



Original Research Article

Assessment of Existing Knowledge, Attitude, and Practices Regarding Biomedical Waste Management among the Health Care Workers in a Tertiary Care Rural Hospital

Radha R

Assistant Professor, Department of Community Medicine, Adichunchanagiri Institute of Medical Sciences,
B.G.Nagara, Bellur 571448

Correspondence Email: docradha@rediffmail.com

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ABSTRACT

Background: The waste generated from medical activities can be hazardous, toxic and even lethal because of their high potential for diseases transmission and injury that also results in environmental degradation. An adequate and appropriate knowledge of health care waste management among the health care workers is the first step towards developing favourable attitude and practices thereby ensuring safe disposal of hazardous hospital waste. **Objectives:** 1) To determine the awareness regarding the waste management policy and practices among health care workers. 2) To assess the attitudes of health care workers towards biomedical waste management. 3) To conduct a walk through survey in the hospital to observe current practices of health care workers regarding BMW management so as to assess the need for BMW management training for them. **Materials and methods:** A cross-sectional study was conducted with pre-tested structured questionnaire among the respondents(441) of the health care workers of a tertiary care rural hospital and analysis was done with Microsoft excel. **Results:** The study showed gaps in the knowledge of all the four categories of respondents. The knowledge regarding BMW Management including the policies was better in doctors but practical aspects (BMW segregation, colour coding of BMW, disposal of sharps) was better in nurses and the lab technicians. The practice of recapping the used needles (66.8%) and non reporting of injuries (87%) was present in all the 4 categories. Ignorance regarding safe disposal of BMW, unfavourable attitude and risky practices among the sanitary staff was clearly evident. The walk through survey revealed casual attitude of the doctors in handling sharps and inability to colour code the BMW as compared to the nurses and lab technicians.

Keywords: BMW (biomedical waste), Health care workers, knowledge, attitude, practice.

INTRODUCTION

'Bio-medical waste' means any solid and/or liquid waste including its container and any intermediate product, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research pertaining thereto or in the production or testing thereof. ⁽¹⁾

All individuals exposed to BMW (medical staff, patients, visitors, sanitary staff and general public) are potentially at risk of being injured or infected if BMW is not managed properly also it causes environmental degradation if not handled appropriately.

The physico-chemical and biological nature of these components, their toxicity and potential hazard are different, necessitating different methods /options for their treatment / disposal according to the Bio-medical Waste (Management and Handling) Rules, 1998 (Annexure II), therefore, the waste originating from different kinds of such establishments, has been categorised into 10 different categories and their respective disposal options have been indicated.

Though legal provisions [Biomedical Waste (management and handling) Rules 1998] ⁽²⁾ exist to mitigate the impact of hazardous and infectious hospital waste on the community, still these provisions are yet to be fully implemented. The problem is fuelled further with lack of awareness about the health hazards from biomedical wastes, insufficient financial and human resources, and poor control of waste disposal. ⁽³⁾

A proper knowledge among the health care workers about the rules and regulations of BMW and a clear understanding of their roles and responsibilities in handling BMW can go a long way towards the safe disposal of hazardous hospital waste and protect the community from various adverse effects of

the hazardous waste. Also being a teaching medical college adequate and appropriate knowledge of BMW management among the health care workers can have a pivotal role in dissemination of information to others. With this background this study was undertaken in view of assessing the existing knowledge, attitude and practices of the health care workers in a tertiary care rural hospital regarding the management of BMW.

MATERIALS AND METHODS

Study design: A cross-sectional study.

Study setting: tertiary care rural medical college, Adichunchanagiri medical college. B.G.Nagara

Selection of participants: All the health care staff who were willing to co-operate for the study. doctors (300), nurses (132), lab technicians (22) and sanitary staff (30)

Methods of measurement: Data was collected using a pretested structured questionnaire, informal consultations and a walk through survey in the hospital after an informed consent from the study subjects.

The questionnaire was developed after literature review to suite the study population and was pretested and validated by pilot survey of 50 people with representations from all the four categories.

The questionnaire consisted of 10 questions to assess the knowledge having yes/no/not sure responses, 4 questions on attitude having agree/disagree/no comment as responses and 6 questions on practices having yes/ no responses.

Data collection and processing: Data was collected by forming a survey team of 3 members who were trained and standardised especially for informal consultations to ensure internal validity. The data forms were scrutinized for missing values, entered and analysed using open epi version 2.

Statistical methods: Chi-squared test is used to test the statistical significance of the differences observed across all the four categories of health care workers.

