

Original Research Article

Study on knowledge, attitude and practices regarding biomedical waste management among post graduate residents in a tertiary care hospital of Lucknow

Sugandhi Sharma¹, Trideep Jyoti Deori^{2*}

¹Department of Community Medicine and School of Public Health, PGIMER, Chandigarh, India

²Centre for Community Medicine, AIIMS, New Delhi, India

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*Correspondence:

Dr. Trideep Jyoti Deori,

E-mail: trideep171@gmail.com

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ABSTRACT

Background: It is estimated that 10-25% of the healthcare waste generated is hazardous and presents physical, chemical and/or microbiological risk to the general population and health-care workers associated with handling, treatment, and disposal of waste. All health personnel are expected to have proper knowledge, practice and capacity to guide others for waste collection and management and proper handling techniques. This study was conducted with the aim to assess knowledge, attitude and practices among 1st year post graduate residents in a tertiary care hospital of Lucknow.

Methods: It was a hospital based cross-sectional study carried out in March 2017 on 1st year Junior Residents of King George's medical University, Lucknow. Data was collected using a structured, self-administrated questionnaire, designed to assess the knowledge, attitude and practices on various aspects of bio-medical waste (BMW) management.

Results: Majority (72%) of the residents had an average knowledge about BMW management. About one-fourth of them (27.7%) knew about the maximum time beyond which the waste can't be stored in the hospital while about half of the residents (56.2%) thought that their knowledge regarding biomedical waste is adequate. It was alarming to note that 11.6 percent of the residents were not vaccinated against Hepatitis B.

Conclusions: The residents had average knowledge about BMW management, legislation and color coding. The attitude of residents regarding BMW was good but in practice it was average. There is an essential need for better education to improve the practices of BMW management by well-designed seminars, programs and workshops.

Keywords: Attitude, Bio medical waste management, Junior residents, Knowledge, Practice

INTRODUCTION

The term "biomedical waste" has been defined as "any waste that is generated during diagnosis, treatment or immunization 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 It is estimated that 10-25% of the healthcare waste generated is hazardous and presents physical, chemical and/or microbiological risk to the general population and health-care workers associated with handling, treatment and disposal of waste.² In country like India, where there is a big and complex health care system, mixed economy, private and Government hospitals working together,

while providing services generate a huge amount waste. Hospital waste is generated in India and the waste generation rate ranges from 0.5 to 2 kg/bed/day.³ Uttar Pradesh being the 4th highest in generating Bio-medical waste (43554 kg/day) after Karnataka, Maharashtra and Tamil Nadu.⁴

Several studies have also indicated that the inappropriate handling and disposal of hospital waste poses health risks to health workers.⁵⁻⁷ Since the implementation of the Biomedical Waste Management and Handling Rules (1998), every concerned health personnel is expected to have proper knowledge, practice and capacity to guide others for waste collection and management and proper handling techniques.

Majority of the problem can be avoided if the health care waste is properly managed. It encompasses, planning, organizational, administrative, financial, legal, engineering aspects and human resource development and their management involves inter-disciplinary relationships. Thus, this study was conducted with the aim to assess knowledge, attitude and practices among 1st year post graduate medical residents in a tertiary care hospital of Lucknow.

Aims and objectives of the study was to know the existing knowledge regarding biomedical waste management (BMW) among 1st year postgraduate medical students and to assess their attitude and practices related to biomedical waste management (BMW).

METHODS

It was a hospital based cross-sectional study carried out over a period of 1 month from 1st of March 2017 to 31 st March of 2017, on 1st year Junior Residents of King George’s Medical University, Lucknow. 200 post graduate students are enrolled every year in this institute, out of which 130 1st year post graduate residents, who gave their consent for the study, were finally recruited for the study.

Data collection tool

Data was collected using a pre-designed, structured, self-administrated questionnaire which was designed in English language after thorough review of literature. Questionnaire was designed to assess the knowledge, attitude, and practices on various aspects of BMW such as its hazards, rules, management, the colour coding for segregation and methods used for disposal.

Questionnaire was divided into three parts; part 1 comprised of five questions on “Assessment of knowledge of biomedical waste management”, part 2 included five questions on “Assessment on attitude towards biomedical waste management”, part 3 had six questions on “Assessment on practices related to biomedical waste management”

Procedure for data collection

After taking written consent for the study, the questionnaire was personally administered and the residents were explained regarding the motive of the study and how to complete the questionnaire. It was emphasized that the confidentiality of the responses made by them would be strictly maintained.

Data analysis

Data compilation and analysis was done using software SPSS 23.0 version. Proportions and percentage were used to interpret the result. Questions were marked right or wrong. Each correct response was given one score and the total was calculated for each part. Grading was done as good (>80%), average (>60-80%) and poor (≤60%) based on the scores secured.

RESULTS

Majority (72%) of the residents had an average knowledge about BMW management and around one-fourth of them (20%) had good knowledge on the subject while 8 percent of the residents were found to have a poor knowledge (Figure 1).

