



Study About Awareness and Practices of Health Care Waste Management among Medical Practitioners and Hospital Staff in a Medical College Hospital, Jabalpur

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ABSTRACT

Background: *Biomedical waste is any waste, which is generated during the diagnosis, treatment or immunization of human beings or in research activities or in the production or testing of biological products. Biomedical waste can be categorized into non-hazardous and bio-hazardous. Approximately 75-90% of the biomedical waste are non hazardous and as harmless as any other municipal waste. The remaining 10-25% is hazardous and can be injurious to humans or animals and deleterious to environment. Inadequate and inappropriate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the environment as well. Hospitals/health care services inevitably create waste that may itself be hazardous to health. The waste produces in the course of health care activities carries a higher potential for injury, infection and pollution due to open burning, than any other type of waste.*

Objective: *The objective was to assess knowledge, attitude, risk perception and practices of doctors, interns, nurses, laboratory technicians, attenders and housekeeping staff regarding biomedical waste management.*

Materials and Methods: *This was a cross-sectional study done in a medical college rural hospital. A total of 128 health personal were included in the study with their prior consent. Study subjects include doctors (18), interns (21), nurses (27), laboratory technicians (15), attenders (26) and housekeeping staff (19).*

Results: *Doctors, nurses have better knowledge than other staff regarding health care waste management. Regarding practices related to health care waste management nurses were better. Knowledge regarding the colour coding and waste segregation at source was found to be better among nurses and laboratory staff.*

Conclusion: *The importance of training regarding health care waste management needs emphasis; lack of complete knowledge about biomedical waste management impacts practices of appropriate waste disposal. Segregation of waste in our hospital is non-satisfactory. And handling of biomedical waste is still a matter of serious concern for health authorities in India.*

INTRODUCTION

The health care services while providing services, curative, promotive or preventive inevitably create

waste which itself may be hazardous to health. Inadequate and inappropriate knowledge of handling of healthcare waste may have serious

health consequences and a significant impact on the environment. It carries a higher potential for infection and injury than any other type of waste. It is estimated that annually about 0.33 million tonnes of hospital waste is generated in India and, the waste generation rate ranges from 0.5 to 2.0 kg per bed per day¹. Wherever, generated, a safe and reliable method for handling of biomedical waste is essential. Effective management of biomedical waste is not only a legal necessity but also a social responsibility. In developing countries like India the waste is carried to the outskirts of the city and dumped in the most insanitary way.

The public concern about the medical waste management has increased largely in the past few years on a global basis and a significant effort has been directed toward proper and safe management of hazardous medical waste². However, as there is not yet clear understanding of the risk, and as consequence, inadequate management practices are often implemented. The absence of proper waste management, lack of awareness about the health hazards from biomedical wastes, insufficient financial and human resources, and poor control of waste disposal are the most critical problems connected with health care waste. The hospital waste management has diverse ramifications as it not only affects the health of the patients but also of health care workers (doctors, nurses, attenders and housekeeping staff etc.) and general public. In addition good waste management in a hospital depends on good medical waste management team, good administration, careful planning, sound organization, underpinning legislation, adequate financing, and full participation by trained staff³.

Waste handling and disposal is often considered only the job of class IV worker. These workers are

rarely provided with pre- immunization or training. Adequate knowledge about the health hazard of hospital waste, proper technique and methods of handling the waste, and practice of safety measures can go a long way toward the safe disposal of hazardous hospital waste. With this background, this study was conducted with the main objective of assessing knowledge, attitude, and practices of doctors, nurses, laboratory technicians, and other staff regarding health care waste management.

MATERIALS AND METHODS

After taking approval of ethical committee on 128 subjects this cross-sectional study was carried out in a medical college hospital in Jabalpur . The study subjects comprised of interns, doctors, nurses, laboratory technicians, attenders and housekeeping staff. The study period was from October 2016 to January17. They were interviewed and observed for health care waste management practices. These interviews and observations were conducted on a predesigned and a pretested questionnaire and checklist. At the end of the study training was given regarding the same. The data was collected and analysed using proportions.

