

## To Study the Knowledge, Attitude and Practices of Staffs at several levels on Biomedical waste Management at RIMS Ranchi: Hospital Based Cross-Sectional Study

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### Abstract:

**Background:** According to Biomedical waste(Management and handling ) Rules, 1998 of India Biomedical waste means any waste which is generated during Treatment, Diagnosis or Immunization of Human beings or Animal or In research Activities pertaining there to or in the production or in testing of Biological.

**Aims and Objectives:** 1)To Asses the Knowledge of all health personnel involved in the Biomedical Waste Management .2) To know the Attitude of all health personnel involved in Biomedical Waste management .3) To Asses the practices of all health personnel involved in Biomedical Waste Management.

**Methodology:** Descriptive, Cross sectional study was conducted in Anatomy, Biochemistry, Pathology, Microbiology, surgery, Medicine, Orthopaedics, paediatrics, and Gynaecology Department of RIMS, Ranchi. Data on variables like age, sex religion, marital Status, occupation was taken. In our study all health personnel of BioMedical Waste management were included .Pre-tested , Semi-structured questionnaires were put forward to all the health personnel after their consent.

**Statistical Analysis:** Template generated in MS Excel Sheet and analysis was done in SPSS software.

**Results:** out of 165 health personnel surveyed majority were Doctors (40.60%), Nurses (25.45%), Laboratory technician(18.78%)and sanitary Staffs (15.15%).

**Conclusion:** Staffs have got positive attitude and not good practice due to lack of knowledge.

**Key Words:** Biomedical Waste, Biomedical waste management (BMW), Biomedical Waste disposal,

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### I. Introduction

According to Bio-medical waste (Management and Handling) Rules, 1998 of India Bio-Medical waste means any waste which is generated during diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining thereto or in the production or testing of biological . Biomedical waste (BMW) is generated in hospitals, research institutions, health care teaching institutes, clinics, laboratories, blood banks, animal houses and veterinary institutes [1] .Hospital waste management means the management of waste produced by hospitals using techniques that will check the spread of diseases [2] .In developing countries, awareness regarding hospital waste management in terms of its segregation, collection, storage, transportation and disposal is lacking [3,4] Studies in Pakistan show that around 2.0 kg of waste/bed/day is produced out of which 0.1- 0.5 can be categorized as risk waste.[5] .hospital waste generation has become a prime concern due to its multidimensional ramifications as a risk factor to the health of patients, hospital staff and extending beyond the boundaries of the medical establishment to the general population[6].The study applies to all those who generate, collect, receive, store, transport, treat, dispose or handle bio-medical waste in any manner.

Lack of awareness and inadequate and inappropriate knowledge has led to the hospitals becoming a hub of spreading diseases rather than working towards eradicating them..It is estimated that annually about 4,05,702kg/day of waste is generated in India and only 2,91,983kg/day is segregated .Thus, about 28% of waste is not segregated in India.

The main focus of professionals is on the curative aspect of the patient care services, neglecting the importance of proper disposal of biomedical waste. Thus, there is a definite gap between knowledge, attitude and practice.

### II. Aims And Objective

- 1.To assess the knowledge of all health personnel involved in biomedical waste management.
- 2.To know the attitude of all health personnel involved in bio-medical waste management.
- 3.To assess the practice of all health personnel involved in biomedical waste management.

### III. Material & Method

This study is conducted in rajendra institute of medical science ,Ranchi from 15 february 2015 to 15 august 2015.it is the one of the tertiary care centre medical college of jharkhand .It was a descriptive observationa lhospital based cross sectional study. Study participants included the resident doctors intern doctors, nursing staff,sanitary staff and laboratory technician. The study was conducted by using pretested, semi- structured Performa . The study included details of various socio-demographic variables, like age, sex, educational status , working experience, type of work, and other details regarding knowledge, attitude and practice for bio medical waste handling and its management.. Total 165 health care personnal participated in the present study. It included 67 resident doctors and interns, 42 nurses, 31 laboratory technicians , and 25 sanitary staff. Stratified random sampling method was used and the criterion was to use a minimum of 50% of the staff in each strata for the study. Informed consent was obtained from the study participants and ethical clearance was obtained from the institute ethics committee. The data was coded and double checked into a work sheet on Microsoft excel 2013. Data compilation and analysis was done using software SPSS 20 version. Proportions and percentage were used to interpret the result.

