regarding HCPs perspectives on the disposal of medicines. So, this study was planned to assess the knowledge, attitude, and practices of doctors, nurses, and pharmacists on the disposal of medicines.

Materials and methods

This was an objective-type questionnaire-based, cross-sectional study, conducted among health care professionals of tertiary care centre in February 2024 to April 2024. Institutional Ethics Committee approval was taken. Doctors, nurses, and pharmacists working in this institute were included in the study. The purpose of the survey was explained to the participants. Assurance about the confidentiality of the information provided was also given. Written informed consent of the HCPs was sought from those who were willing to participate. Convenient sampling method was used, all the doctors, nurses, and pharmacist were included in study. HCPs who were not willing to participate were excluded from study. The printed copies of the pretested, validated, multiple-response self-administered questionnaire in English language that was prepared based on existing literature reviews were distributed to the HCPs. They were given a duration of 15 min to answer the questionnaires. There was a total of 10 questions to assess knowledge, 5 for attitude, and 5 for practices regarding the disposal of medicines. A total 400 questionnaires were distributed out of which 292 were considered for analysis. Microsoft Excel 2013 spreadsheet was used to enter the data and percentages were calculated for concerned responses.

Results

A total of 400 questionnaires were distributed, out of which 306 were collected as others refused to give back due to different reasons such as lost the questionnaire, lack of time, loose the interest. Out of 306 collected 292 were considered for analysis as other were incomplete. The response rate was 73%. Figure 1 and 2 shows the gender distribution and professional distribution of participants respectively. 63.45% participants were male while 36.55% were females. 64.73% participants were doctors, 31.16% were nurses and 4.11% were pharmacists.

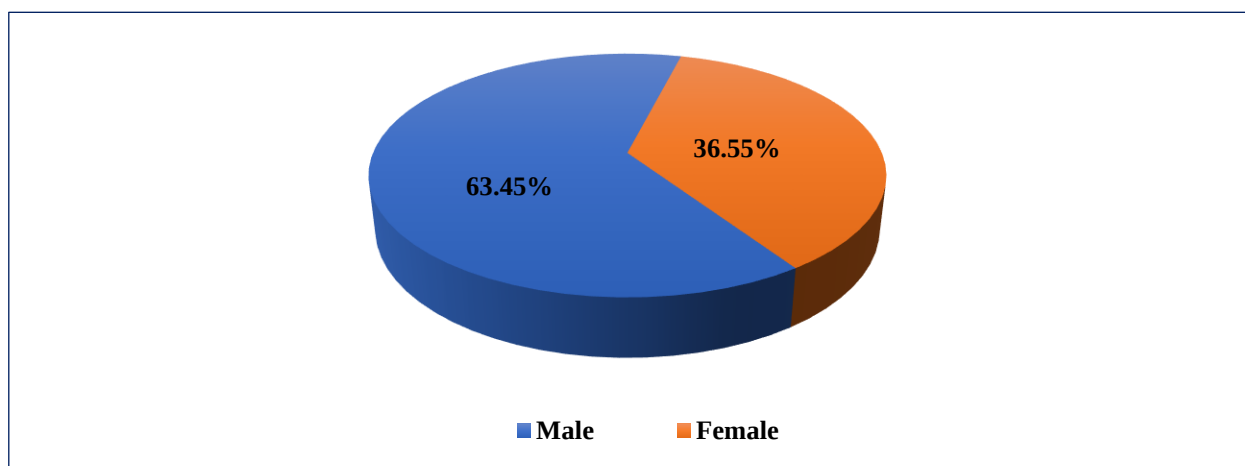


Figure 1: Gender distribution of participants.

