

Available online at <http://www.ijims.com>

ISSN - (Print): 2519 – 7908 ; ISSN - (Electronic): 2348 – 0343

IF:4.335; Index Copernicus (IC) Value: 60.59; Peer-reviewed Journal

## **Perception, Awareness and Practices of Bio Medical Waste Management in a Teaching Hospital**

Vikrant Prabhakar<sup>1</sup>, Amrit Virk<sup>2</sup>, \*Parmal Saini<sup>3</sup>

<sup>1</sup>Associate Professor, Department of Community Medicine, Adesh Medical College, Kurukshetra

<sup>2</sup>Professor, Department of Community Medicine, Adesh Medical College, Kurukshetra

<sup>3</sup>Assistant Professor, Department of Community Medicine, Adesh Medical College, Kurukshetra

\*Corresponding Author: Parmal Saini

### **Abstract**

The study aims to determine knowledge regarding biomedical waste management policy, attitude & practice of BMW management, prevalence of needle-stick injury and appropriate response to needle stick injury among the doctors working at Adesh Medical College and Hospital, India. A cross-sectional study was conducted using a questionnaire with closed-ended questions. The questionnaire was distributed to all doctors working in the college. The resulting answers were graded and the percentages for each question was obtained and analyzed. The results showed that the level of knowledge and awareness of biomedical waste generation, associated hazards, legislations and management practices among health care personnel is good. However, it was surprising that this is not getting translated to action, especially when their personal well-being is concerned. It was found that none of respondents had an excellent level of knowledge on responding appropriately to needle stick injury and only 17.9% respondents had good knowledge about needle stick injury and its management while 82.1% respondents had an average knowledge. It may be concluded that the knowledge about BMW among doctors is good but there are poor levels of knowledge and awareness about needle stick injury and its management. Regular monitoring and training are required at all levels.

**Keywords:** Perception, Awareness, Practices, Bio Medical Waste Management, Teaching Hospital

### **Introduction**

Medical care is vital for our life, health and wellbeing. Provision of health care requires both out-patient and in-patient services. Quality health care service, whether out-door or indoor, requires consumption of significant amount of commodities. Health care facilities become the second home for the family of the patient, where they spend significant amount of time, doing daily chores while taking care of the patient. This leads to production of a large amount of waste, which includes food waste, packings, single use equipment's etc. Also, provision of quality healthcare also generates large amounts of chemicals as well as other liquid waste. Laundry also gets soiled with body fluids. Though most of it is municipal waste<sup>1</sup>, it needs to be segregated from wastes that can be hazardous, toxic and even lethal because of their high potential for spreading diseases and causing environmental pollution at various levels, before disposal<sup>2</sup>. In the US for example, about 15% of hospital waste is regulated as infectious waste. In India this could range from 15 to 35% depending on the total amount of waste generated, with estimates ranging from 1.00 to 4.5 kg per bed per day<sup>3</sup>. The hazardous and toxic parts of waste from healthcare establishments comprising infectious, medical, and radioactive material as well as sharps constitute a grave risks to mankind and the environment<sup>4</sup>, if these are not properly treated /disposed or are allowed to be mixed with other municipal waste. The threat becomes even grave because of prevalence of highly infective viruses such as Human Immunosuppressive Virus (HIV), Hepatitis B & C<sup>5</sup>. Biomedical waste, because of its infectious nature and serious health hazards need care for its proper collection, segregation and disposal to minimize the pollution of air, water and soil<sup>6</sup>

In India also, people and government both have realized the grave issue of the management of bio medical waste and thus steps are taken in order to manage bio medical waste at various level. The Ministry of Environment and Forests has promulgated The Biomedical Waste (Management and Handling) Rules 1998 for regulating the management of BMW, with an aim to improve BMW management in health care facilities and to minimize consequences of inappropriate disposal<sup>7</sup>. It is not just for the sake of professional duty but should be considered as social and legal responsibility of the community. Management of bio medical waste starts from the point of generation and it continues till the waste is disposed<sup>8</sup>. Knowledge, attitude and practices play an important role in practicing the proper waste management at different level.

Medical Colleges are a vital component of health care service delivery, providing tertiary care to the most severely ill. These also includes patients admitted for long durations, complex procedures, and also includes patients under Intensive care. Medical Colleges produce large quantities of waste, with a greater proportion of biomedical waste, and hence, awareness of BMW management is vital for doctors practicing in Medical Colleges. In India, practical information on this aspect is slowly developing and research on the public health implications because of poor management of medical wastes (both Hospital and Biomedical) is hardly any and limited in scope. Adequate knowledge, attitudes and practices of the staff of the health care institutes play a very important role.