### IV. Results

The study is conducted in total 6 months from 15 february 2015 to 15 august 2015. Total 165 health personnal participated in present study. The study participants included age range of 20 to 50 years. Majority of study participants belongs to 25-30 years 51 (30.90%). Majority of participants working in hospital from 10 to 20 years.. majority of parcipants were male. 57.57%. basic profile of health personnal is showed in( table 1).many questionnaire regarding knowledge of bmw of health personnal is asked. Regarding this all data is shown in( table 2). Awareness about bio medical waste management and other particulars related to BMW act, handling and management were presented in (table 3) . Detailed information was collected regarding practice of BMW handling and management (table 4). Details regarding record of BMW, disinfection at work place, use of personal protective measures for handling, storage facility, availability of hub cutter, practice regarding different categories disposal were collected from the healthcare personnal. The study showed that 91% of staffs had the knowledge regarding biomedical waste management. Among them only 59.39% participantent know the BMW act and 53.33% participantent received the BMW training in the institute. The biomedical waste is generated by various sources but only 76.67% staffs knew about all the sources while rest of the staffs had inadequate knowledge.90.30% staffs knew about the colour coding but only 50.90% of them had identified all the four colour coded bags used for biomedical waste management.

With respect to the attitude regarding the waste management, majority felt that it is a team work and all are responsible for safe disposal. Only 41 %doctors attitude towards the fact that safe management of healthcare waste is an extra burden on work. Majority of doctors accepted waste management is part of their responsibility.

In spite of having knowledge and attitude, only 63.03% staffs keep colour coded dustbins in their wards. Although it is not significant  $p < .05$  (  $p$  value =0.542,  $df = 1$  ,chi square value = 0.372) .67.9% staffs do not practice proper waste disposal in their wards. 81.21% health personnel disinfected biomedical waste before disposal at work place. it is statistically significant because  $p < .05$  (  $p$  value =0.000 ,  $df = 1$  , chi square value = 14 .27).majority of participantent in our study practices personal protective measures while handling biomedical waste, and it is also statistically significant  $p < .05$  (  $p$  is .007,  $df$  is 1 ,chi square value = 7.306).

**Table : 1 Basic profile of study population of healthcare personnal**

Characteristics		Number	Percentage
1.Age	20-25 years	48	29.09%
	25-30 years	51	30.90%
	30-35 years	14	8.48%
	35-40 years	18	10.90%
	> 40 years	34	20.60%
2.Sex	Male	57.57%	
	Female	42.42%	
3.Working status	Doctors	67	40.60%
	Nurses	42	25.45%
	Laboratory technician	31	18.78%
	Sanitary staffs	25	15.15%
4.Working in hospitals since	<10 years	11	6.66%

	10-20 years	101	61.21%
	20-30 years	23	13.93%
	>30 years	30	18.18%
5.Received any training for BMW management			
	Yes	88	53.33%
	No	77	46.66%

**Table 2: Knowledge about Bio Medical Waste (BMW) and its management among health care personnel**

	YES	NO
Knowledge	n(%)	n(%)
1.Heard about Bio Medical Waste (BMW)	151(91.51)	14(8.48)
2.Heard about BMW Rule/Act, 1998	98(59.39)	67(40.60)
3.Received any training for BMW management	88(53.33)	77(46.66)
4.Know about Bio Hazard Symbol	61(36.96)	104(63.03)
5.Is present hospital generates BMW.	121(73.33)	44(26.66)
6.Know all BMW management categories	80(48.48)	85(51.51)
7.knowledge about incineration	71(43.03)	94(56.96)
8.Any health hazard associated with BMW	161(97.57)	4(2.42)
9.Is BMW transmits any disease	121(73.33)	44(26.66)
10.Are different coloured bags used to dispose BMW	149(90.30)	16(9.69)
11.Identified all coloured bags used for BMW collection	84(50.90)	81(49.09)
12.Identified methods for BMW management	77(46.66)	88(53.33)

