

# Biomedical waste management in an indian hospital



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## Introduction:

The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the environment as well.

According to Bio-Medical Waste (management and handling) rules, 1998 of India, Bio Medical Waste (BMW) means any solid, fluid, or liquid waste including its containers and any intermediate product which is generated during the diagnosis, treatment, or immunization of human beings or animals or in research activities pertaining there or in the production or testing of biological and includes categories for same <sup>1</sup>

The large volumes of health care waste if not managed properly can lead to a global hazard. This could not only lead to the spread of highly contagious diseases but the hazardous chemical waste produced by the use of items can cause considerable damage to the ecosystem and the environment. <sup>2</sup>

Majority of waste (75-90%) produced by the healthcare providers is non-risk or general and it is estimated that the remaining (10-25%) healthcare waste is regarded as hazardous the potential for creating a variety of health problems. <sup>3</sup>

Infectious waste may contain any of a great variety of pathogenic microorganisms. Pathogens in infectious waste may enter the human body via number of routes: through a puncture, abrasion, or cut in the skin;

through the mucous membranes; by inhalation; by ingestion .<sup>4</sup> Bio medical waste collection and proper disposal has become a significant concern for both the medical and general community. Among all health problems, there is a particular concern with HIV/AIDS, Hepatitis B and C, for which there is a strong evidence of transmission through healthcare waste.<sup>5</sup> In the healthcare sector alone, the World Health Organization estimates that unsafe injections cause approximately 30, 000 new HIV infections, 8 million HBV infections, and 1. 2 million HCV infections worldwide every year.<sup>6</sup> The BMW rule applies to all those who generate, collect, receive, store, transport, treat, dispose or handle BMW in any manner and also to every institution that generate BMW.

Effective management of biomedical waste is not only a legal necessity but also a social responsibility. Hence, there is a need for resource material to help administrators, doctors, nurses and paramedical staffs. The purpose of Bio-Medical Waste are mainly to reduce waste generation, to ensure its efficient collection, handling, as well as safe disposal in such a way that it controls infection and improves safety for employees working in the system. For this, a conscious, coordinated and cooperative effort has to be made from all Hospital staff<sup>7</sup> . India already has biomedical waste management regulations including a ban on the incineration of biomedical waste with the exception of human and animal waste at the Union level, but their implementation and enforcement throughout the country has been inconsistent.

The present cross sectional questionnaire study was conducted in Ahmedabad city, Knowledge, Attitude and Practices of interns, graduates & post graduates at private dental colleges in Ahmedabad regarding biomedical waste management.

### Material and Method

Ahmedabad is the largest city and former capital of the Gujarat. Ahmedabad is located on the banks of river Sabarmati, 32 km from the state capital Gandhinagar. <sup>7</sup> The study sample includes intern, graduates and post graduates from private dental college in Ahmedabad.

This study was conducted in private dental colleges in Ahmedabad City, Gujarat, India. A total of 135 dentists were selected, from which interns, graduates and postgraduates were divided equally. The selection of samples for the study was carried out by using simple random sampling technique. To make the sample more representative 45 Dentists from each private dental college were selected randomly. The sample size of 135 was determined. From each group from each college we have taken 15 subjects. Participants who do not want to participate in the study, not responding after repeated reminders and incompletely filled questionnaires were excluded from the study.

The survey was scheduled to spread over a period of 1 month. A detailed weekly schedule was prepared well in advance. Although a detailed schedule was prepared meticulously, few adjustments and changes were done due to logistic reasons. Two days in a week were allotted for conducting the study.

A questionnaire related to biomedical waste in the form of multiple choices was given to each participant and the response sheets were collated after a week. Principal Investigator collected the data. A pilot study was conducted on 20% of the total sample size to check the feasibility of the study and to validate the questionnaire. Prior to study a questionnaire was pre-tested and validated. The questionnaire was validated for construct and content validity, reliability and ease of use. Content and construct validity shows no significant changes. Questionnaire showed high degree (0.89) of agreement during test-retest of questionnaire. Those individuals who participated in the pilot study were not considered for the main study to prevent possible bias.

The purpose and procedure of the study was informed to each participant and also participant information sheet was provided to each participant, which explains all aspects of the study. It was explained to them that they had no obligation to complete the questionnaire and could abandon it at any point without stating a reason.

After explaining the purpose of the study, the informed consent was obtained from each participant who was willing to participate in the study. Data was collected by using pre-tested self-designed questionnaire. The questionnaire was developed in English only because it was expected that all doctors and nurses were able to comprehend English. The questions were framed in three sets; knowledge, attitude and practices of interns, graduates and postgraduates in relation to Bio-medical waste management. Each participant was given a separate copy of the questionnaire personally by investigator and requested to fill it up within seven days. Collected data was coded, compiled and tabulated. The data was analyzed by applying <https://assignbuster.com/biomedical-waste-management-in-an-indian-hospital/>

descriptive and inferential statistical analysis. Analysis was carried out using SPSS package version 17.

Result:

The present study was conducted to assess “ knowledge, attitude and practices of interns, graduates & p. g. Students at private dental colleges in Ahmedabad regarding biomedical waste management. A total of 135 participants from private dental colleges of Ahmedabad city were included in the study population.

