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Original Research Article

Study of knowledge, behaviour and practice of biomedical waste among health personnel

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ABSTRACT

Background: Healthcare wastes are of great importance due to its hazardous nature. As World Health Organization (WHO) indicated, some of healthcare wastes are considered the most hazardous and potentially dangerous to human health and pollute the environment. With this background this study was undertaken to assess awareness, behavior and practices healthcare personnel about biomedical waste, its hazards and management.
Methods: This one cross-sectional study was conducted at S.V.B.P. hospital associated with L.L.R.M. medical college, Meerut. A total of 291 healthcare personnel who consented for interview were interviewed biomedical waste management rules and observed for biomedical waste management practices by using redesigned and a pretested questionnaire. The data was analysed by using SPSS software.
Results: Awareness regarding bio-medical waste management rules was 67% in doctors, 60% in nurses, 57% among lab technicians, but the sanitary staff was not aware about this. Awareness about category of BMW, number, colour coding, disposed content, labelling and cover of waste containers and segregation of waste were more among nurses and lab technicians in comparison to doctors but minimum among sanitary staff. All the respondents (100%) doctors, nurses and lab technicians knew that HIV and Hepatitis B transmitted through Bio medical waste but their awareness regarding Hepatitis C and other diseases was very low. 74% of sanitary Staff did not know that these diseases could be transmitted through bio medical waste.
Conclusions: Healthcare facilities should get their healthcare personnel trained from accredited training centers.

Keywords: Biomedical waste, Awareness, Doctor, Practices

INTRODUCTION

Lack of awareness about the adverse effects of the garbage and filth generated by hospitals on human body and environment exists in the general population.[1] "Bio-medical waste" is defined **as** any solid, fluid and liquid waste, including it's container and any intermediate product, which is generated during the diagnosis, treatment or immunisation of human being or animals, in research pertaining thereto, or in the production or testing of biological and the animal waste from slaughter houses or any other similar establishment.[2]

According to World Health Organization (WHO), some of healthcare wastes are considered the most hazardous and potentially dangerous to human health and pollute the environment.[3-6] Infectious wastes, particularly, have been responsible for most of the health problems reported among exposed healthcare workers (HCWs), patients, clients and the community for blood borne pathogens unless proper care is taken on healthcare waste management.[3-5]

Hospital acquired infection, transfusion transmitted diseases, rising incidence of Hepatitis B, and HIV,

increasing land and water pollution have led to increasing possibility of catching many diseases. Air pollution due to emission of hazardous gases by incinerator has compelled the authorities to think seriously about hospital waste and the diseases transmitted through their improper disposal. The Central Government had to intervene for enforcing proper handling and disposal of hospital waste and an act was passed in July 1996 and bio-medical waste (handling and management) rules were introduced in 1998.[1] In the preceding time, there has been an increase in public concern about the risks associated with healthcare wastes on a global basis and many efforts have been directed to raise awareness of HCWs about the risk associated with healthcare wastes, particularly, infectious wastes by different organizations.[7] With this background this study was undertaken to assess awareness, behavior and practices healthcare personnel about biomedical waste, its hazards and management.

METHODS

A cross-sectional study was conducted at S.V.B.P. hospital associated with L.L.R.M. medical college, Meerut during October-December, 2012. S.V.B.P. hospital has 1300 bed capacity, study participant include health personnel working in the various department of hospital. All healthcare personnel who consented to participate in the study were included and those who refused to participate were excluded. A total of 291 healthcare personnel consented for interview which included 100 doctors, 59 nurses, 30 laboratory technicians, and 102 sanitary staff, who were interviewed biomedical waste management rules and observed for biomedical waste management practices. These interviews and observations were conducted on a predesigned and a pretested questionnaire and checklist. The data collected and analyzed after entered into Microsoft Excel sheet.

RESULTS

In the present study a total of 291 subjects were interviewed. Awareness regarding bio-medical waste management rules was 67% in doctors, 60% in nurses, 57% among lab technicians, but the sanitary staff does not aware about this. Awareness about category of BMW, number, colour coding, disposed content, labeling and cover of waste containers and segregation of waste were more among nurses and lab technician in comparison to doctors but minimum among sanitary staff. Almost all the respondents (100%) doctors, nurses and lab technicians know that HIV and Hepatitis B transmitted through Bio medical waste but their awareness regarding Hepatitis C and other diseases is very low. 74% of sanitary Staff does not know that these diseases can be transmitted through bio medical waste (Table 1).

Table 1: Awareness regarding bio-medical waste in relation to BMW management and disease transmission (multiple response).

Awareness		Doctor (%)	Nurse (%)	Lab technician (%)	Sanitary staff (%)
Biomedical waste management rules		67	60	57	-
Category of biomedical waste	a) 1-4	50	85	80	10
	b) 1-6	13	5	15	-
	c) 1-10	37	10	5	-
Number of waste container	a) <4	14	2	5	29
	b) 4	73	97	95	9
	c) Don't know	13	1	-	62
Color coding of waste containers		90	92	95	10
What should be disposed in which container	a) Known	23	87	83	8
	b) Not known	77	13	17	82
Segregation of waste into infected/non infected		91	97	95	20
Waste container covered with lid		91	99	99	13
Waste container labeled with department name		77	92	80	6
Disease transmitted through contact of health care waste	a) HIV	100	100	100	43
	b) Hepatitis B	100	100	100	13
	c) Hepatitis C	87	56	55	3
	d) others	31	23	48	-
	e) Don't know	-	-	-	74

Table 2 shows majority of doctors (92%), nurses (96%) and lab technician (96%) agree that waste management is team work and disagree that BMW management is not an issue. They also disagree that waste management increase financial burden on hospital or it is extra burden of work.