### **Aim**

The study was conducted

1. To assess the knowledge regarding BMW management in a teaching hospital among doctors
2. To assess the perception of doctors towards, and the importance of BMW generation and management
3. To assess the attitude of doctors towards BMW and its management
4. To assess the practice of BMW management among doctors

### **Methods**

The study involved the use of a questionnaire with closed-ended questions, in order to avoid any recall bias<sup>9</sup>. The questionnaire was developed following review of previous studies conducted on the same topic, and was modified and updated on the basis of Biomedical Waste Management Rules issued by the government in the years 2016, 2018 and 2019. It was pre tested amongst the faculty in the Department of Community Medicine. Their feedback was accommodated and the final questionnaire consisted of four sections

1. Knowledge about biomedical waste generation, hazards and legislation,
2. Awareness of biomedical waste management practices,
3. Attitude/Behavior towards BMW , and
4. Knowledge and practices about needle-stick injuries.

The study was approved by the Institutional Ethical Committee.

The questionnaire was shared with the doctors working at Adesh Medical College & Hospital, Kurukshetra. Subjects were volunteers and a verbal consent was taken from all the subjects before they were given the questionnaire. Confidentiality of the participants was maintained. They were requested to complete it send it back to the investigators.

Each section was analyzed separately and the results were grouped as per the following criteria

Excellent – > 80% correct response

Good – 60%-80% correct response

Average – 40% - 60% correct response

Poor - < 40% correct response

## Results

93% of all the questionnaires distributed were returned back. All except 7 formats were found to be complete, and were included in the calculations.

When the questions were asked from the doctors to assess their knowledge regarding BMW generation, hazards of BMW and related legislation, 3.5% had excellent knowledge. Over 93% respondents had above average knowledge about the topic. 3.5% respondents had poor level of awareness (Table 1).

Respondents were asked regarding the importance of BMW management, the hazard BMW poses and how they valued the efforts put in to manage BMW. 82.7 percent of respondents agreed to the high importance given to BMW management, and showed interest in investing more time to learn BMW management. None of the participant described it as a waste of time and resources (Table 2).

Respondents were asked questions to assess their awareness about BMW and its management. 89.7% of the respondents had excellent and good awareness of the practices that must be followed for the management of bio medical waste as per the recommendations, and were aware of activities that could generate BMW. 10.3% of the respondents had average understanding, while none had poor awareness (Table 3).

None of the respondent could answer >80% of asked questions related with actions to prevent and manage needle stick injury correctly. All the respondents answered between 40% to 80% questions correctly (Table 4).

17.8% respondents accepted to following >80% of recommended practices related with BMW. The remaining 82.2% accepted adhering to 40-80% of the practices related with BMW management that were asked (Table 5).

## Discussion

It is heartening to see that more than 80% of respondents view BMW management as important, and are willing to invest time and effort in learning BMW management practices.

However, only a meager 3.5% of the respondents had excellent knowledge about latest BMW legislations. This may be because the changes have been introduced very recently. However, it points towards lack of regular updates being provided to doctors, either through CMEs or on job trainings. 93% of the respondents had good or average understanding of the legislations and hazards. Though this will not be sufficient to ensure good BMW management practices<sup>10</sup> as per latest amendments, it does show the effectiveness of BMW management trainings being given in the curriculum. The results are not different from other studies that have found the level of awareness in India about BMW management to be unsatisfactory<sup>11,12,13</sup>. Regular training of both the technical staff and the nontechnical staff is critical for the proper and appropriate management of biomedical waste<sup>11,13</sup>

The practice of reporting of injuries resulting from improperly disposed biomedical waste has been found to be miserably low among the technical staff<sup>14</sup>. Stein *et al.*<sup>15</sup> in their study reported that among doctors and nurses, only 37% reported that they ever suffered needle stick injury. Low reporting of injuries may be attributed to the fact that most of the doctors and other technical and nontechnical staff are unaware about a formal system of injury reporting which should be established within all the health facilities. The current study shows similar findings. 82.1% respondents had about average knowledge on actions that needs to be taken in case of needle stick injury. None of the doctor was aware on appropriate Infection Control SOPs.

