

KNOWLEDGE, ATTITUDE, AND PRACTICES ON BIOMEDICAL WASTE MANAGEMENT AMONG MEDICAL INTERNS OF A TERTIARY CARE HOSPITAL IN NORTH KARNATAKA

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ABSTRACT

Objective: Every health-care personnel is expected to have adequate knowledge, good attitude, safe practice, and capacity to guide others for appropriate biomedical waste (BMW) collection and management. The study aims to assess the knowledge, attitude and practices regarding BMW management among the budding yet responsible doctors- the medical interns in ESIC Medical College and Hospital, Gulbarga.

Methods: A cross-sectional study was conducted among all the 81 interns currently posted in ESIC Medical College and Hospital, Gulbarga. Data were collected using pre-designed and semi-structured questionnaire to assess the knowledge, attitude, and practices on BMW management.

Results: The study found that a majority (69.1%) of interns demonstrated fair knowledge regarding BMW management. Majority (93.8–98.8%) of the interns showed a positive attitude towards BMW segregation, self-responsibility, observation of charts at workplace, and training on BMW management. Furthermore, only 12.3% interns viewed BMW management as an extra burden on work. However, only 44.4% of interns were pre-treating liquid waste, and 50.6% were using a needle hub cutter. Alarming, 23.3% indicated that they would not report injuries.

Conclusion: BMW management practices can be further improved with strict supervision and incorporation of BMW management in the assessment of internship completion in addition to periodic training.

Keywords: Biomedical waste, Color coding, Knowledge, Interns.

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INTRODUCTION

“Bio-medical waste (BMW)” means any waste, which is generated during the diagnosis, treatment or immunization of human-beings or animals, or in research activities pertaining thereto or in the production or testing of biological [1]. The swift progresses in modern medicine increased generation of BMW in every health-care facility [2]. Out of all the waste generated in a health-care facility, 10–15% are considered BMW which is hazardous and can cause potential health problems like hepatitis B, C, and HIV/AIDS [1].

To reduce the risk of the health problems, appropriate management of BMW is necessary which can protect the patients, health workers and the general public from hazardous effects of BMW [2].

Although India is one among the first countries to launch safe disposal measures for BMW, Central Pollution Control Board (CPCB) report showed a gap between BMW health-care and its appropriate handling [3]. This calls for urgent bracing of existing system through training and supportive supervision activities among the health-care providers towards safe disposal of BMW to tackle the increased load [4].

Health workers are one among the pillars of BMW management [5]. Medical interns being beginners in the health-care delivery system may be at high risk of various hazards from improper BMW management practices. Since they are budding yet responsible doctors, they should be having adequate knowledge, positive attitude, safe practice, and capacity to guide others for appropriate implementation of BMW management. Hence, this study was an effort to assess knowledge, attitude, and practices regarding BMW management among the medical interns.

METHODS

It was a cross-sectional study conducted among the medical interns of ESIC Medical College, Gulbarga, Karnataka, from March 2023 to

May 2023. Institutional Ethical Committee approval was sought and was granted. All the medical interns were invited to take part in the study and anonymity as well as confidentiality was assured. Those who were on leave or otherwise unavailable were included after repeated attempts. Hence, all the 81 interns were included in the study after obtaining their informed consent. Data were collected using a pre-designed and semi-structured questionnaire on the demographic profile and the knowledge, attitude, and practices of the interns regarding collection, segregation and management of BMW.

A score of 1 was awarded for the correct answer to each of the 12 questions in the knowledge domain and the participants scoring >9 out of 12, that is, >75% of total score were considered to have good knowledge, similarly 6–8 out of 12, that is, 50–75% of total score were considered to have fair knowledge and <6 out of 12, that is, <50% of total score were considered to have poor knowledge [6].

The response to each of the five questions in the attitude domain was assessed to be whether positive or negative attitude.

The response to each of the four questions in the practice domain was assessed to be whether good or poor practice.

The questionnaire was circulated among the interns as Google forms. The collected data were entered into MS Excel and descriptive analysis in terms of frequency and percentage was done.

RESULTS

A total of 81 interns who were currently posted in the institute were included in the study. The majority (60.5%) of the study participants were female. Most (93.8%) of the study participants had attended the BMW management training conducted by the institute. All the study participants belonged to the age group 22–25 years.

Table 1: Knowledge of participants on BMW management (n=81)

Sl. No.	Questions to assess knowledge on BMW management	Correct answer (n=81) (%)	Incorrect answer (n=81) (%)
Regarding basics of BMW management			
1.	From where should the permission be taken to do Biomedical waste management in your institute?	24 (29.6)	57 (70.4)
2.	What do CPCB stand for?	35 (43.2)	46 (56.8)
3.	What are the colour coded bins to be used according to Biomedical waste management rules, 2016?	35 (43.2)	46 (56.8)
4.	Are all healthcare wastes hazardous?	48 (59.3)	33 (40.7)
5.	Which of the following is the symbol of Biohazard?	63 (77.8)	18 (22.2)
Colour coding			
6.	Which of the following should go to blue bag/container?	33 (40.7)	48 (59.3)
7.	To which colour coded bag/container should discarded medicines go?	38 (46.9)	43 (53.1)
8.	Which of the following should go to white translucent container?	49 (60.5)	32 (39.5)
9.	To which colour coded bag/container should urine bags go?	60 (74.1)	21 (25.9)
10.	To which color coded bag/container should discarded blood bag go?	61 (75.3)	20 (24.7)
11.	All the following should go to red bag/container except	66 (81.5)	15 (18.5)
12.	All the following should go to yellow bag/container except	68 (84)	13 (16)

