



Original Research Article

Clinical audit: Awareness of bio medical waste (BMW) management among OT personnel

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ABSTRACT

Introduction: Inappropriate handling of biomedical waste carries a higher potential for infection and injury than any other type of waste. Its effective management is a social as well as legal responsibility.

Materials and Methods: To assess the knowledge and practice regarding biomedical waste management among the OT personnel in a tertiary care hospital based in New Delhi, an audit was conducted using a questionnaire with 230 participants who are largely responsible for segregation of biomedical waste generated at point source in the operation theatre. It included 11, 42, and 72, third year, second year and 1st year anaesthesia post graduate students respectively, 53 anaesthesia senior residents, 24 nursing staff and 28 OT technicians.

Results: Although 85.2% of the subjects got formal training for proper biomedical waste disposal, the knowledge among them was found unsatisfactory. More than 40% of the participants in each group barring OT technicians didn't know proper segregation of waste.

Conclusion: The audit showed poor knowledge of proper biomedical waste disposal among OT personnel in a tertiary care hospital in New Delhi. There is a need of strict supervision and implementation of the recommended guidelines to ensure a safe environment.

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1. Introduction

Healthcare activities restore health and save lives, however, during the process, inevitably generate hazardous biomedical waste. 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 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

World Health Organization states that only 15% of hospital wastes are actually hazardous among which 10% are infectious and 5% are non-infectious.² Improper disposal of the biomedical waste poses a serious threat to the environment and human health. The waste produced in the course of healthcare activities carries a higher potential

for infection and injury than any other type of waste.

Hospital-acquired infections have been estimated at 10% of all fatal/life-threatening diseases in the South-East Asia region and have been identified as one of the indicators for the management of waste.³

The Environment Protection Act 1986, the Bio Medical Waste (Management and Handling) Rules in July 1998, subsequently revised in 2011 and now the Bio Medical Waste Management Rules, 2016 are an attestation to the commitment of Government of India.

Despite increased global awareness about biomedical waste management among health care professional, the level of awareness in India has been found to be not satisfactory.⁴⁻⁶

Thus, the present audit was conducted with the aim to assess the level of awareness of biomedical waste management among OT personnel in a tertiary care hospital.

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2. Materials and Methods

The audit was done at Vardhaman Mahavir Medical College & Safdarjung Hospital, a tertiary care hospital in South Delhi using a questionnaire with closed-ended questions given to a total of 230 OT personnel. The study population included 53 senior residents, 72 1st year post graduate students, 42 2nd year post graduate students, 11 3rd year post graduate students, 28 OT technicians and 24 nurses who work in the OT complex.

The questionnaire consisted of 16 questions and was designed to obtain information about formal training, knowledge and practice of biomedical waste management among health care personnel. Confidentiality of the participants was maintained.

Data collected was compiled and analysed manually. Percentage and proportion were applied to interpret the result.

3. Results

Out of the total 230 health care personnel who participated in the audit, 31.3% were PG 1st year, 18.2% were PG 2nd year, 4.7% were PG 3rd year, 23% were senior residents, 12.1% were OT technicians and 10.4% were nurses working in the OT complex (Figure 1).

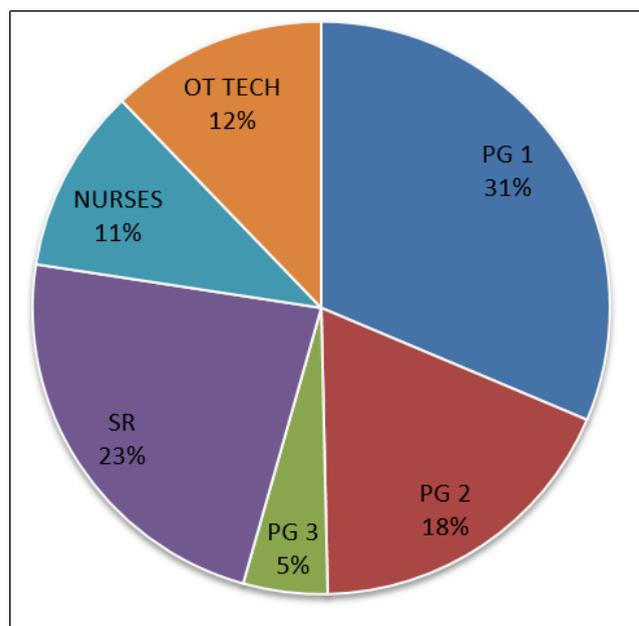


Fig. 1: Distribution of health care personnel surveyed

2% of the subjects had formal training on biomedical waste management (Figure 2)