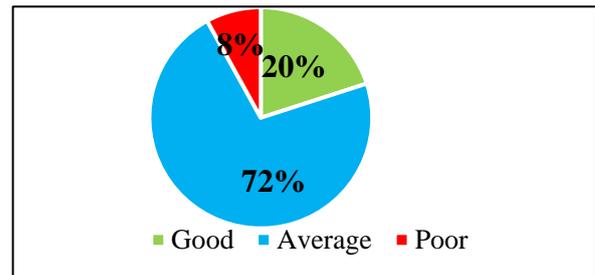


Figure 1: Grading of knowledge of BMW management among postgraduate medical residents.

Majority (86.2%) of the study participants were aware of BMW management rules but only about one-fourth of them (27.7%) knew about the maximum time beyond which the waste can’t be stored in the hospital. A majority (78.5%) of the residents knew about the segregation of BMW as per color coding while 59.2 percent of the residents were aware about the percentage of infectious waste generated in the hospital. About 16.1% residents didn’t know the symbol for the biomedical waste (Table 1).

The attitude-based questions were well-responded by the study participants. All of the residents considered that BMW management is a team work. Majority (97%) of residents felt that biomedical waste management should compulsorily be made part of the post graduate curriculum. Majority of them (83.8%) were willing for the further training on biomedical waste management. 40.0 percent of residents felt that safe management increases the financial burden of the hospital. About 91

percent residents felt that it is important to label the biomedical waste (Table 2).

Table 1: Knowledge of postgraduate residents about bio-medical waste management.

Knowledge of biomedical waste management	Correct answers N (%)	Incorrect answers N (%)
Aware of biomedical waste management rules and legislation	112 (86.2)	18 (13.8)
Segregation of BMW as per Color coding	102 (78.5)	28 (21.5)
Time of storage of BMW in hospital	36 (27.7)	94 (72.3)
Percentage of infectious waste in total biomedical waste	77 (59.2)	53 (40.8)
Symbol of biomedical waste	109 (83.8)	21 (16.1)

Table 2: Attitude of postgraduate medical residents towards bio-medical waste management.

Attitude towards biomedical waste management	Yes N (%)	No N (%)
BMW management is a team work	130 (100)	0 (0)
BMW should be included in UG curriculum	126 (97.0)	4 (3.0)
Further training in BMW required	109 (83.8)	21 (16.1)
Safe management increases the financial burden of the hospital	52 (40)	78 (60)
Importance of labeling biomedical waste	119 (91.5)	11 (8.5)

Table 3: Practices related to BMW management among postgraduate residents.

Practices related to biomedical waste management	Correct answers N (%)	Incorrect answers N (%)
Practicing segregation of BMW at work site	106 (81.5)	24 (18.5)
In which bin broken glass bottles/ vials are discarded	78 (60.0)	52 (40.5)
Disposal of cotton, gauze and blood-soaked items	108 (83.0)	22 (17.0)
Disposal of general waste	118 (90.8)	12 (9.2)
Not recapping the used needle	100 (100)	0
Vaccinated against Hep B	115 (88.4)	15 (11.6)

It was observed that maximum (81.5%) residents were practicing segregation of BMW at work site. 60 percent of the residents correctly answered about discarding the broken glass bottles and vials. Majority (83.0% and 90.8% respectively) of the residents correctly practiced about discarding contaminated cotton and general waste in the right bin. All (100%) of the residents did not recap used needles. It was alarming to note that 11.6 percent of the residents were not vaccinated against Hepatitis B (Table 3).

DISCUSSION

The study revealed several lacunae in the knowledge, and practices among the postgraduate residents. Health professionals have an ethical responsibility towards the environment and themselves. Because of the nature of their profession, they must not forget that they are at risk for treating patients who may have infectious diseases. In this study, most of the residents were in average category as per their scores. A majority of residents had an average knowledge regarding BMW management. Similar findings were observed in a study done by Sekar et al.⁸ 86.2 percent of residents were aware about biomedical waste management rules and legislation. This result was found to be consistent with the findings of the study done by Mehta et al.⁹ In the present study, 27.7 percent post-graduates knew about correct duration till which biomedical waste can be stored. Similar findings were observed by Singh et al.¹⁰ Symbol of BMW was correctly identified by a majority of resident and this observation was similar with the findings of study done by Singh et al.¹⁰ About 78 percent of the participants knew that segregation of waste must be done at the point of waste generation and this finding was consistent with the findings of study done by Karmakar et al and Amin et al.^{11,12}

The attitude-based questions in the present study were well-responded. All of the residents felt that BMW management is a team work. These findings were in accord with a study done by Malini et al.¹³ A majority (97.0%) of them felt that biomedical waste management should compulsorily be made part of the postgraduate curriculum. Mehta et al and Singh et al showed similar results.^{9,10} A majority of residents expressed the need of BMW management training. About 42.0 percent of residents felt that safe management of bio medical waste increase the financial burden on management. These observations were found to be consistent with the finding of study done by Malini et al but were contrasting with the findings of Singh et al.^{13,14} Maximum residents considered it to be important to label BMW. Mehta et al also showed similar findings.⁹