RESULTS

Present study done in a hospital in rural parts of Jabalpur.

In the present study a total of 128 subjects were interviewed. The composition was as follows interns (19%), doctors (12.6%), nurses (21.7%), laboratory technicians (10%), attenders (21.9%) and housekeeping staff (14.9%).

Table 1: Respondent's knowledge and awareness regarding clinical waste management

Awareness and knowledge questions	Description	Percentage (%)
Do you know about clinical waste management process in the hospital	Yes	93
	No	7
	Total	100
Can clinical waste cause risks and health hazards to your health when infected	Yes	99
	No	1
	Total	100
How many categorises of clinical waste in hospital	1	4
	2	22

	3	40
	4	3
	5	5
	6	6
	More than 10	3
	Do not know	17
	Total	100
Do you think clinical waste management in the hospital is following the correct procedure	Yes	81
	No	19
	Total	100
Can clinical waste cause risks and adverse health effects to the environment when not handling property	Yes	99
	No	1
	Total	100
Are bags and containers for clinical waste marked with the international symbol	Yes	92
	No	8
	Total	100
Do you segregate general waste from clinical waste	Yes	99
	No	1
	Total	100
Do you know the correct method of handling clinical waste based on the categories	Yes	78
	No	22
	Total	100
Are clinical waste containers or bag holder been put in all locations where particular categories of waste may be generated	Yes	81
	No	19
	Total	100
What is the amount of infectious waste that should be thrown in the container	Less than ¾ full	77
	More than ¾ full	5
	1/2full	3
	Do not know	15
	total	100
Do you know about the color coding for waste generation	Yes	91
	No	9
	Total	100
What is the color of the clinical waste bin	Black	6
	Yellow	92
	Blue	2
Do needle stick and sharp injuries need to be reported	Yes	95
	No	5
	Total	100
Are clinical waste collected daily (or as frequently as required) and transported to designated central storage site?	Yes	95
	No	5
	Total	100
Do you use personal protective equipment in handling clinical waste	Yes	87
	No	5
	Total	100
Do you know if the hospital uses a wheelie bin or trolley for internal transport	Yes	94
	No	6
	Total	100
Do you know if the hospital has a set of transport schedule for infectious waste within the organization	Yes	93
	No	7
	Total	100
Do you know if the hospital must have standard storage room for keeping hospital infectious waste	Yes	92
	No	8
	Total	100
Do you know if the storage time for infectious waste is 24-48 hours	Yes	66
	No	34
	Total	100
Do you know if the hospital storage room has good lighting and ventilation	Yes	74
	No	26
	Total	100
Do you know where is the location of the storage area of clinical wastes in the hospital	Yes	78
	No	22
	Total	100
Do you know who is the responsible to manage clinical wastes in the hospital	Yes	83
	No	17
	Total	100
Do you know if the hospital has an incinerator for treatment and disposal of infectious waste	Yes	28
	No	72
	Total	100

99% of the study subjects agreed that hospital waste should be segregated and needs to be disposed properly. Totally 83% study subjects knew about categories and the treatment of health care waste (HCW) correctly, of which 79.9% were nurses, (76.8%) were doctors, (38.5%) were interns, (28.3%) were technicians and (19.3%) were housekeeping staff. Majority of the study subjects (95.8%) had knowledge about various health problems caused by health care waste, of which 38.8% were nurses. Only 6 (4%) study subjects knew about categories of health care waste.

Out of the total 128 subjects 86% agreed it should be segregated at the point of waste generation. Out of the total study subjects 10% thought proper disposal of waste should totally be responsibility of the government. And 9.9% of the study subjects considered it an unnecessary extra work burden on the hospital staff. Majority 95% were aware of the color coding for waste segregation but they did not have any clear idea of what should be disposed in which bin.