Table 1 reveals the level of knowledge of biomedical waste management, hazards and legislation among health care personnel. Only 25% of the nurses and 21.4% of OT technicians had excellent knowledge, whereas most of the

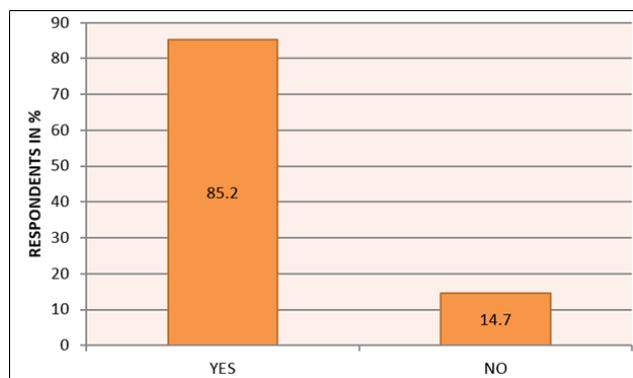


Fig. 2: Undergone training

subjects had good to average knowledge. 18.1% of PG 3 and 14.2% of PG 2 had unsatisfactory knowledge about the biomedical waste disposal.

Segregation is the most important step for the OT personnel in biomedical waste management chain. So, we inquired about the basis of segregation. 61% of PG-1, 71% of PG-2, 63.6% of PG-3, 73.5% of SR, 75% of Nurses and 60.7% of OT Technicians were correct about the basis.

Figure 3 shows the percentage of OT personnel in each category who gave incorrect answers for questions pertaining to colour coding. One or both incorrect answer out of the 2 questions asked was considered as incorrect.

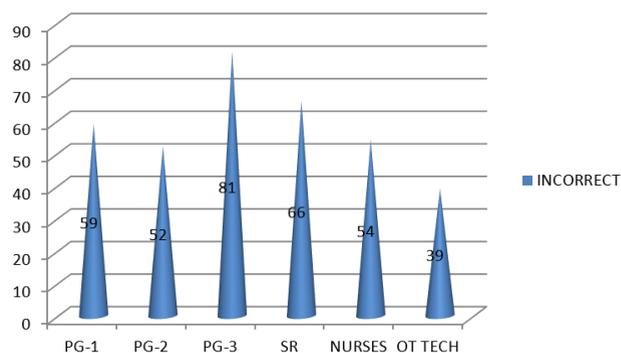


Fig. 3: Incorrect for colour coding

173 respondents knew correct method of needle disposal but only 140 among them always destroyed the needles after use either by cutter, shredder or by mutilation (Figure 3).

119 subjects knew the correct method of gloves disposal after use but only 90 among them always disposed off correctly. (Figure 4)

Only 20.4% of the respondents knew the correct maximum time limit of keeping the biomedical waste around hospital premises.

Table 1:

| Health Care Personnel | Scoring Criteria (%) | | |
|-----------------------|----------------------|-------------|------|
| | Excellent | Good to avg | Poor |
| SR | 7.5 | 88.6 | 3.7 |
| PG 3 | 0 | 81.8 | 18.1 |
| PG 2 | 0 | 85.7 | 14.2 |
| PG 1 | 8.3 | 81.9 | 9.7 |
| Nurses | 25 | 75 | 0 |
| OT Tech | 21.4 | 78.5 | 0 |

