



Awareness of Biomedical Waste Management among Health Care Personnel in Bareilly International University, Bareilly, India

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INTRODUCTION: Biomedical Waste is defined as any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biological products. Healthcare workers are one of the main contributors to the healthcare waste management process.

AIM: The study aimed to assess the level of awareness and attitude regarding biomedical waste management policy and practices among health care workers at Bareilly International University, Bareilly, India

MATERIALS AND METHOD: A cross-sectional study was conducted using a questionnaire with closed-ended questions which was distributed to 150 medical, 154 dental and 100 Class IV employees at Bareilly International University, India. The responses in the questionnaire were used to assess their knowledge of biomedical waste disposal. The responses were evaluated, and each participant's percentage of correct and incorrect responses for each question was calculated.

RESULTS: The results indicated that all healthcare professionals had a low degree of knowledge and awareness regarding the risks associated with biomedical waste formation, legal requirements, and management. Only 11 (7.14%) dental interns had excellent knowledge about biomedical waste generation and legislation while 5 (3.33%) medical interns had extremely poor knowledge about it. Only 4 (4%) Class IV employees had an excellent awareness of biomedical waste management practices. Only 34 (22.08%) dental interns had an excellent level of knowledge of needle-stick injuries among health care personnel.

CONCLUSION: It was concluded that health care professionals have a low degree of knowledge and awareness regarding the risks of biomedical waste generation, laws, and management at Bareilly International University, India hence there is a requirement for regular monitoring and training at all levels of healthcare.

KEYWORDS: Biomedical Waste Management, Hazards, Hospitals, Interns, Questionnaire

INTRODUCTION

There have been significant changes in the healthcare system over the years, but it is ironic that healthcare environments that restore and retain health care also threaten the safety of patients. One of the biggest threats comes from improper waste management which poses a huge risk to public health, the safety of patients and professionals and environmental degradation.

Biomedical Waste is defined as any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biological products.¹

Hospitals produce biomedical waste in both solid and liquid forms. Any blood or body fluid-contaminated waste may be referred to as infectious waste. India is reported to produce 0.33 million tonnes of hospital waste per year.²

A particular rule is followed for the handling,

segregation, transport and disposal of biomedical waste. The Medical Waste Management Regulations were issued by the Government of India in 1998 and came into effect in January 2003. These rules apply to all those who generate, collect, receive, store, transport, treat, dispose or handle biomedical waste in any form. The law provides for the scheduling of biological waste treatment facilities, such as autoclaves, microwave systems, and incinerators, for the treatment of waste or for assuring the necessary treatment of waste at any other waste treatment facility. Even after the law's implementation, practice in Indian hospitals has not yet reached the intended standard, despite its statutory provision for biomedical waste management.¹

Lack of proper waste management, inadequate awareness of biomedical waste's health risks, inadequate financial and human resources and poor waste management are the most serious problems associated with healthcare waste.³



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Healthcare workers are one of the main contributors to the healthcare waste management process. Although their efforts may seem to be small, their every step builds a base of sound morals and rationale that is necessary for the success of the whole community, Hence awareness is important to prevent themselves as well as the patients from its hazards.⁴

Therefore, the present study was conducted to assess the level of awareness and attitude among health care workers at Bareilly International University, Bareilly, India.

MATERIALS AND METHOD

A descriptive cross-sectional study was conducted on medical and dental interns and Class IV employees of Bareilly International University, India.

The sample size of the study was determined conveniently. A self-reported questionnaire was distributed among 150 medical, 154 dental, and 100 Class IV employees who were present on the day. The questionnaire was adapted using pre-validated and pre-tested questionnaires from earlier studies.⁵ Ethical approval for this cross-sectional closed-ended questionnaire study was obtained from the Institutional Ethical Committee, Institute of Dental Sciences, Bareilly.

There were four main categories of questions in the study. This questionnaire consisted of 37 questions which were designed to acquire information about knowledge of biomedical waste generation and waste management practices. The questions were divided into four categories:

1. Biomedical waste generation, health hazards and legislation
2. Biomedical Waste management practices
3. Attitude assessment
4. Needle-stick injuries.

The participants' confidentiality was maintained. The participants were asked to select the best response to each topic. Each question's percentage of correct and incorrect responses from each participant was calculated. All the results were entered into spread excel sheet and analyzed. Results were expressed as percentages and numbers. Based on the responses obtained in the above 4 categories of questions, results

were graded into three groups- excellent, good to average and poor.

RESULTS

A total number of 404 respondents participated in the observation. The study population's mean age was 28.5 years. Among them females (83.5%) outnumbered males.

Level of knowledge of biomedical waste generation, hazards and legislation among health care personnel.

Table 1 summarizes the level of knowledge about biomedical waste generation and legislation. It was surprising that only 11 (7.14%) dental interns exhibited excellent knowledge about the generation and legislation of biomedical waste while 5 (3.33%) medical interns had very poor knowledge about it.

LEVEL OF KNOWLEDGE						
Health care personnel	POOR		GOOD		EXCELENT	
	No	%	No	%	No	%
Medical	5	3.33%	139	92.67%	6	4.00%
Dental	39	25.32%	104	67.53%	11	7.14%
Class IV employees	11	11.00%	87	87.00%	2	2.00%

Table 1. Level of knowledge of biomedical waste generation, hazards and legislation among health care personnel.

Level of awareness of biomedical waste management practices.