It was observed in the present study that the knowledge and practices in doctors and nursing staff was good. The attitude of the study subjects toward separation of infectious and non-infectious waste, proper disposal and implementation of rules was positive. Majority 84% were in favour of implementation. Only 62% study subjects committed that they will co-operate in hospital waste management team. The attitude of attenders and housekeeping staff was found to be almost similar. Most of them thought it is an extra amount of work and were not very keen in implementing and attending training programs. The nurses (91.5%) had a better attitude toward separation of wastes, proper disposal, implementation of rules and co-operation in programs.

Table 2: Knowledge about the health care waste categories and its treatment

Study subjects	Total	Aware (%)
Doctors	56	43(76.8)
Interns	65	25(38.5%)
Nurses	83	79(65.57%)
Technicians	44	28.3(12.45%)
Attenders	78	23(29.5%)
Housekeeping staff	57	11(19.3%)

DISCUSSION

Study conducted using a pretested questionnaire and a cross sectional study design was selected. Health care waste management needs systemic efforts. It requires and mandates participation of all. The responsibilities should not lie with the civic body alone. The civic body can act as a coordinating agency and provide support. There is must to be done where the waste is generated. The activities include reduction of waste generated, segregation, decontamination of infected waste, proper containment of waste; secure transportation of the waste, occupation health and safety measures and by creating awareness.

Around 52% participants agreed that they have awareness regarding biomedical waste management and handling rules 1998. Knowledge about biomedical waste management rules among the technically qualified personal like the doctors, nurses and laboratory staff was satisfactory but was low among the attenders and housekeeping staff.

Similar to the study Suwarna Madhukumar et al., interns were included in the survey. It was surprising that though the interns had knowledge but the attitude and practices was not satisfactory. Knowledge about color coding of containers, and waste segregation which is most important pivotal point and crucial for further waste management, was also found to be better among the doctors and nurses as compared to that of the other staff. Low level of knowledge among others is mainly attributed to poor training facilities and also to relatively low education among staff. Training of both the technical staff and the nontechnical staff is critical for the proper and appropriate management of biomedical waste. Similar findings were found in other studies too^{4,5,6}. It was also found that in the present study the nurses had significantly positive attitude when compared to the technicians and the housekeeping staff in one of the study, it was found that 98% of the nurses and 79% of the housekeeping staff had a positive attitude while only 59% of the technical staff had a positive attitude⁵. It was found that the nurses

practiced hospital care waste management better than the technical and housekeeping staff.

At Jhansi it was found that the process of segregation, collection, transport, storage and final disposal of infectious waste was done in compliance with the standard procedure. It was also found that the non-infectious waste was collected separately in different containers and treated as general waste⁵.

In Chandigarh, the medical establishments in the rural area and smaller ones in the urban area dispose off their biomedical waste along with municipal solid waste and no waste management system exists⁷. In one of the district in Gujarat, there was no effective waste segregation, collection, transportation and disposal system at any hospital⁵. In Karachi, it was observed that 25% hospitals were segregating sharps, pathological waste, chemical, infectious, pharmaceutical and pressurized container at source⁸.

Similar to Suwarna Madhukumar et al. the practice of reporting injuries resulting from improperly disposed biomedical waste was found to be completely absent among the staff. Stein et al. in their study reported that among doctors and nurses, only 37% reported that they ever suffered needle stick injury⁹. 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.

CONCLUSION

Lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal. The nurses comparatively were having better knowledge and attitude, and also practiced HCW management better than the housekeeping staff. Regular training of nursing, technical and housekeeping staff should be done and system of monitoring should be evolved. It shall be the duty of every occupier of a health care setting generating biomedical waste which includes a hospital,

nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment.

Following recommendations are proposed:

- 1) It should be ensured that the injuries happening to the healthcare personnel are reported to the person in-charge of biomedical waste management or to the biomedical waste management committee, and they report it in the prescribed format to the pollution control board.
- 2) Training of non technical and housekeeping staff should be specially emphasized.
- 3) Strict implementation biomedical waste management rules
- 4) It should be made compulsory for health care facilities to get their healthcare personal trained from accredited training centres.

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