BMW: Biomedical waste, CPCB: Central pollution control board

Table 2: Attitude of participants on BMW management (n=81)

Sl. No.	Components	Positive attitude (n=81) (%)	Negative attitude (n=81) (%)
1.	Training	80 (98.8)	1 (1.2)
2.	Self-responsibility	79 (97.5)	2 (2.5)
3.	Display of charts near the bins	77 (95.1)	4 (4.9)
4.	Segregation at source	76 (93.8)	5 (6.2)
5.	Burden on work	71 (87.7)	10 (12.3)

BMW: Biomedical waste

Table 3: Practices of participants on BMW management (n=81)

Sl. No.	Components	Good practice (n=81) (%)	Poor practice (n=81) (%)
1.	Pre-treatment of liquid waste	36 (44.4)	45 (55.6)
2.	Use of needle hub cutter	41 (50.6)	40 (49.4)
3.	Segregation at source	51 (62.96)	30 (37.04)
4.	Reporting of needle prick injury	62 (76.7)	19 (23.3)

BMW: Biomedical waste

Fig. 1 shows grading of the knowledge of study participants on BMW management. It was found that the majority had fair knowledge (69.1%), followed by 16.1% having poor knowledge and 14.8% having good knowledge.

Table 1 illustrates the knowledge of study participants on BMW management. Knowledge regarding basics of BMW management was low with respect to expansion of CPCB and all types of color coding used for BMW management (43.3% each) and permitting authority for BMW management in the institute (29.6%). However, majority (77.8%) correctly identified the symbol for biohazard and 59.4% knew that all health-care waste were not hazardous. Correspondingly, 84%, 81.5%, and 40.7% correctly identified type of BMW collected in yellow, red, and blue container, respectively, and also, 75.3%, 74.1%, and 46.7% identified the correct container for blood bag, urine bag, and discarded medicines, respectively.

Table 2 depicts attitude of study participants toward BMW management, where majority, that is, 98.8% supported training, 97.5% assumed self-responsibility for BMW management, 95.1% were willing to observe the charts displayed near the bins in case of doubt, 93.8% supported segregation at source but a minority of 12.3% felt BMW management as an extra burden on work.

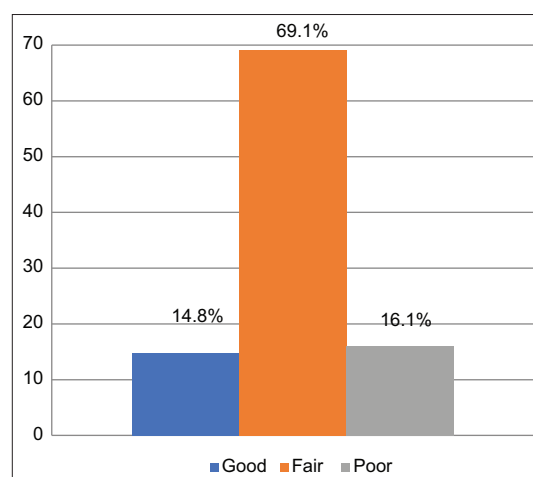
**Fig. 1: Grading of knowledge of participants on biomedical waste management (n=81)**

Table 3 shows practices of study participants regarding BMW management. Majority (62.96%) study participants segregated BMW at source. However, only 50.6% were using needle hub cutter, 44.4% were pre-treating liquid waste and 23.3% indicated that they would not report injuries.

DISCUSSION

Medical interns, who have just begun their career, are the most inexperienced cadre of healthcare workers in a tertiary care teaching hospital. Hence, poor knowledge, negative attitude, and poor practice of BMW management among them can prove dangerous for their own health, their patients, other staff and also others in the environment [7].

In the present study, majority of the participants (60.5%) were females, almost similar to 51–55% females in the studies done by Priya and Dixit, Kumar [2,8].

In the present study, majority of interns (93.8%) attended training on BMW management in our hospital, compared to only 22% having attended training in a study conducted by Kumar [8]. This could be due to mandatory BMW management training, integrated with the Internship Orientation Program for fresh medical interns in our institute.

In our study, 14.8% of the participants had good knowledge compared to only 4% having excellent knowledge in a study done by Srivastava *et al.* [6]

In the present study, around 98.8% and 76.7% of the participants had positive attitude toward training in BMW management and reporting of injuries, respectively, which is higher than the findings of the study done by Veeresh and Salelkar [9] where only 70% had positive attitude toward training and only 49% reported injuries.

In our study, it was found that most of the participants (93.8%) had positive attitude toward segregation of BMW at source and 62.96% practiced the same in comparison to 60% having positive attitude and 50% practicing segregation of BMW at source in the study by Veeresh and Salelkar [9] This indicates positive attitude lead to increase in practice. However, the practice of our study participants was comparatively lesser than that found in the studies conducted by Pandey and Dardi [10], Shah and Mulla [11] i.e. 78.4–80%.

In the present study, among the study participants, 97.5% assumed self-responsibility for BMW management while 87.7% did not find it as an additional burden on work and 44.4% practiced pre-treatment of the liquid waste, in comparison to the results of the studies done by Pandey and Dardi, Shah and Mulla [10,11] which was 60–94%, 90%, and 54.3–88.2%, respectively.

Overall, we found that our interns had fair knowledge and positive attitude, towards BMW management. Though they are practicing better than their counterparts in other studies, still entails improvement.

CONCLUSION

Majority of the interns have attended pre-internship training and are having fair knowledge and positive attitude regarding BMW management. BMW management practices can be further improved with strict supervision and incorporation of BMW management in the assessment of internship completion in addition to periodic training.

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