

Original Research Article

Knowledge and awareness about biomedical waste segregation and disposal among pre-final year medical students at a tertiary care hospital

Noor Mohamed Rasik Buhari Sareef*, Selvaraj Preethi,
Muthunarayanan Logaraj, Mathew Arumai

Department of Community Medicine, SRM Medical College Hospital and Research Institution, Tamil Nadu, India

Received: 20 April 2022

Revised: 09 May 2022

Accepted: 10 May 2022

*Correspondence:

Dr. Noor Mohamed Rasik Buhari Sareef,
E-mail: mohamedrasik007@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Biomedical waste is any waste that is created during the diagnosis, treatment, or immunisation of human beings or animals, or in research activities pertaining thereto or in the manufacturing or testing of biologicals. India produces 500 tonnes of biomedical waste every day through numerous activities. It is projected that 10-25% of the total waste is produced by the health care sector, which leads to severe health problems. If an appropriate measure is not incorporated into the current system, the negative effects of medical waste on the public and the environment will be hilarious. With this backdrop, a research study was carried out among medical students perusing under graduating in medicine, aiming to optimise their level of knowledge of biomedical waste segregation and disposal.

Methods: A cross-sectional descriptive design was espoused to study among the 3rd year medical students. A random sampling method was chosen to select 150 students. A semi-structured questionnaire was used to collect information from them. Descriptive analysis was employed and the finding was presented in tabular and pictorial forms.

Results: Half of the students had good knowledge over BMW. Awareness of segregation wastes and colour coding among them was very poor.

Conclusions: The study has unearthed the fact that half of the medical students haven't had adequate knowledge of BMW management. Hands-on training at regular intervals with the updated information would enhance the students' knowledge and skills, and fill the lacuna in this area of research.

Keywords: Biomedical waste, Colour coding, Segregation, Prophylaxis

INTRODUCTION

Biomedical waste is any waste that is created during the diagnosis, treatment or immunisation of human beings or animals, or in research activities pertaining thereto or in the manufacturing or testing of biologicals.¹ India is the largest country that produces 500 tonnes of biomedical waste every day through various productive activities. As per the Hippocratic Oath, 'beneficence non-maleficence', should be our main aim. It means to do good and not harm. The waste of the diseased should not be the cause of health

problems in healthy individuals.² It is projected that 10-25% of the total waste is produced by the health care sector, which leads to severe health problems.³ It was found in a study that was carried out abroad that the undergraduate students had acquired a very good knowledge of BMW.⁴ The health sector has become more susceptible to biomedical waste owing to the random disposal of waste that has now emerged as a huge threat to the environment and human health.⁵ In India, legitimate provisions are in place which could mitigate the adverse effect of hazardous and infectious hospital waste on the

community. Nevertheless, these provisions are not fully functional owing to various reasons such as inadequate waste management skills, lack of awareness, health hazards from bio-medical wastes, lack of allocation of monetary and human resources, and improper disposal of BMW. If an appropriate measure is not incorporated into the current system, the negative effects of medical waste on the public and the environment will be hilarious.⁶ The issue of waste management has emerged recently in both developing and developed countries, where there is very little evidence of the execution of behaviour change communication or awareness programs.

With this backdrop, a research study was carried out among medical students perusing under graduating in medicine, aiming to optimise their level of knowledge of biomedical waste segregation and disposal. It would also address the present lacuna existing in this area.

METHODS

A cross-sectional descriptive design was espoused to study among the 3rd year medical students who fulfilled their inclusion criteria, which included the willingness to participate in the study and freedom from emotional problems. The study was undertaken in SRM Medical College Hospital and Research Centre, Tamil Nadu from July 2021 to October 2021 which included 150 students. It is a 1500-bed hospital that caters to the medical education needs of aspiring students across the globe who want to perse their education here. The questionnaire was pretested on 10% of the study population to ascertain that it is easily understandable and answerable. The students involved in the pretesting were not included in the final study.

Although institutional ethical committee approval was not sought for this study, the Dean of the institution approved it with the intention of improving the knowledge of the students about BMW. A random sampling method was chosen to select 150 students from among the entire student body. The study was carried out at the community medicine department, where students were gathered and informed about its purpose and how it could help them acquire innovative knowledge in the future.

Before gathering information from them, a written consent form was distributed, assuring them that the information shared by them would be kept confidential and their identities would be protected.