RESULTS

The overall response rate was 91% (441 out of 484)

The study showed gaps in the knowledge of all the four categories of respondents (Table 1).

The knowledge of the existence of the BMW Management Rules 1998 was

better in doctors(68.5%) than in the other categories, none of the sanitary staff were aware of BMW rules. A majority of the nurses (73%) could identify the biohazard symbol unlike others. The doctors had better knowledge about all the aspects of BMW management compared to other categories except the knowledge of disposal of sharps in blue coloured puncture proof containers (31%) in which other categories had better knowledge. Only 16% of the sanitary staffs were aware of the diseases transmitted by BMW.

Table 1: Knowledge of the health care workers regarding management of BMW

	Doctors N=280	Nurses N=115	Lab technicians N=22	Sanitary staff N=24	Total N=441
Awareness regarding existence of biomedical waste management rules	192 (68.5%)	52 (45.2%)	6 (27.2%)	1 (4%)	251 (56.9%)
Awareness regarding existence of waste management plan in the institution	119 (42.5%)	61 (53%)	2 (9%)	4 (16.6%)	186 (42.1%)
Identification of biohazard symbol	143 (51%)	84 (73%)	7 (31.8%)	6 (25%)	240 (54.4%)
Knows that waste to be segregated into different categories at the source	253 (90.3%)	79 (68.6%)	17 (77.2%)	13 (54.1%)	362 (82%)
Knows the Existence of colour coding for BMW	208 (74.2%)	104 (90.4%)	20 (90.9%)	11 (45.8%)	343 (77.7%)
Knows the Need for disinfection of BMW before disposal	248 (88.5%)	93 (80.8%)	22 (100%)	8 (33.3%)	387 (87.7%)
Knows the Transmission of diseases through BMW	257 (91.7%)	84 (73%)	20 (90.9%)	4 (16%)	367 (83.2%)
Knows that Inappropriate disposal of BMW results in environmental degradation	176 (62.8%)	29 (25.2%)	17 (77.2%)	9 (37.5%)	236 (53.5%)
Knows that blue coloured puncture proof container is for disposal of waste sharps	87 (31%)	95 (82.6%)	11 (50%)	9 (37.5%)	202 (45.8%)
Knows that waste should not be stored > 48hrs	110 (39.2%)	43 (37.3%)	4 (18.1%)	4 (16.6%)	161 (36.5%)

Chi Square= 129.4 : Degrees of Freedom= 27 : p-value=<0.000001

The differences in awareness across the 4 categories of health care workers was statistically highly significant.

Regarding the attitude towards BMW (Table 2), majority of the sanitary staff felt that the management of BMW is not an issue at all and it is purely the responsibility of the institution not individual responsibility. They also felt that the safe management of BMW is an extra burden at work. Majority of the doctors, nurses and lab technicians had the

favourable attitude of willingness to attend a training programme on management of BMW.

Regarding the practices related to BMW management (Figure 1) majority of the nurses and lab technicians had favourable practices than the other groups, particularly the practice of disposing sharps in blue coloured puncture proof containers