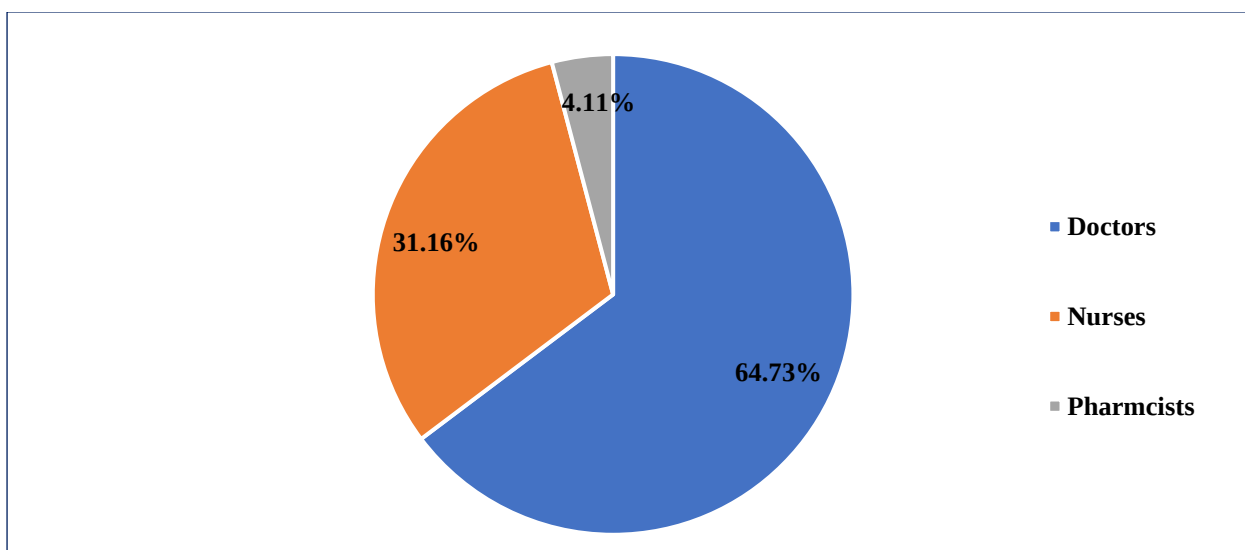


Figure 2: Distribution of participants according to the healthcare profession

Figures 3 and 4 show the percentage of responses to knowledge-based questions and attitude-based questions.