Regarding the practice related to BMW management, 82% of the residents were practicing segregation of BMW as per different colour coded bags, which is nearly similar to the findings of study done by Amin et al.¹² Practices regarding disposal of broken vials were not

found to be appropriate as about only 60.0 percent of residents were practicing it. These figures were higher than a study done by Singh et al.¹⁰ A good number of residents were disposing of general waste and blood soaked item in the correct bin. These findings were similar to the findings by Sharma et al.¹⁵ On asking about vaccination against Hepatitis B, the 88.0 percent of residents were found to be immunised against Hepatitis B. Similar figures were reported by Kushwaha et al.¹⁶ All the residents were following the practice of not recapping the used needle which was found to be similar with results of Mehta et al and Amin et al.^{9,12}

CONCLUSION

The study showed that overall the residents have average knowledge and practice about BMW management. Though the attitude of residents regarding BMW was good. The study revealed that the importance of training regarding bio medical waste management cannot be overemphasized, lack of proper and complete knowledge about bio medical waste management impacts practices of appropriate waste disposal. There is a need of regular training of BMW management. As many residents were not immunized against Hep B so it should be made compulsory before their admission to get vaccinated.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Government of India, Ministry of Health and Family Welfare (MoHFW). National Guidelines on Hospital Waste Management Based upon the Bio-medical Waste (Management and Handling) Rules, 1998. New Delhi: MoHFW. 2002.
- Safe management of waste from health care activities. WHO, Geneva. 1999./ Li CS, Jenq FT. Physical and chemical composition of hospital waste. Infect Control Hosp Epidemiol. 1993;14:145-50.
- Patil AD, Shekhar AV. Health care waste management in India. J Environ Manage. 2001;63(2):211-20.
- Central Pollution Control Board, Annual report on biomedical waste management as per biomedical waste management rules, 2016.
- Chowdhary A. Study of knowledge, behaviour and practice of biomedical waste among health personnel. Int J Community Med Public Health. 2018;5(8):3330.
- Das P, Pal R, Basu M. Assessment of future physicians on biomedical waste management in a tertiary care hospital of West Bengal. J Natural Sci Biol Med. 2012;3(1):38.
- Prashanth V, Jadhav H, Dodamani A, Dodamani G, Kshirsagar M, Vishwakarma A. Assessment of Knowledge, Attitude, and Practices regarding Awareness of Biomedical Waste Management among Health Care Personnel: A Cross-sectional Survey. J Oral Health Commu Dent. 2017;11(1):8-12.
- Sekar M, Swapna M, Easow JE. A study on knowledge, attitude and practice of biomedical waste management among health care workers in a tertiary care hospital in Puducherry. Indian J Microbiol Res. 2018;5(1):57-60.
- Mehta TK, Shah PD, Tiwari KD. A knowledge, attitude and practice study of biomedical waste management and bio-safety among healthcare workers in a tertiary care government hospital in Western India. Natl J Community Med. 2018;9(5):327-33.
- Singh S, Sharma N, Mishra P. Perception regarding bio-medical waste management among medical students in a tertiary care hospital. Indian J Comm Health. 2019;31(1):137-43.
- Karmakar N, Datta S, Datta A, Nag K. A cross-sectional study on knowledge, attitude and practice of biomedical waste management by health care personnel in a tertiary care hospital of Agartala, Tripura. Natl J Res Community Med. 2016;5:189-95.
- Amin P, Sochaliya K, Kartha G. A study to assess the knowledge, attitude and practice regarding biomedical waste management among health care personnel of C. U. Shah Medical College and Hospital, Surendranagar. Int J Commun Med Public Health. 2018;5(10):4377.
- Malini A, Eshwar B. Knowledge, attitude and practice of biomedical waste management among health care personnel in a tertiary care hospital in Puducherry. Int J Biomed Res. 2015;6(3):172.
- Singh GP, Gupta P, Kumari R, Verma SL. Knowledge, attitude and practices regarding biomedical waste management among healthcare personnel in Lucknow, India. Indian J Clin Pract. 2014;24(9):830-3.
- Sharma M, Kapoor P, Verma S, Maheshwari R, Gupta HP. Assessment of knowledge, attitude and practice regarding biomedical waste management among health care personnel in Jawahar Lal Nehru Medical College and Hospital, Ajmer (Rajasthan). Int J Med Res Prof. 2016;2(4):155-8.
- Kushwaha R, Kumar M, Maurya MK, Maurya RP, Jurel SK, Kumari R. Knowledge, attitude and practice about biomedical waste management in laboratory staff in a tertiary care centre in north india: a cross sectional study. Int J Current Res. 2016;8(12):43826-30.

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