



Original Research Article

Pre and post training study of awareness about biomedical waste management among health care personnel in medical college hospital in Western Rajasthan

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ABSTRACT

Introduction: The biomedical waste is any waste that is generated during diagnosis, treatment or immunization of human beings or animals, or in the research activities of biological. The amount of biomedical waste being generated is increasing day by day which can pollute the environment and can spread many harmful diseases if not handled properly. Health care workers in our country are still not fully aware about proper disposal of BMW.

Aims and Objective: The objective of the study was to assess the effect of training on health care personnel about the biomedical waste management in our institution.

Materials and Methods: A pre designed questionnaire was used for data collection before and after hands on training. Total 250 health care personnel including doctors, nurses, lab technicians and class IV employees working in our institution participated in study. Data was analysed using SPSS software and results were interpreted into percentages.

Results: Doctors, nurses and lab technicians had good knowledge regarding biomedical waste management before but the knowledge of class IV employees (cleaners and maintenance personnel) was not good but all group showed good improvement in their Knowledge regarding biomedical waste management after training.

Conclusions: There should be periodic trainings and workshops with special focus on proper use of personal protective measures for all health personnel having special focus on paramedical and cleaner staff about Biomedical waste management rules.

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1. Introduction

The term “biomedical waste” has been defined as “any waste that is generated during diagnosis, treatment or immunisation of human beings or animals, or in the research activities pertaining to or in the production or testing of biological and includes categories mentioned in schedule I of the Government of India’s Biomedical Waste (Management and Handling) Rules 1998”¹ With the increasing health care facilities and increased generation of biomedical waste, its proper management has become a burning issue. Biomedical waste if not managed properly

can spread highly contagious diseases and damage the environment.²

The average waste generation rates of 0.5 kg to 2 kg per bed per day and it is estimated that annually about 0.33 million tons of hospital waste is generated in India in this, 10-25% of the healthcare waste generated is hazardous & causes serious health problems.³

Inadequate biomedical waste management not only poses significant risk of infection due to pathogens like HIV, Hepatitis B & C virus but also carries the risk of water, air & soil pollution thereby adversely affecting the environment and community at large.⁴

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Improper management of biomedical waste poses a serious threat to human health and may lead to various health hazards like transmission of diseases, not only to health workers, but also to patients and their attendants visiting the health centres.

Therefore, the Ministry of Environment and Forests has promulgated the Bio-Medical Waste (Management and Handling) Rules, 1998 for proper management of Bio-Medical waste.⁵

The purpose of BMW management is to ensure its proper collection, handling, as well as safe disposal. Health care personnel are expected to have knowledge regarding proper segregation and disposal of BMW. Due to improper biomedical waste management and lack of awareness and inadequate knowledge, health centres now a days are becoming a hub for spreading infections, therefore this present study was done.

2. Materials and Methods

This was an observational, descriptive, hospital based, cross sectional study which was conducted in our institution in the month of March, April and May 2020. Ethical clearance was taken from Institute Ethics Committee. The study group comprised of healthcare personnel that were doctors, nurses, laboratory technicians and Class IV employees after taking their consent. Participants who didn't give consent to participate were excluded from the study. A predesigned questionnaire having 20 questions was designed to obtain information about awareness and knowledge of BM waste generation and waste management practices. These questions were about biomedical waste generation, proper segregation, transportation, disposal, treatment, health hazards and legislation, waste management practices, attitude assessment and sharp waste injuries. The answers were checked and marks were given and this data was compiled and analysed into a work sheet on Microsoft excel sheet using software SPSS 20 version. Proportions and percentage were used to interpret the result

3. Results and interpretation

A total of 250 participants (50 doctors, 140 nurses, 30 lab technicians and 30 class IV employees) took part in the study. Table 1 shows pre and post training knowledge of various health personnel regarding BMW management. Improvement in Knowledge and awareness, post training about bio medical waste handling and management is also presented in bar diagram's in Figure 1,2,3,4 of doctors, nurses, lab technicians and class IV employees respectively. The questions were, whether they heard of BMW, details about categories of BMW, awareness of bio hazard symbol, any health hazard of BMW, disease transmitted by BMW, knowledge about color coding of BMW management bags, received any training for BMW, and aware about waste

management team, etc .

The overall, Improvement in knowledge was satisfactory and was highest among doctors (60-70%) before training and (90-100 %) after training, followed by nurses (50-60%) before training and (80-90 %) after training ; lab technicians (30-40%) before training and (75-85 %) after training; class IV employees (20-30%) before training and (60-70 %) after training .