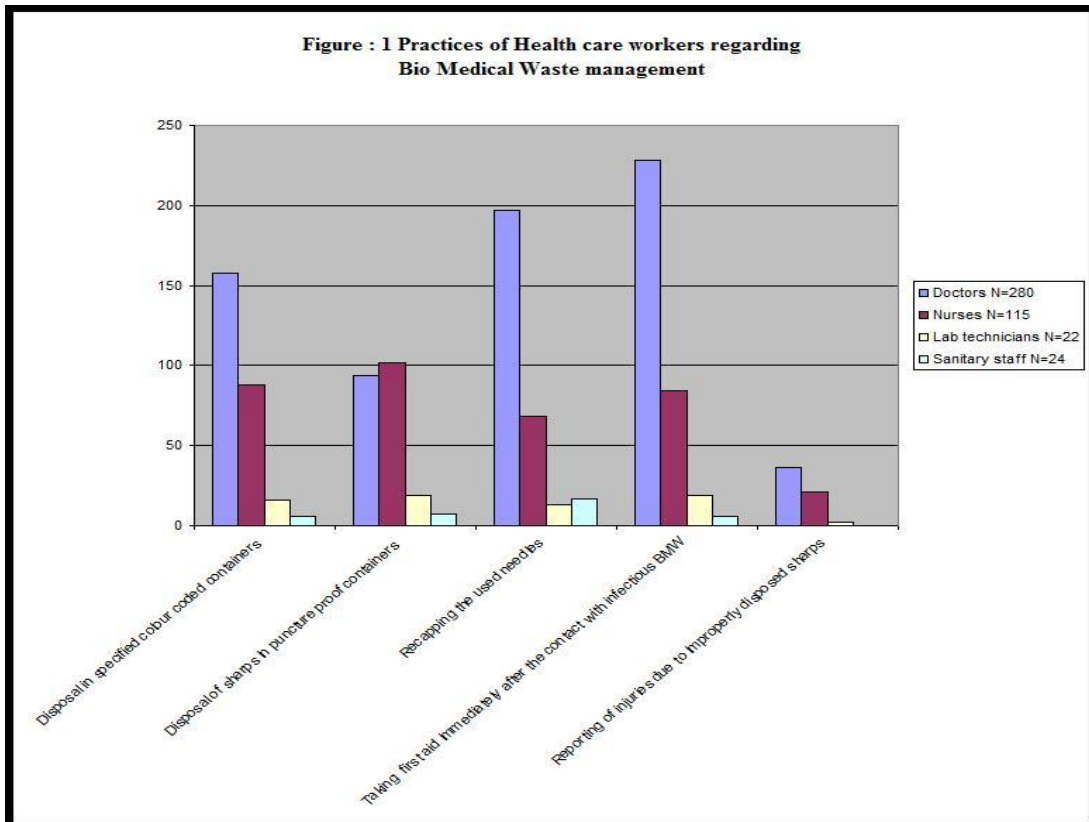
was low among doctors (33.5%). Recapping used needles which is viewed as one of the important risk factors for needle stick injuries was high among all the categories

and highest was among the doctors (70%). However injury reporting was low across all the categories of health care workers.

Table 2: Attitude of health care workers regarding BMW management.

	Doctors N=280	Nurses N=115	Lab technicians N=22	Sanitary staff N=24	Total N=441
Feels that safe management of BMW is not a issue at all	68 (24.2%)	27 (23.4%)	7 (31.8%)	99 (37.5%)	111 (25.1%)
Feels that Safe management of health care waste is the responsibility of the institution and not the individual	82 (29.2%)	31 (26.9%)	5 (22.7%)	18 (75%)	136 (30.8%)
Feels that Safe management of Health Care waste is an extra burden on work.	53 (18.9%)	32 (27.8%)	4 (18.1%)	15 (62.5%)	104 (23.5%)
Likes to undergo a training programme on management of BMW	172 (61.4%)	69 (60%)	17 (77.2%)	2 (8%)	260 (58.9%)

Chi Square= 183.8 ; Degrees of Freedom= 9 ; p-value= <0.0000001



DISCUSSION

This cross-sectional study identified certain deficiencies in the knowledge of various categories of health care workers. The knowledge of doctors was better compared to their practices whereas the reverse was true for nurses and lab technicians. The knowledge was low on all counts among sanitary staff; this was similar to the findings from other studies. ^(4,8) The attitude of sanitary staff towards BMW management was a matter of concern. Low level of knowledge is mainly attributed to poor training facilities and also to relatively low educational level of the sanitary staff. Training of both the technical staff and the nontechnical staff is critical for the proper and appropriate management of biomedical waste. ^(4,6)

The practice of recapping the needles was observed to be high among all the categories (67%) which are one of the important risk factors for Needle stick injuries. ⁽⁵⁾ This may be attributed to lack of awareness also informal consultations revealed lack of adequate number of needle cutters in the hospitals. This could be solved by providing adequate number of needle cutters and strict enforcement of standard operating procedure for safe disposal of used needles in the work environment.

The overall reporting of the injuries was only 13.3% this was because most of the health care workers were unaware about the formal system of injury reporting which was existent in their own institution; this problem could be solved by including these issues in the job description of these employees and by monitoring by the management. Overall 3.1% of the health care workers attended the BMW management training programme outside the institution out of their own interest but around 59% of them expressed their

willingness to attend such a programme if an opportunity is provided.

Training of both the technical staff and the non-technical staff is critical for the proper and appropriate management of biomedical waste. ^(4,6)

CONCLUSIONS AND RECOMMENDATIONS

The present study outlines significant gap in awareness and practices in execution of biomedical waste management rules by the health care workers.

Healthcare waste management should be supported through appropriate education (periodic CMEs) training and the commitment of the healthcare staff, management and healthcare managers. ⁽⁷⁾

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