Table 1. illustrates the distribution of subjects according to their gender. Out of 135 participants 79 (58. 5%) were male and 56 (41. 5%) were female. We can see the answers given by the participants in table 2 which is self explanatory.

Table 3. illustrates that the majority of the participants were having good knowledge regarding bio medical waste management. Whereas their attitude towards the same was found little low which is an alarming situation (table 4) and they were doing fair practice of the same which is shown in (table 5).

Table 1: The distribution of subjects according to their gender

Gender	Interns	Graduates	Postgraduates	Total
Male	26	25	28	79
Female	19	20	17	56

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Total 45 45 45 135

Table 2: Answers given by participants

Question	Yes / No/			
	Correct	Wrong		
Intern	UG	PG	Inter n	U
Do you know about BM waste generation and legislation?	40	41	37	0
Do you think it is important to know about BM waste generation, hazards and legislation?	44	45	42	0
Biomedical Waste (Management & Handling) Rules were first proposed in	32	22	40	1
Amendments to the Biomedical Waste (Management & Handling) Rules were made in	09	12	22	3
According to the Biomedical Waste (Management & Handling) Rules, waste should not be stored beyond	31	35	17	1
Recognize the symbol for biohazard	42	44	44	0

Safe management of health care waste is not an issue at all	42	45	45	0
Safe management efforts by the hospital increase the financial burden on management.	29	24	20	1
Safe management of health care waste is an extra burden on work	39	41	42	0
Do you think that the college should organize separate classes or a continuing dental education program to upgrade existing knowledge about biomedical waste management?	40	43	44	0
Will you like to attend voluntarily programs that enhance and upgrade your knowledge about waste management?	36	43	42	0
Solid dressings and used impression materials disposed in	14	29	28	3
Objects that may be capable of causing punctures or cuts – How should these objects be disposed of?	26	12	12	1

Table 3: shows overall knowledge of subjects:

Subject	Good	Fair	Poor
Interns	29 (64.	11 (24.	05 (11.



	4%)	4%)	2%)
Graduates	26 (57.8%)	13 (28.9%)	06 (13.3%)
Post Graduates	32 (71.1%)	08 (17.7%)	05 (11.2%)

Table 4: shows overall attitude of subjects:

Subject	Good	Fair	Poor
Interns	32 (71.1%)	09 (20.1%)	04 (8.8%)
Graduates	30 (66.7%)	11 (24.4%)	04 (8.9%)
Post Graduates	35 (77.8%)	08 (17.8%)	02 (4.4%)

Table 5: shows overall practice of subjects:

Subject	Good	Fair	Poor
Interns	27 (60.0%)	11 (24.4%)	07 (15.6%)
Graduates	30 (66.7%)	10 (22.2%)	05 (11.1%)

	7%)	1%)	2%)
Post	32 (71.	11 (24.	02 (04.
Graduates	1%)	4%)	5%)

#### Discussion:

The participants involved in this study were assessed for knowledge, attitude and practice of BMW management. Interestingly, this study revealed that the awareness and proper practice of biomedical waste management was satisfactory which is correlating with the study of Sachan R.. According to World Health Organization, " The human's element is more important than the technology. Almost any system of treatment and disposal that is operated by well-trained, and well-motivated staff can provide more protection for staff, patients and the community than an expensive or sophisticated system that is managed by staff who do not understand the risks, and the importance of their contribution" <sup>8</sup> (World Health Organization)

For effective management of hospital waste it is essential that personnel hold positive attitude towards care of the environment, occupational health and safety and teamwork. Hospital waste management has major attitudinal and behavioral components <sup>9</sup>

Literature search show poor knowledge, attitude and practices of biomedical waste management among staff and have reported that there is urgent need to train and educate all the staff, in order to adopt an effective waste management practice. Which is not exactly matching with our studies. A chain is as strong as the weakest link in it, thus the entire staff involved in

waste management at some point or the other should be trained properly. Our study shows almost all of the participants were having good knowledge of bio medical waste, which is not in siding with the study of Sudhakar V <sup>10</sup> .

Before providing the training program, it is mandatory to understand the existing gaps and deficiencies in the study participants' knowledge, perceptions, and behavior towards hospital waste management. Knowledge, attitude and practices of the personnel play an important role. Lack of these, even with good infrastructure and technology, is of little or no use in proper waste management. Knowing this, the training program can be aimed to make participants understand-environment friendly, healthy and economically viable in-house management systems, to ensure that the waste is carried responsibly from cradle to grave.

#### Conclusion:

Optimal waste management is at best, a moving target. Usually attenders are responsible for spearheading the waste management initiatives. Waste handling is left to lower-level workers who operate without any training, guidance, and supervision. Managing waste requires effective management of people who produce the waste, not just those who handle it. It's primarily the dentists who are responsible for waste generation. But currently, as most of us are aware it is mainly the resistant attitude of dentists that is responsible for poor results on this front. Dentist at the high end of hierarchy should take this issue, which needs to be addressed not as a burden difficult to bear. Proper management of dental hospital waste should be addressed with dignity, by concerted action as duty, and by no uncertain terms as

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responding to pressure. They probably should not do it because there is legislation, but they need to do it, as they are also socially accountable.

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