A semi-structured questionnaire with two domains each with a set of questions on knowledge of BMW and types of segregation was administered among them and gathered the required information for the study. The information that was in each questionnaire was checked, edited, and corrected where necessary, to optimise its quality. Each variable in the questionnaire was assigned numbers during the codification. Subsequently, the information was entered into an excel sheet and further uploaded into SPSS-

12 for descriptive analysis. The data was analysed and presented in tabular and pictorial forms.

RESULTS

In this study 150, 3rd medical students were included. In 150, 60 (40%) of students were female, 90 (60%) of students were male (Figure 1). Out of the 150 students, 50% of students had good knowledge and awareness about BMW management, 35% of students had fair knowledge and the remaining 15% showed poor knowledge of the same (Figure 2). In 150 students, 103 (68.7%) students had good knowledge of BMW as hazard. 112 (74.7%) students had poor knowledge of BMW disposal color coding. In 150 students, 130 (86.7%) students had good knowledge of awareness of prophylaxis (Figure 3). 90% of students had positive attitude towards training program of BMW management (Figure 4).

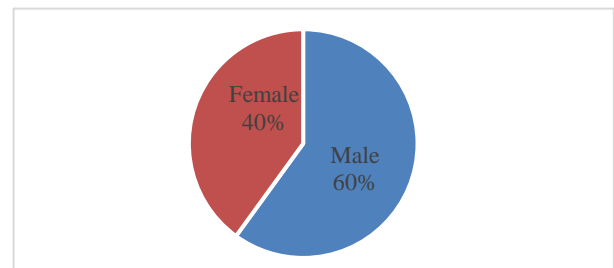


Figure 1: Gender distribution.



Figure 2: Distribution of knowledge in BMW management.

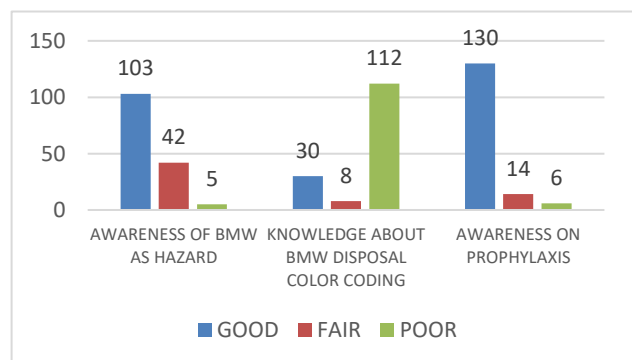


Figure 3: Distribution of level of BMW management.

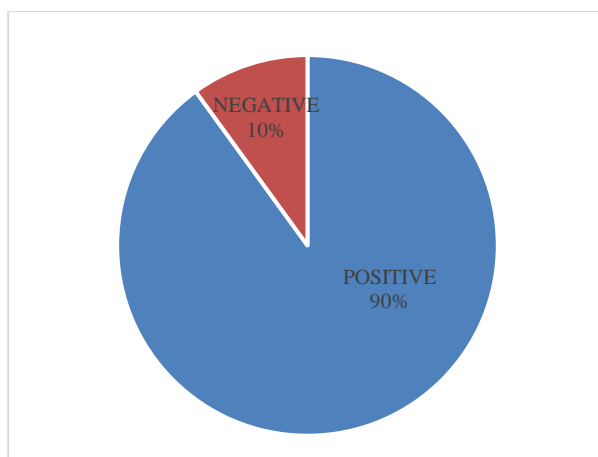


Figure 4: Distribution of attitude towards training program.

DISCUSSION

Numerous studies have been conducted on biomedical waste management (BMW) among health care workers, but only a few on undergraduate MBBS students. One such study in Mewat, Haryana on MBBS students in 2017 revealed 63.45% overall awareness among them.⁷ Regarding colour coding, 43.25% were unaware of the proper segregation of biomedical waste in the categories. Similarly, our study showed overall awareness of 50% among the prefinal year students. Colour coding awareness was poor, with 75% of respondents unaware of which biomedical waste belongs to which category. A similar study among medical students in the 7th semester in Tirupati in 2012 was seen. 71.3% of students were unaware of the categories and colour coding for disposal.⁸

A study conducted in New Delhi, India, among the 64 dentists who were teachers in Government institutions reported that the majority of the respondents were not aware of the proper clinical waste management regulations.⁹ Similar results were found in a study of hospital medical personnel in Agra, which indicated a lack of knowledge and awareness towards legislation on BM waste and even more recently in a study in a dental hospital/clinic in Amritsar.^{10,11}