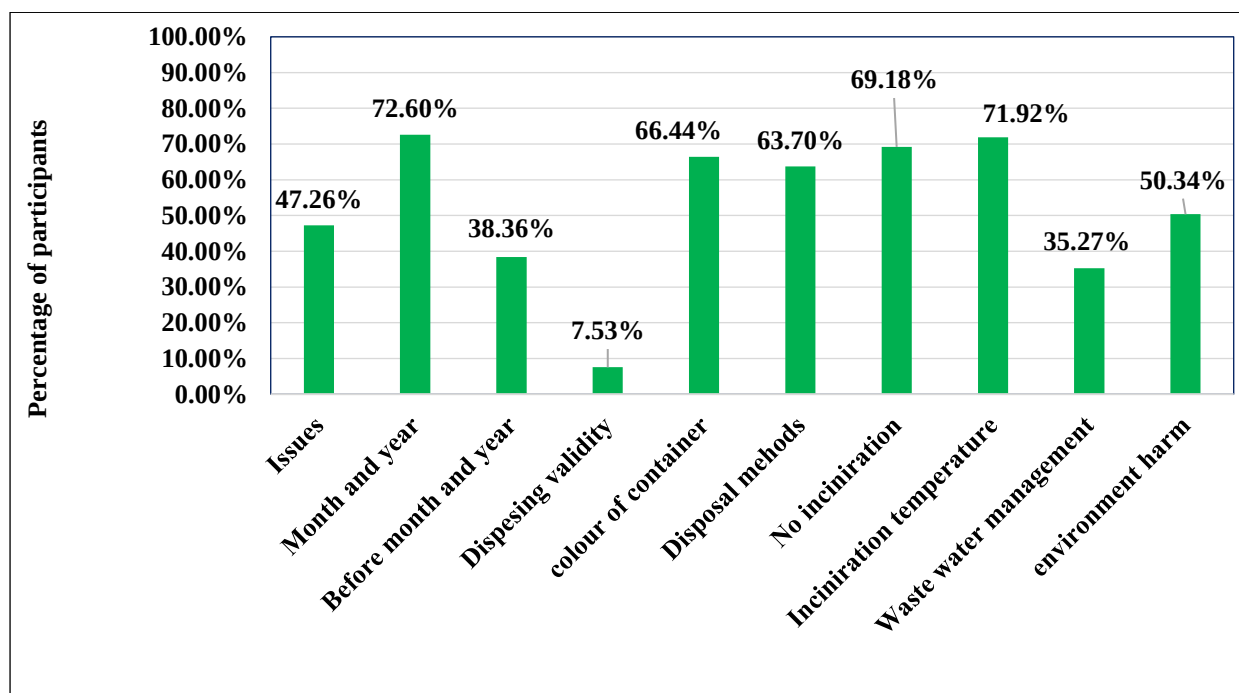


Figure 3: Responses of knowledge-based questions

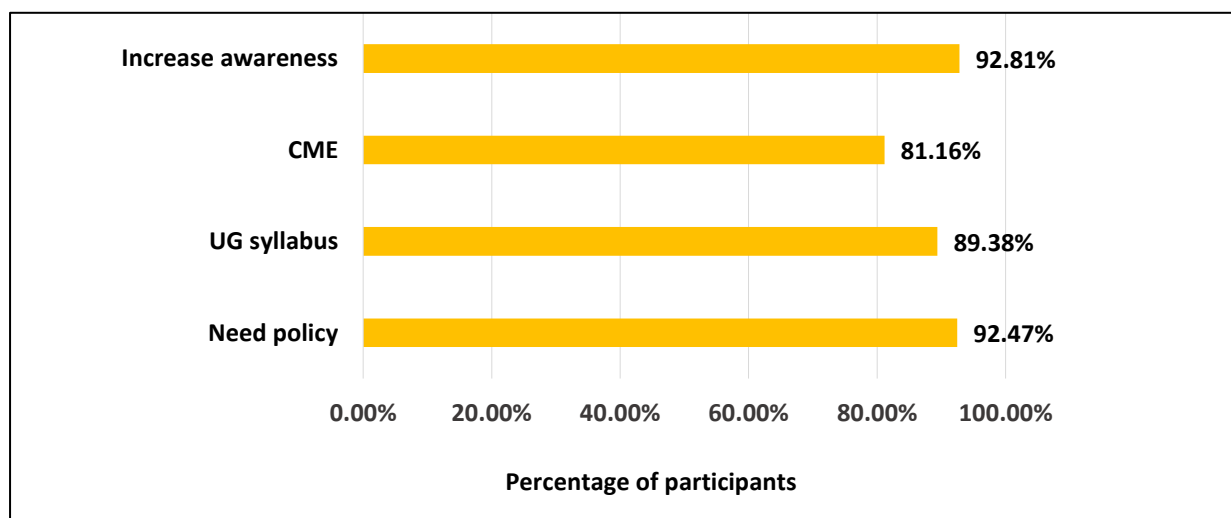


Figure 4: Responses of attitude-based questions

47.26% participants were aware about issues related to use of expired medicines. 72.60% participants were known that when only month and year is mentioned as expiry date; patient can use the medicine till the last day of that month. 38.36% participants knew the fact that when expiry date is mentioned as before month and year that means patient can use the medicine till the last date of previous month. 7.53% participants were known the validity until the expiry date, before which medicine should be dispensed. 66.44% participants reported correctly colour of container should be used to dispose medicines. 63.70% participants were aware about different methods of disposal of medicine. 69.18% and 71.92% participants had

knowledge of the type of formulations for which incineration for disposal is restricted and recommended incineration temperature respectively. 35.27% participants were aware that household waste water management is needed due to improper disposal of medicine. 50.34% participant were aware that improper disposal of medicines can harm environment.

92.81% participants agreed on that this study helped to increase their awareness regarding disposal of medicine. 81.16% participants mentioned that CME will be helpful to generate awareness. 89.38% participants thought that this topic should be included in under graduate syllabus. 92.47% participants thought that there should be proper policies for disposal of medicines.