Table 2 summarizes awareness about waste management practices, it was found that only 4 (4%) Class IV employees demonstrated excellent knowledge about biomedical waste management practices.

Attitude/behaviour assessment towards biomedical waste.

Table 3 summarizes attitudes towards biomedical waste among all the participants only 30 (20%) medical interns had poor attitudes towards biomedical waste management.

The majority of the study participants (90%) agreed

LEVEL OF AWARENESS						
Health care personnel	POOR		GOOD		EXCELENT	
	No	%	No	%	No	%
Medical	46	30.67%	83	55.33%	21	14.0%
Dental	97	62.99%	41	26.62%	16	10.39%
Class IV employees	24	24.00%	72	72.00%	4	4%

Table 2. Level of awareness of biomedical waste management practices.

with the fact that waste management requires teamwork and no single team member can be held responsible.

ATTITUDE/BEHAVIOUR ASSESSMENT TOWARDS BIOMEDICAL WASTE						
Health care personnel	POOR		GOOD		EXCELENT	
	No	%	No	%	No	%
Medical	30	20.00%	81	54.00%	39	26.00%
Dental	30	19.48%	93	60.39%	31	20.13%
Class IV employees	2	2.00%	82	68.00%	16	16%

Table 3. Attitude/behaviour assessment towards biomedical waste.

Level of knowledge of needle-stick injuries among health care personnel.

Table 4 summarizes the knowledge of needle-stick injuries. The results found that only 34 (22.08%) dental interns demonstrated excellent knowledge of needle-stick injuries among all health care personnel.

LEVEL OF KNOWLEDGE OF NEEDLE-STICK INJURIES						
Health care personnel	POOR		GOOD		EXCELENT	
	No	%	No	%	No	%
Medical	33	22.00%	89	59.33%	28	18.67%
Dental	46	29.87%	74	48.05%	34	22.08%
Class IV employees	39	39.00%	55	55.00%	6	6.00%

Table 4. Level of knowledge of needle-stick injuries among health care personnel.

DISCUSSION

The study sought to evaluate knowledge, attitude and practice toward biomedical waste management among the medical and dental interns and Class IV employees of Bareilly International University, India.

Results of the study found that Class IV employees, medical interns, and dental interns had low levels of knowledge and awareness of the risks associated with the development of biomedical waste, as well as the related laws and management practices. Even the level of understanding and awareness of needle-stick injuries was inadequate.

The study's results are in accordance with prior studies. The majority of respondents to a study of 64 dentists who taught in government institutions in New Delhi, India, reported that they were unaware of the proper guidelines for managing clinical waste.⁶

In a study of hospital medical staff in Agra, similar results were found,⁷ which demonstrated a lack of knowledge and awareness regarding biological waste legislation, and more recently in a research conducted in an Amritsar dental hospital/clinic.⁸ One-third of the workers at a tertiary level hospital in Visakhapatnam did not know where the hospital's waste was ultimately handled and disposed of, the similar issue may even exist at more specialized medical facilities.⁹ According to the others, the waste was collected in bags and dumped inside the hospital's grounds before being collected by an unidentified private service. However, a study conducted in Mangalore city, India, to evaluate the management of dental biomedical waste and private dental practitioners' awareness of waste management policy revealed that many practitioners were aware of the legislation policy but had neglected to get in contact with and register their clinic with the certified waste management services of the city.¹⁰

Another study compared the knowledge, attitude and practices of biomedical waste among health care personnel and found that doctors, nurses, and laboratory technicians had higher knowledge than the cleaning (sanitary) employees.¹¹ In contrast, another study found that many dentists had appropriate knowledge about biomedical waste management but they lacked proper attitude and practices to deal with the problem.¹²

In the present study, only 7.14 % of dental interns had excellent knowledge which was lower than the results of a study conducted by Sharma et al. where 30% had excellent knowledge.⁵

Thus, It can be determined that introducing laws alone is insufficient to ensure the appropriate disposal of biomedical waste. The general public must be aware of these rules, and that appropriate enforcement procedures and policies are developed.

When possible, proper precautions should be taken to reduce hazardous waste, or steps should be taken to guarantee that all collected waste is disposed of by environmental legislation.¹³

In hospitals, primary care clinics, and at key locations (such as next to trash bins), information about the risks associated with biomedical waste can be displayed on posters with instructions on waste segregation. All sorts of healthcare workers should have access to compiled data on various disposal methods and modern technology. Staff habits and public perception are two typical barriers that ought to be addressed. It is advised to improve localised control and make improvements to the organization's general infrastructure. The recommendations are also focused on creating strategic alliances between the various government and institution departments. An important challenge to be overcome is the need to transition from the idea of "waste management" to one of sustainable resource use, including techniques for waste minimization at source and recycling.¹⁴ Therefore, it is strongly advised that waste management programmes be included in academic curricula for all healthcare professionals as well as in continuing dental education. The present study was conducted on a small group of subjects and in just one medical university. Therefore, it is recommended that similar studies should be performed on a larger sample size.

CONCLUSION

From the current study, it can be inferred that health care professionals have a low degree of knowledge and awareness regarding the risks of biomedical waste generation, laws, and management at Bareilly International University, India. A subsequent assessment of the literature suggests that this is a prevalent problem in many other healthcare facilities in India and other countries. Waste must be segregated and disposed of safely to protect both the environment

and human health and this can be achieved by regular monitoring and training at all levels.

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