

Assessment of Knowledge, Attitude and Practice Regarding Biomedical Waste Management among Health Care Personnel in Jawahar Lal Nehru Medical College and Hospital, Ajmer (Rajasthan)

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ABSTRACT

Background: Lack of proper knowledge and faulty practices in biomedical waste management is common in developing countries like India. This study was conducted in the department of surgery of a tertiary level hospital attached with medical college. The purpose of the study was to evaluate lacunae in disposal of hospital generated wastes and recommend steps to rectify the prevalent scenario.

Material and Methods: An observational cross sectional study was undertaken in the department of surgery, J.L.N. Medical College, Ajmer (Rajasthan) in the month of January 2016, with a study group of 123 health care professionals comprising of doctors, nursing staff and class 4 workers. A semi structured questionnaire was used to assess knowledge, attitude and practices regarding Biomedical Waste Management among the study group. The data was analyzed using proportion and percentages.

Results: The data showed that knowledge regarding hazardous nature of biomedical waste, duration of waste storage and utility of plastic bags were less than satisfactory levels. Only 42% of doctors and 31% of nursing staff had undergone BMW (Bio-Medical Waste) management training. They were however, willing to be part of BMW management plan and majority of the group agreed on the need to conduct CME programs to upgrade knowledge. Faulty practices were noted in disposal of pharmaceutical waste, sharps and general

waste. Majority claimed that they use the personal protective equipment (PPE) i.e. gloves etc.

Conclusion: Inference drawn from the data shows an enterprising attitude of health care workers towards BMW management, but prevalence of wrong practices mostly stemming from lack of knowledge. This study shows that there is a regular need for CME (Continuing Medical Education) in the department of surgery, for improving the knowledge of health care personnel.

Keywords: Biomedical Waste, Health Personnel, KAP.

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INTRODUCTION

The term "biomedical waste (BMW)" is defined as "any waste that is generated during diagnosis, treatment, immunization of human beings or animals, in the research activities pertaining to their production or testing.^{1,2} Biomedical waste management has recently emerged as an issue of major concern not only to hospitals, nursing home authorities and health care centers but also to the surrounding environment.^{3,4} Advances in medical facilities and the introduction of more sophisticated instruments has increased the waste generation per patient in health care units worldwide.⁵ It is estimated that 20-25% of the healthcare

waste generated is hazardous and causes serious health related problems.⁶ The waste thus generated in the hospital has significant health impact not only on the healthcare workers but also on the general public. Inadequate and inappropriate handling of health care wastes has serious public health issues and significant influences on the environment. BMW Management is currently a burning issue due to the aforementioned reasons. India generates around three million tons of biomedical waste each year and its generation is expected to grow at a rate of eight percent annually.

The absence of proper waste management, lack of awareness about the health hazards from BM waste, insufficient financial and human resources and poor control of waste disposal are the most critical problems. Although there is increased global awareness among health care professionals about hazards management techniques, the level of awareness in India has been found to be extremely inadequate.⁷

Hence this study was undertaken with the objective to assess the knowledge regarding the BMW, to identify the gaps in the practice of effective BMW management by the healthcare workers and to put into practice essential protocols for training of HCWs in the field of BMW management.

MATERIAL AND METHODS

This is an observational, descriptive; cross sectional hospital based study. The hospital is an 1000 bedded tertiary health care

centre associated with medical college, located in Ajmer, Rajasthan. The healthcare workers included in the study have been divided into three sub groups; doctors, nursing staff and class 4 employees. The study sample includes 28 doctors, 80 nursing staff and 15 class 4 workers.

The study was in the form of a pre designed, self-testing questionnaire. The questionnaire was divided into 3 parts; each pertaining to knowledge, attitude and practice. The questions included in each part were developed by the authors after going through articles and studies of a similar context.

The questionnaire was delivered in interview form to the class 4 workers, in simple language that they could comprehend. Confidentiality regarding the identity of the HCW and their responses were maintained. The percentage of correct and incorrect answers for each questions from the participants were obtained and used to interpret the extent of awareness.

Table 1: Displaying proportion of correct responses regarding knowledge about bio medical waste management

S.No	Questions regarding BMW knowledge	Doctors (n-28)	Nursing staff (n-80)	Class 4 (n-15)
1	Hazardous nature of bio- medical waste	15(53.57%)	10(12.5%)	2(13.33%)
2	Awareness of BMW rules	24(85.71%)	77(97.5%)	8(53.33%)
3	Utility of plastic bags	21(75%)	63(78.75%)	6(40%)
4	Bio medical waste categories	27(96.4%)	25(31.25%)	1(6.6%)
5	Disease transmitted by bio medical waste	26(92.40%)	75(93.75%)	12(80%)
6	Duration of storage of bio-medical waste	28(100%)	25(31.75%)	10(66%)
7	Identification of bio-hazard symbol	27(96.4%)	77(96.25%)	7(46.66%)
8	Existence of a plan for BMW management	26(92.4%)	42(52.5%)	8(53.33%)
9	Separate color coding of wastes	27(96.4%)	65(81.25%)	12(80%)
10	On receiving BMW management training	12(42.83%)	25(31.25%)	4(23.33%)