**Table 3: attitude regarding biomedical waste management**

Serial no	Questions regarding attitude on biomedical waste management	Doctors	Nurses	Laboratory technician	Sanitary staffs
		n=67	n=42	n=31	n=25
		n(%)	n(%)	n(%)	n(%)
1	Showing attitude of people towards the facts that safe management of healthcare waste is an important issue.	67(100)	39(92.85)	30(96.77)	25(100)
2	Showing attitude of people towards the fact that waste management is a teamwork	67(100)	41(97.61)	29(93.54)	25(100)
3	Showing attitude of people towards the fact that safe management of healthcare waste is an extra burden on work.	28(41.79)	10(23.80)	8(25.80)	12(48)
4	Waste management is a part of my responsibility	65(97.01)	39(92.85)	27(87.09)	24(96)

**Table 4: Practice of health care personnal regarding Bio Medical Waste (BMW) and its management**

	Yes	NO	Degree of freedom (df)	P value	Chi square value
	no in %	no (%)			
1.practice of keeping colour coded dustbins in their wards	104(63.03)	61(37)	1	.542	.372
2.practice of proper waste disposal in their wards.	53(32.12)	112(67.9)	1	.715	.133
3.Maintaining BMW records at work place	111(67.27)	54(32.7)	1	.424	.639
4.Disinfection of BMW done before disposal at work Place	134(81.21)	31(18.8)	1	.000	14.27
5.Personal protective measures procured for handling BMW	129(78.18)	36(21.8)	1	.007	7.306
6.Proper storage facility provided for collecting BMW at work place	137(83.03)	28(17)	1	.192	1.699
7.Provided with hub cutter for needles and syringes	136(82.42)	29(17.57)	1	.004	11.20
8.Know the place where BMW treated	75(45.45)	90(54.54)	1	.066	3.379
9..Practicing correct method for collecting used disposable plastic items	135(81.81)	30(18.18)	1	.109	2.569
10.Practicing correct method	102(61.81)	63(38.2)	1	.238	1.391
11.Practicing correct method for collecting sharps and Needles	98(59.39)	67(40.6)	1	.751	.100
12.Practicing correct method for collecting human anatomical waste	113(68.48)	52(31.5)	1	.234	1.418

## **V. Discussion**

A cross sectional study was conducted on several level of staffs at Rajendra institute of medical sciences, Ranchi. A total of 165 health personnel participated in the study (67 doctors, 42 nurses, 81 lab technicians, sannitary staffs). The waste generated during the delivery of health care services carries a high potential of .infection and injury than any other type of waste and 10- 25% of them are infectious in nature. Majority of participants don't have knowledge about bio hazard symbol. but majority of health personnel accepted bio medical waste transmits disease. 92.85% participants in our study accepted safe management of healthcare waste is an important issue. only 81.81% participants practicing correct method for collecting used disposal plastic items, while only 61.81% practicing correct methods of bio medical waste management. 90% participants have knowledge of different colours bag used to dispose biomedical waste. And among them only 61% practicing correct method.

All of the staffs under study knew about infection with HIV, Hepatitis B & C for which there is strong evidence of transmission via healthcare waste. Majority of staffs think that there is lack of manpower for proper waste disposal in the hospital.

## **VI. Conclusion:**

This study shows that there is lack of knowledge regarding segregation and colour coding of waste among different staffs of Rajendra institute of medical sciences, Ranchi. It also reveals that enough precautions are not been taken for proper biomedical waste management. The staffs have got positive attitude and not a good practice due to lack of knowledge. Further intervention can be done by providing training programmes, so that the knowledge on biomedical waste management can be improved. Constant supervision and implementation at each level of waste management is needed. If we need to protect our environment and health of community we must sensitize and motivate ourselves to this important issue not only in the interest of staffs but also in the interest of community.

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