Knowledge regarding pre-treatment of highly infectious waste, use of personal protective measures for handling, spill management, management of liquid bio medical waste, proper storage facility for collecting BMW, bar coding of BMW, previously attended training on BMW was not enough among all the categories.

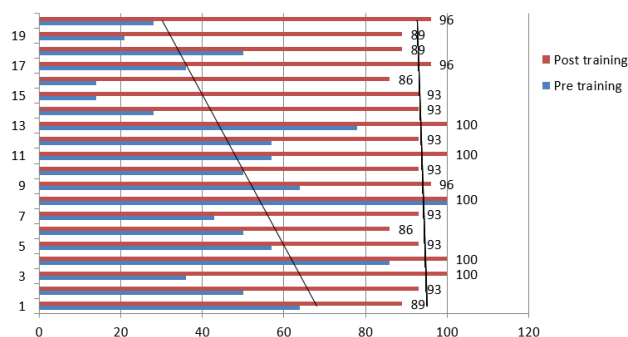


Fig. 1: Awareness among Doctors about Bio medical waste management before and after training

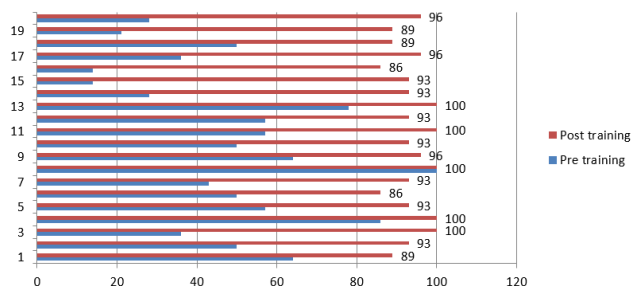


Fig. 2: Awareness among Nurses about Bio medical waste management before and after training

4. Discussions

Most of the Doctors had satisfactory knowledge (60-70%) about BMW management. This can be credited to the due their regular dealing with BMW and may be due to the topic in the MBBS curriculum. The knowledge of nursing staff was appreciable and similar reasons can be attributed to this (50-60%). Unfortunately, only 30-40% lab technicians as well as 20-30% class IV employees had proper knowledge. The results were similar to results of Verma et al.⁶

Table 1: Distribution of health care personnel onawerness regarding bio-medical waste management. (N=250)

	Doctor(n=50)		Nurses(n=140)		Lab technician(n=30)		Class 4 employees (n= 30)	
	Pre training	Post training	Pre training	Post training	Pre training	Post training	Pre training	Post training
1.Primary source of BMW	35 (70)	48 (96)	90 (64)	125 (89)	10 (33)	25 (83)	5 (16)	20 (67)
2.BMW management rules	30 (60)	50 (100)	70 (50)	130 (93)	5 (16)	25 (83)	2 (6)	20 (67)
3.Knowledge of different BMW categories 2016	30 (60)	50 (100)	50 (36)	140 (100)	10 (33)	28 (93)	0 (0)	20 (67)
4.Colour coding of containers	40 (80)	50 (100)	120 (86)	140 (100)	10 (33)	28 (93)	6 (20)	25 (83)
5.Segregation of biomedical waste at source	35 (70)	50 (100)	80 (57)	130 (93)	8 (27)	25 (83)	6 (20)	22 (73)
6.BMW disposal	30 (60)	45 (90)	70 (50)	120 (86)	5 (16)	23 (76)	7 (27)	20 (67)
7.BMW Storage	25 (50)	45 (90)	60 (43)	130 (93)	7 (23)	26 (86)	8 (27)	20 (67)
8.Biohazard symbol	50 (100)	50 (100)	140 (100)	140 (100)	25 (83)	30 (100)	8 (27)	28 (93)
9.Universal precautions	40 (80)	48 (96)	90 (64.2)	135 (96)	20 (67)	25 (83)	10 (33)	24 (80)
10.Diseases transmitted by BMW	40 (80)	50 (100)	70 (50)	130 (93)	15 (50)	29 (96)	0 (0)	20 (67)
11.Hepatitis b vaccination status	45 (90)	50 (100)	80 (57)	140 (100)	18 (60)	30 (100)	4 (13)	22 (73)
12.Sharp waste disposal	35 (70)	48 (96)	80 (57)	130 (93)	20 (67)	30 (100)	6 (20)	25 (83)
13. BMW management is a team work	40 (80)	50 (100)	110 (78)	140 (100)	15 (50)	30 (100)	5 (16)	23 (76)
14.Bar coding/ labeling of BMW	30 (60)	50 (100)	40 (28)	130 (93)	5 (16)	25 (83)	2 (6)	24 (80)
15. Pre treatment of highly infectious waste	25 (50)	40 (80)	20 (14)	130 (93)	4 (13)	26 (86)	0 (0)	20 (67)
16.Liquid bio medical waste management	25 (50)	45 (90)	20 (14)	120 (86)	6 (20)	26 (86)	2 (6)	15 (50)
17. Safe method of transportation	38 (76)	45 (90)	50 (36)	135 (96)	12 (40)	22 (73)	8 (27)	26 (86)
18. Use of PPE while handling BMW	45 (90)	50 (100)	70 (50)	125 (89)	10 (33)	24 (80)	7 (23)	26 (86)
19.Treatment of BMW	30 (60)	48 (96)	30 (21)	125 (89)	6 (20)	26 (86)	2 (6)	22 (73)
20.Spill management	30 (60)	48 (96)	40 (28)	135 (96)	12 (40)	26 (86)	0 (0)	20 (67)