Table 2: Displaying proportion of correct responses regarding attitude about bio-medical waste management

S.No	Questions regarding attitude to BMW management	Doctors (n-28)	Nursing staff (n-80)	Class 4 (n-15)
1	Segregation of wastes into categories	28(100%)	80(100%)	14(93.33%)
2	Use of PPE (personal protective equipment)	28(100%)	74(92.5%)	15(100%)
3	Co-operation to a waste management team	28(100%)	78(97.5%)	15(100%)
4	Responsibility towards waste management	28(100%)	77(96.25%)	15(100%)
5	CME to upgrade knowledge towards BMW	27(96.40%)	73(91.25%)	13(86.66%)
6	Obedience to colour coding	26(92.40%)	70(87.5%)	14(93.33%)
7	Biomedical waste management as an issue	26(92.40%)	79(98.75%)	15(100%)

Table 3: Displaying proportion of correct responses regarding practices related to biomedical waste management

S.No	Questions regarding practices related to biomedical waste management	Doctors (n-28)	Nursing staff (n-80)	Class 4 (n-15)
1	Disposal of cotton , gauze and blood soaked items	27(96.40%)	75(93.75%)	2(13.33%)
2	Disposal of pharmaceutical wastes	25(89.28%)	51(63.75%)	10(66.67%)
3	Disposal of waste sharps	26(92.83%)	70(87.5%)	12(80%)
4	Disposal of rubber materials	25(89.28%)	66(82.5%)	14(93.33%)
5	Disposal of general waste	27(96.40%)	71(88.75%)	12(80%)
6	Disposal of used needles	23(82.14%)	69(86.25%)	11(73.33%)
7	Use of personal protective equipment	26(92.83%)	74(92.5%)	13(86.67%)

OBSERVATIONS AND RESULTS

The study was conducted in the department of surgery among 123 health personnel in the month of January 2016 at Jawahar Lal Nehru Medical College and associate group of hospitals, Ajmer (Rajasthan). They were tested against a semi-structured questionnaire and the data was analyzed using percentage and proportion of correct responses. The observation following analysis of the submitted questionnaires are given in the following tables.

These observations shows that knowledge regarding the hazardous nature of BMW is much lower than expected standards especially amongst nursing staff and class 4 workers (12.5% and 13.33% respectively), whereas awareness amongst doctors was lower than expectations (53.33%). The knowledge regarding the correct duration of storage of BMWs was poor amongst both, nursing staff (31.75%) and class 4 (66%), however their knowledge about BMW as a disease source was greater (93.75% in nursing staff; 80% in class 4). Disappointingly only 42.83% of doctors and 31.25% of nursing staff had received BMW management training. Attitude amongst participants of the study regarding BMW management was encouraging especially in terms of realizing their responsibility towards waste management and volunteering to be a part of a waste management team (greater than 90% in all 3 groups).

Also awareness regarding segregation of wastes into categories and adherence to color coding rules was high especially in class 4 workers (93.33%). All groups stressed on use of personal protective equipments (PPE). Majority of doctors (96.40%) and nurses (91.25%) agreed on continuing medical education (CME) programs being held to upgrade their knowledge regarding BMW management.

The review of practices regarding BMW Management revealed that knowledge about disposal of blood soaked items, pharmaceutical wastes and used needles was low especially amongst class 4 workers (13.33%, 66.67% and 73.33% respectively). All 3 groups claimed universal use of PPE (92.83%, 92.5%; 86.67% amongst doctors, nursing staff and class 4 respectively).

DISCUSSION

This study revealed that majority of the respondents had a fairly satisfactory knowledge about bio medical waste management. However, some lacunas were identified and few areas where improvisations were required. Only 42.8% of doctors and 31.25% of nurses had undergone BMW management training, so there is need for regular CME (continuous medical education) in the department of surgery. The knowledge regarding hazardous nature of waste and utility of plastic bags continue to be areas of concern as reflected in previous studies.⁸⁻¹¹ It was discovered that doctors had higher level of awareness as compared to nursing staff and class 4 workers, in accordance with previous studies.¹²

Overall attitude of respondents regarding biomedical waste management was more promising than those revealed by studies in other developing countries namely Iran, Bangladesh and Pakistan.¹³⁻¹⁵ A majority of respondents wanted to be a part of an waste management team.

A commendable section of the respondents especially doctors and nursing staff displayed good knowledge of color coding and claimed strict obedience to it, comparable to studies in Bijapur,

Karnataka¹⁶ and also to a report submitted by Rao et al.¹⁷ Most of the nursing and class 4 staff demonstrated use of personal protection equipment (PPE) in contrast to studies done in Dakar, Senegal.¹⁸ Awareness regarding disposal of used needles among nursing and class 4 staff were higher than those in Karimnagar, Andhra Pradesh¹⁹, but still below satisfactory levels.

CONCLUSION

It is clear from this study that most of the participants have the right attitude regarding biomedical waste management but faulty practices that is a direct result of lack of knowledge regarding BMW management. This study recommends that continuous medical education (CME) programs and re-orientation programs should be held at regular intervals.

Protocols depicting correct methods of handling infectious and non-infectious waste should be displayed across all nursing stations. The paramedic staff should be provided with safer equipment for personal protection and waste disposal.

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