Dowel, in his study, found that levels of knowledge does not gets converted into similar levels of practice. A coefficient of correlation between health knowledge and health practice was found to be 0.27<sup>10</sup>. However, the current study show a better relationship between knowledge and practice, with more than 71% respondents showing excellent to good awareness and adherence to recommended practices.

### Conclusion

This study shows that the level of knowledge and awareness among doctors has increased regarding proper disposal of BMW. Also, interest among doctors to learn proper BMW management as well as readiness to participate in BMW management is promising. However, new amendments and updates do not percolate down the system quick enough leading to delayed implementations of recent advances. Also, statutory compliances do happen, but less emphasized and personal protective activities are not given adequate importance and doctors are not aware of internal infection control committee, if any.

Despite knowledge of management of bio medical waste, practice of the same is still a challenge among the service providers. Training and awareness is not the only solution but good monitoring and mentoring is required at teach level of generation and collection of bio medical waste.

### References

1. Managing Clinical Wastes in Developing Countries, Report of a Consultation on Clinical Wastes Management in Developing Countries, WHO, Geneva, September 1992, pub 1994, ed: Dr. Adrian Coad. 94
2. Singh V. P., Biswas G., and Sharma, J. J., Biomedical Waste Management - An Emerging Concern in Indian Hospitals Indian, Journal of Forensic Medicine & Toxicology, Vol. 1, No. 1. (2007-12).
3. Glenn, Mc.R & Garwal, R. Clinical waste in Developing Countries. An analysis with a Case Study of India, and a Critique of the BasleTWG Guidelines (1999)
4. Singh IB, Sharma RK. Hospital Waste Disposal System and Technology. Journal of Academy of Hospital Administration. July 1996; 8(2): 44-48.
5. Palwankar PV, Singh A. Safety and measures for auxiliary staff associated with hospital waste disposal. Indian Journal of Dental Sciences. 2012; 4: 104-106.
6. Rao SKM, Ranyal RK, Bhatia SS, Sharma VR. Bio Medical Waste Management: an Infrastructural Survey of Hospitals. MJAFI, 2004; 60(4): 379-382.
7. Government of India, Ministry of Environment and Forests. Bio-Medical Waste (Management and Handling) Rules. Gazette of India. 1998 (27 Jul). Available from: <http://envfor.nic.in/legis/hsm/biomed.html>
8. 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.
9. Sudhakar V, Chandrashekhar J. Dental health care waste disposal among private dental practices in Bangalore City, India. International Dental Journal. 2008; 58: 51-54.
10. Linus J. Dowell (1969) The Relationship between Knowledge and Practice, The Journal of Educational Research, 62:5, 201-205, DOI: 10.1080/00220671.1969.10883815
11. Pandit NB, Mehta HK, Kartha GP, Choudhary SK. Management of bio-medical waste: Awareness and practices in a district of Gujarat. Indian J Public Health 2005;49:245-7
12. Rao PH. Report: Hospital waste management--awareness and practices: A study of three states in India. Waste Manage Res 2008;26:297-303.

13. 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;11:157-61.
14. Mathur V, Dwivedi S, Hassan M, Misra R. Knowledge, Attitude, and Practices about Biomedical Waste Management among Healthcare Personnel: A Cross-sectional Study. *Indian J Community Med.* 2011;36 (2):143–145. doi:10.4103/0970-0218.84135
15. Stein AD, Makarawo TP, Ahmad MF. A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. *J Hosp Infect* 2003;54:68-73.

## Tables

**Table 1: Knowledge of BMW generation, hazards and legislations**

Level of knowledge	Excellent	Good	Average	Poor
% of responders	3.5	51.7	41.4	3.5

**Table 2: Importance on BMW practices**

Level of importance	Excellent	Good	Average	Poor
% of responders	82.7	17.2	0	0

**Table 3: Awareness of practice regarding Bio Medical Waste generation and appropriate management**

Level of awareness	Excellent	Good	Average	Poor
% of responders	37.9	51.7	10.3	0

**Table 4: Knowledge about Needle Stick Injury and subsequent management among doctors**

Level of knowledge	Excellent	Good	Average	Poor
% of responders	0	17.9	82.1	0

**Table 5: Appropriate Bio Medical Waste management practices followed**

Level of adherence	Excellent	Good	Average	Poor
% of responders	17.8	53.5	28.6	0