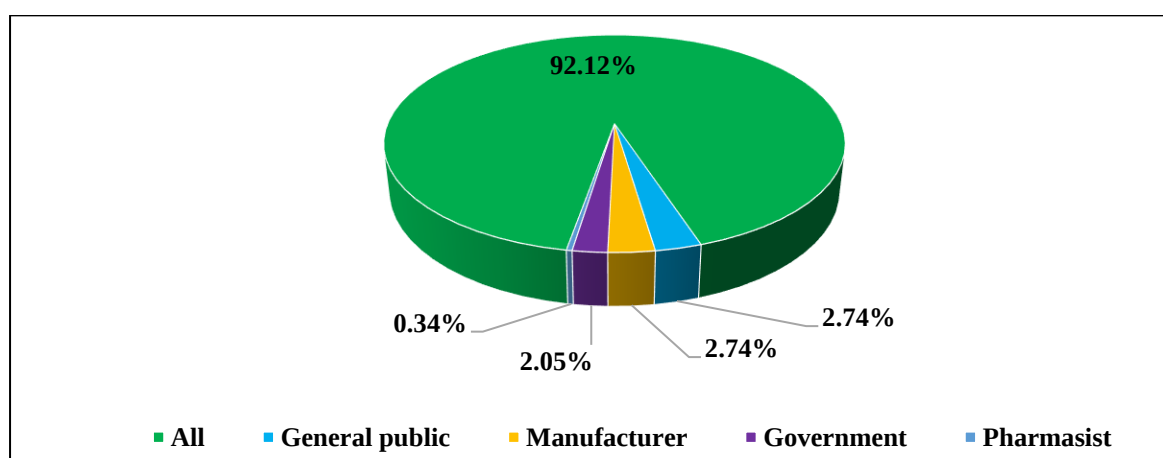


Figure 5: Responses responsibility of disposal of medicine

Figure 5 shows the responses to the attitude-based question mentioning the responsibility of disposal of medicines. 92.12% participants thought that it is a responsibility of all to do proper disposal of medicine.

93.15% participants store medicines at home. Figures 6, 7, 8, and 9 shows the responses of participants to practice-based questions. Figure 6 shows responses regarding checking expiry dates. 70.89% participants always check the expiry date before use of medicine while 5.14% participants rarely check it.

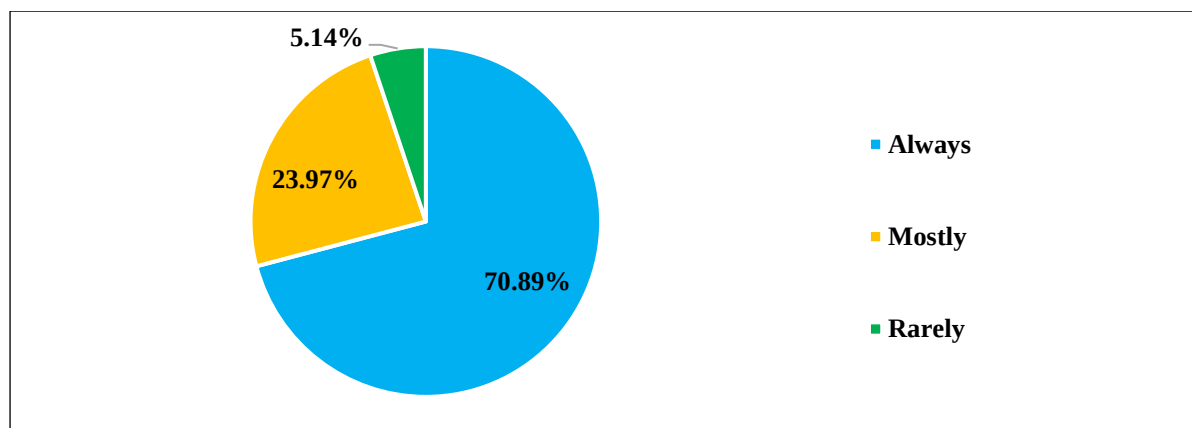


Figure 6: Percentage of participants who check the expiry date.

Figure 7 shows the responses regarding reasons of storage of medicines. 91.44% participants store medicine for future need. 1.71% participants store medicines because they don't want to waste it while 6.85% store as they don't know how to dispose.