Excellent: 11-15 Score out of 15

Poor: <6 Score out of 15

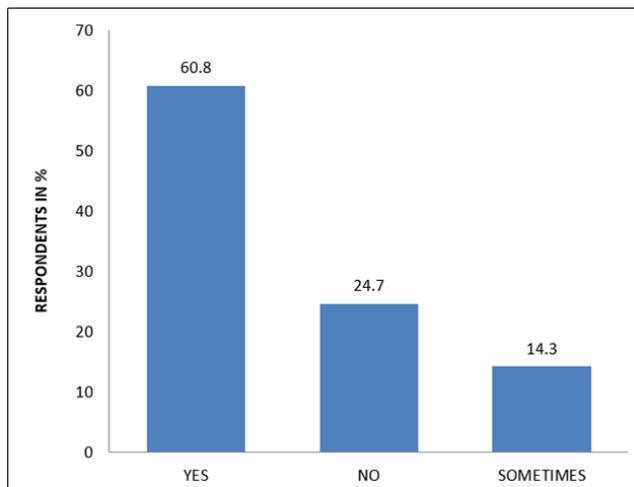


Fig. 4: Burn/cut needle TIP

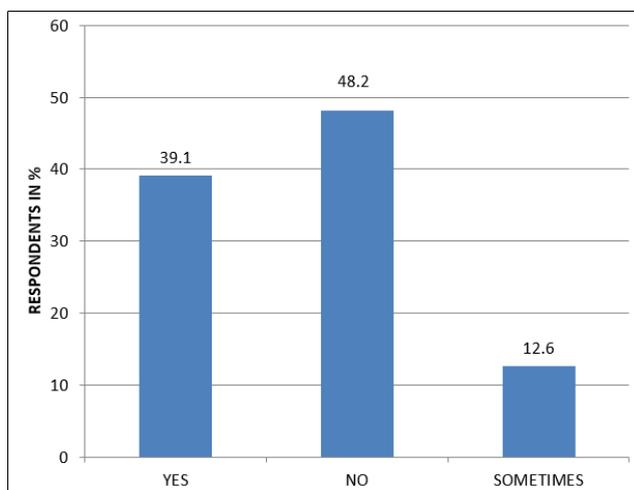


Fig. 5: Cut gloves before disposal

4. Discussion

The effectiveness of an audit based on a self administered questionnaire largely depends on the format, content, analysis and the response rate. In order to avoid any recall bias, the questions were made of closed-end type which enables easy analysis.⁷ Also, since all the participants belong to the same hospital, they undergo similar training and follow similar guidelines from a waste management protocol.

Majority of the subjects (85.2%) have undergone formal training in biomedical waste management in the hospital. Whereas, only 44.29% participants in a study by Sharma S. conducted at some important medical centres in Agra had actually received training about BMW management.⁸ Similar results were obtained in a study by Sreegiri et al in a tertiary level hospital in Visakhapatnam, 89% of the students were not aware of BMW management.⁹

The participants involved in the audit were assessed on their knowledge and awareness about biomedical waste management. The results showed that Nurses and the OT technicians had overall better knowledge regarding BMW management. Whereas, majority of the participants in each category were good to average. This shows that despite giving adequate training to the OT personnel in Safdarjung Hospital, there is lack in proper supervision and implementation of the guidelines.

Awareness about waste segregation at source was comparable among all the categories of OT personnel esp. better with nurses and senior residents.

Knowledge about colour coding and correct disposal was poor among the third year post graduate students and best among the OT technicians, probably because they handle all types of waste daily. A study conducted by Basu et al in a tertiary care hospital in West Bengal to assess the knowledge among junior doctors revealed that only 29.5% knew the various methods of final disposal of BM waste and only 76.4% knew about colour coding bags.¹⁰

Seventy five percent of the respondents knew about the correct method of needle disposal, despite that, only 60% actually destroyed it after use. Results from a study done by Rahul S. Mor et al in Punjab showed that only 56.25% health care facilities used needle cutter to destroy needle.¹¹

Similarly, although 51% knew about the correct method of gloves disposal but only 39% actually disposed off gloves the right way. This again emphasises the fact that training has been given to the participants but there is inadequate surveillance.

5. Conclusion

It can be concluded from the present audit that there is unsatisfactory level of knowledge and awareness about biomedical waste management among OT personnel in Safdarjung Hospital, New Delhi. A subsequent literature review shows that this is a common problem in many hospitals in India. It is essential that biomedical waste is properly segregated and disposed to protect the environment and human health. There is a need of strict implementation of the biomedical waste management guidelines and regular monitoring and surveillance by a separate authority formulated for the same.

6. Source of Funding

None.

7. Conflict of Interest

None.

8. Acknowledgement

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