The present study findings are in agreement with other study Yadavannavar et al.⁷ and study done by Bala et al.⁸ This study showed poor knowledge among lab technicians and class IV employees may be due to, most of them are on contract basis and were not as much as fortunate to get repeated training compared to doctors and nursing staff. Though overall knowledge of study participants was good after training but there is still a need of regular good quality training to improve their current knowledge about BMW and especially main emphasis should be focused on training of lab technicians and sanitary workers at regular

time interval also discussed in study done by Mathur et al⁸ and Kishore et al.⁹ Anand P et al.¹⁰

Practical knowledge regarding pre-treatment of highly infectious waste, use of personal protective measures for handling, spill management, management of liquid bio medical waste, proper storage facility for collecting BMW, bar coding of BMW was not enough among all the categories as these aspects are recently introduced in practices.

It can be well judged from the results that practice score of BMWM was mostly satisfactory in doctors (80%), nursing staff (70%) but not among lab technician (50%) and

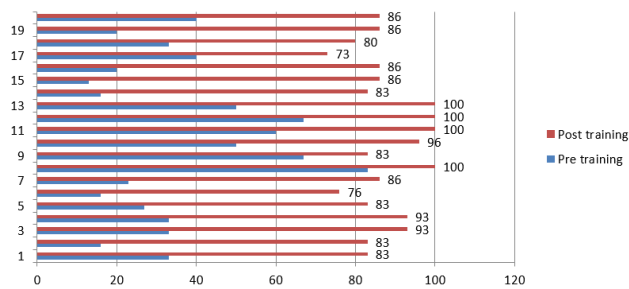


Fig. 3: Awareness among Lab Technicians about Bio medical waste management before and after training

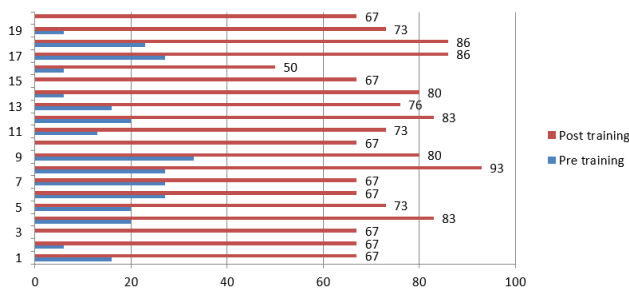


Fig. 4: Awareness among class IV employees about Bio medical waste management before and after training

class IV employees (30%), Similar results were seen in the study of Sachan et al.,² and Bhatt et al.¹¹

Knowledge regarding BMW management among doctors, nurses and lab technicians was found to be satisfactory as compared to class IV employees, also reported in previous studies.^{12–16} This low standard of knowledge regarding BMW management among class IV employees may be due to the lack of any formal training to them due to contract type of services.

5. Conclusion

The study showed good awareness among doctors, nursing staff but poor in lab technician and sanitary workers before training. Based on the observation, the importance of training regarding bio medical waste management can't be overemphasized as there is very good improvement in knowledge and awareness after training so induction training of newer health care personnel and continuous in-service training programs and periodically evolution of the health care personnel is required.

6. Source of Funding

None.

7. Conflict of Interest

None.

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