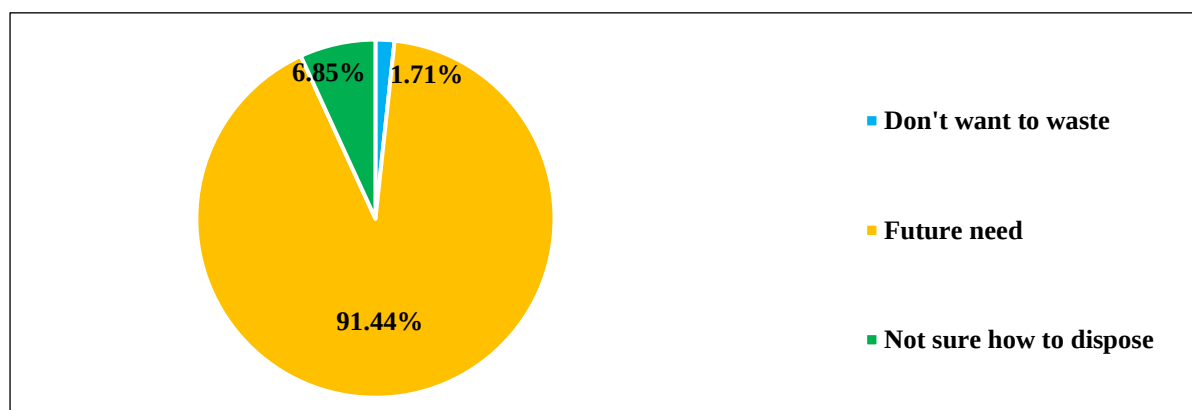


Figure 7: Responses to reason to store medicines

Figure 8 shows responses of disposal practices of participants. 61.30% participants throw medicines in garbage. 34.25% participants give to friends or relatives while 4.45% participants flush in toilets or sink

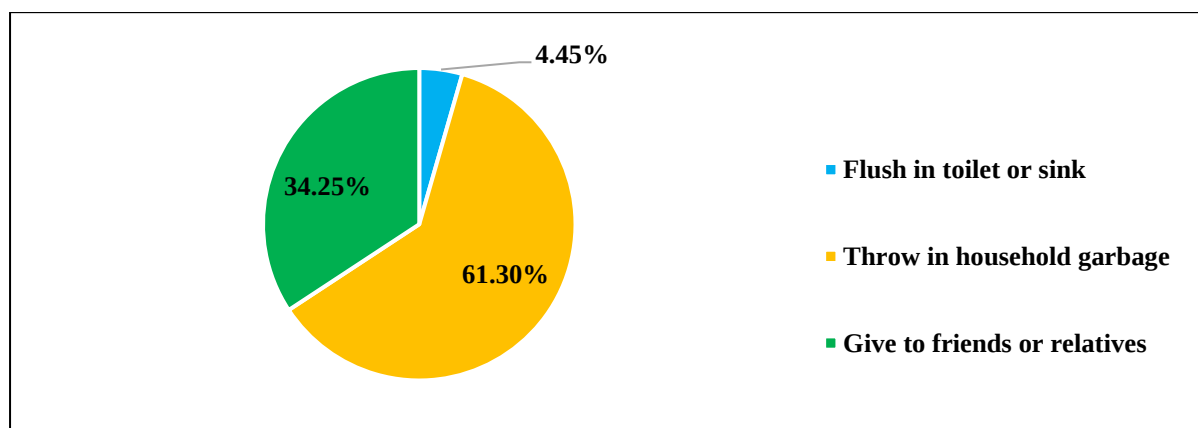


Figure 8: Responses to disposal practices of participants

Figure 9 represents the responses to the disposal advice practices. 6.16% participants mostly give advice regarding disposal of medicine to patients. 31.51% participants rarely while 62.33% participants never give advice to patients for proper disposal of medicines.