The students had a very favourable attitude regarding BMW management in our study and most of them were willing to attend educational program on BMW management and it was better than reported by other workers.^{12,13} More students in our study felt responsible for BMW management and segregation and considered colour coding system as a simple method compared to other studies. More percentage of students in our study considered BMW management as financial burden and an extra burden on work in comparison to other reports.¹²

BMW management is concerned, in spite of having good level of knowledge and a positive attitude. Most likely reason for this is that in our institution BMW management

is stressed upon theoretically in the undergraduate curriculum but only 10-15% of students had undergone any formal training for BMW management. So this gap between knowledge and practise can be bridged by giving them hands on training by organizing workshops.

Limitation

The limitations of this study was that it was limited to a single institution.

CONCLUSION

The study has unearthed the fact that half of the medical students haven't had adequate knowledge of BMW management. Hands-on training at regular intervals with the updated information would enhance the students' knowledge and skills, and the execution of many research studies in this area would fill the lacuna. It is also the duty of the medical students to know about safe handling and ensure waste is disposed of properly after segregation. Creating awareness among the public and other important stakeholders would go a long way toward promoting a hazardous-free environment and promoting a positive healthy lifestyle.

Funding: No funding sources

Conflict of interest: None declared

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

REFERENCES

1. Singh Z, Bhalwar R, Jayaram J, Tilak VW. An introduction to essentials of bio-medical waste management. *Med J Armed Forces India.* 2001;57(2):144-7.
2. Bufacchi V. Justice as non-maleficence. *Theoria.* 2020; 67:1-27.
3. Kumar M, Kushwaha R, Maurya MK, Singh G, Kumari R. Knowledge, Awareness and Attitude regarding Biomedical Waste Management among Medical Students in a tertiary health Care centre: A Cross Sectional Study. *Indian J Res.* 2017;6:611-4.
4. Singh T, Ghimire TR, Agrawal SK. Awareness of Biomedical Waste Management in Dental Students in Different Dental Colleges in Nepal. *Biomed Res Int.* 2018;2018:1742326.
5. Sharma A, Sharma V, Sharma S, Singh P. Awareness of biomedical waste management among health care personnel in Jaipur, India. *Oral Health Dent Manag.* 2013;12(1):32-40.
6. Singh LD, Elangbam V, Napoleon T, Christina S. Knowledge on Biomedical Waste Management among Medical Students in RIMS, Imphal, Manipur. *IOSR-JDMS.* 2018;17:40-3.
7. Mewat VP. Awareness of Biomedical Waste Management among MBBS Students at a Tertiary Care Teaching Hospital in Mewat, Haryana. *JMSCR* 2017;5:28328-33.

8. Kahn S, Raviprabhu G. Knowledge About Biomedical Waste Management Among Medical Students of a Tertiary Care Hospital, Tirupati. *Int J Health Res.* 2013;1:41-4.
9. Kishore J, Goel P, Sagar B, Joshi TK. Awareness about biomedical waste management and infection control among dentists of a teaching hospital in New Delhi, India. *Indian J Dent Res.* 2000;11(4):157-61.
10. Sharma S. Awareness about bio-medical waste management among health care personnel of some important medical centres in Agra. *Int J Environm Sci Develop.* 2010;1:251-5.
11. Narang RS, Manchanda A, Singh S, Verma N, Padda S. Awareness of biomedical waste management among dental professionals and auxiliary staff in Amritsar, India. *Oral Health Dent Manag.* 2012;11(4):162-8.
12. Pinto VN, Joshi SM, Velankar DH, Mankar MJ, Bakshi H, Nalgundwar A. A comparative study of knowledge and attitudes regarding biomedical waste (BMW) management with a preliminary intervention in an academic hospital. *Int J Med Public Health.* 2014;4(1):91-5.
13. Kumar M, Kushwaha R, Kumari M, Singh G, Kumari R. Knowledge, awareness, attitude regarding biomedical waste management among medical students in a tertiary care centre: A cross sectional Study. *PARIPEX Indian J Res.* 2017;6(4):611-4.

Cite this article as: Sareef NMRB, Preethi S, Logaraj M, Arumai M. Knowledge and awareness about biomedical waste segregation and disposal among pre-final year medical students at a tertiary care hospital. *Int J Adv Med* 2022;9:718-21.