Table 3 shows 11% Doctors, 3% nurses, 8% lab technicians and 35% sanitary staff disposed of used syringes and needles into ordinary bag or container without recapping, only 26% doctors threw into puncture proof container with capping, but 89% nurses, 84% lab

technicians practises this, this is because doctors have extra burden of work, 34% doctors, 66% nurses, 67% Lab Technicians destroy syringes and needles after cutting but 83% of Sanitary Staff don't know regarding these practices. Blood socked dressings has to be thrown into coloured coded container by doctors, nurses, lab technicians and sanitary staff were 71%, 85%, 89% and 8% respectively. 46% doctors, 57% nurses, 63% lab technicians and 3% sanitary staff decontaminate sharp and plastic waste by chemical methods. Segregations of waste at the point of generation was more among nurses 79% and lab technicians 83%. Practices for precautions while handling of hospital waste were poor among sanitary staff, 75% Sanitary Staff does not know that precaution should be taken during handling of hospital waste. Regular medical checkups were poor among all categories. Vaccination coverage for hepatitis-B and tetanus was minimum among sanitary staff it was 12% and 23% respectively.

Table 2: Behaviour of health personnel.

Behaviour		Doctor (%)	Nurse (%)	Lab technician (%)	Sanitary worker (%)
Safe management of healthcare waste is not an issue.	a) Agree	-	-	-	-
	b) Disagree	90	96	94	15
	c) No comment	10	4	6	85
Safe management of healthcare is the responsibility of government	a) Agree	40	60	59	22
	b) Disagree	50	33	23	12
	c) No comment	10	7	18	66
Waste Mx is team work/no single class of people Is responsible for safe management	a) Agree	92	96	96	54
	c) Disagree	-	-	-	-
	d) No comment	8	4	4	46
Safe management efforts by hospital increases financial burden on hospitals management	a) Agree	23	13	34	-
	b) Disagree	67	78	62	34
	c) No comment	10	9	4	66
Safe management of healthcare waste is an extra burden of work	a) Agree	10	35	23	33
	b) Disagree	90	50	60	10
	c) No comment	-	15	17	57

Table 3: Practices of BMW management among health personnel (multiple response).

Practice		Doctor (%)	Nurse (%)	Lab technician (%)	Sanitary staff (%)
Destroy syringes & needle					
a) Thrown into puncture proof container without recapping		60	22	12	-
b) Thrown into ordinary bag/container without recapping		11	3	8	35
c) Thrown into puncture proof container with capping		26	89	84	5
d) Destroy after cutting		34	56	67	7
e) Don't know		-	-	-	83
Destroy blood soaked Dressing body parts					
a) Left bed side		-	8	-	49
b) Thrown into color Coded yellow/red container		71	85	89	8
c) Don't know		10	2	1	77
Decontaminate sharp and plastic waste	By chemical	46	57	63	3
	By Autoclave	35	43	53	1
	Not done	31	5	9	45
Segregate waste at point of generation to infection/non-infection/garbage/sharp/needles		23	79	83	33
Precaution taken while handling of hospital waste	a) Wearing gloves	90	94	96	24
	b) Wearing apron	21	13	19	-
	c) Wearing mask	52	33	23	5
	d) Don't know	-	-	-	76
Take regular medical check up		3	15	4	-
Vaccination done	Hepatitis B	87	65	63	12
	Tetanus	100	87	91	23

DISCUSSION

Knowledge about biomedical waste management rules among the technically qualified personnel like the doctors, nurses, and laboratory technician was satisfactory but was low among the sanitary staff. This was similar to the findings from the studies conducted by Joseph et al and Mathur et al.[8,10] The lack of awareness among the sanitary staff in our study about exact colour coding of different categories of biomedical waste, maximum storage time related to biomedical waste management is a matter of concern. The study by Joseph et al revealed that focused training, strict supervision, daily surveillance, audits inspections, involvement of hospital administrators and regular appraisals are essential to optimise the segregation of biomedical waste.[11] In a recent study by Mane et al, health care workers had satisfactory level of knowledge, favorable attitude and better practices towards biomedical waste management. However, their practices were not in proportion to the level of their knowledge and attitude. This is similar to our study findings. Training and duration of work experience were not significantly associated with knowledge, attitude and practice scores, except for nurses with longer work experience, who were more likely to have satisfactory knowledge about waste disposal than less experienced nurses in Cairo.[13] Training of health care workers should be conducted at the regular interval, so that knowledge, attitude and practices of HCWs on BMW management are maintained and quality of patient care is improved.[14] Ongoing monitoring of HCW practices at the hospital is also essential to ensure best management practices, and to create safe working conditions for staff, visitors and the environment.[15]

CONCLUSION

HCW management needs systemic efforts. It requires and mandates participation of all. The activities include reduction of waste generated, segregation, decontamination of infected waste, proper containment of waste; secure transportation of the waste, occupational health and safety measures and by creating awareness Practical implications related to the matter should also be covered.

Following recommendations are proposed: (i) strict implementation of biomedical waste management rules (ii**)** it should be made compulsory for healthcare facilities to get their healthcare personnel trained from accredited training centers. These training sessions should not become merely a one-time activity but should be a continuous process depending upon the patient input in different healthcare facilities, (iii) training of sanitary staff should be specially emphasized, and (iv) 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.

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