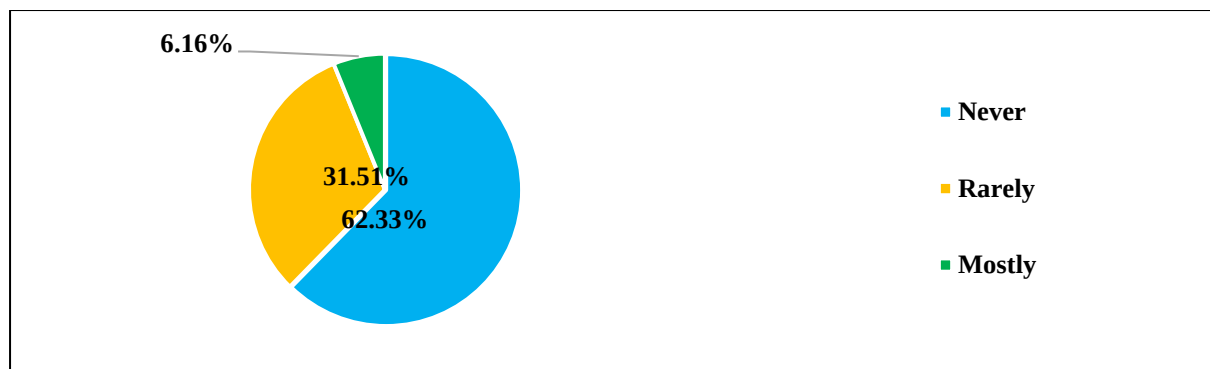


Figure 9: Responses to disposal advice practices

Discussion

With the increasing use of pharmaceutical products, there is an increase in its concentration in the environment. This leads to many problems like drug resistance, carcinogenicity, and treatment failure [Deshkar AT, Gawali UP, and Shirure PA. (2018)]. It is very important to create awareness in the general public regarding the disposal of medicines. But prior to that, it is important to analyse health care professionals' perspectives regarding the same. In the current study, 292 healthcare professionals' perspectives regarding the disposal of medicine were analysed. Doctors, nurses, and pharmacists were the participants. Maximum participants were male and doctors. Opare-Addo MNA (2022) in their study, took pharmacists and patients as participants while Jankie S (2022) took only patients as participants [Opare-Addo MNA, Marfo AFA, and Owusu-Daaku FT. (2022), Jankie S et al. (2022)]. In a study conducted by Raja S (2018), healthcare professionals were participants [Raja S et al., (2018)]. In this study, most of the participants were aware of the environmental harm caused by improper disposal of medicines. Participants were also known to different methods of medicine disposal, incineration temperature, and colour of the container where medicines are disposed according to waste management guidelines. In accordance to our results, Raja S (2018) and Umamageshwari A (2017) reported that the maximum number of participants were known to environmental harm by improper disposal of medicines [Raja S et al., (2018), Umamageshwari A et al., (2017)]. In a study conducted in north India, Bhayana (2016) reported that a maximum number of participants were well worse with the different issues faced due to improper disposal of medicines [Bhayana K, Rehan H, and Arora T. (2016)]. In the present study, 92.47% of

participants felt the need of a policy for the disposal of medicine. In accordance to our study, Raja S (2018) and Swaroop HS (2015) reported the same finding [Raja S et al., (2018), Swaroop HS, Chakraborty A, and Virupakshaiah A. (2015)]. In this study, the majority of participants agreed on the need of continuous medical education, and the inclusion of this topic in the undergraduate syllabus for better awareness. In the present study, 70.89% of participants check the expiry date before use. Raja S (2018), Uma mageshwari A (2017), and Bhayana (2016) reported the same results in their studies [Raja S et al., (2018), Umamageshwari A et al., (2017), Bhayana K, Rehan H, and Arora T. (2016)]. In the current study future need is the most common (91.44%) cause of storage of medicine. In this study, the majority (62.33%) of participants throw medicines in garbage bags. This result is in accordance with Raja S (2018), Uma Mageshwari A (2017), Bhayana (2016), and Swaroop HS (2015) studies conducted in different places of the world in different populations [Raja S et al., (2018), Umamageshwari A et al., (2017), Bhayana K, Rehan H, and Arora T. (2016), and Swaroop HS, Chakraborty A, and Virupakshaiah A. (2015)]. 62.33% of participants of the present study gave suitable instruction to patients about the disposal of medicine. In the current study knowledge of participants was inadequate and with improper practices of disposal of medicines. As the attitude of participants is positive awareness in participants can be awakened by continuous medical education, social media sensitization, and conferences. This may also improve their practices regarding the same. This study was single-centre and with a small sample size. To generalize the results multi-centre study with a large sample size should be conducted.

Conclusion

Despite positive attitudes regarding the disposal of medicines in health care professionals, there is inadequate knowledge and improper practices regarding the same which need to be addressed. The training program, continued medical education, workshop, and medicine take-back program may help to advise and motivate proper and safe disposal of medicines to safeguard the environment and mankind.

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