

# Study Of Knowledge, Attitude And Practices Regarding Biomedical Waste Management Among Healthcare Personnel In Gazipur, Bangladesh

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## **Abstract**

*Background: Biomedical waste is known as the second dangerous waste in the world that needs to be properly managed. Inadequate and improper technique may cause serious health hazard and environmental pollution. The study aimed to determine the status of knowledge, attitude and practices regarding biomedical waste management among healthcare personnel of Bangladesh.*

*Methods: A cross sectional study was carried out in Gazipur Sadar Hospital of Bangladesh. Total 91 randomly selected healthcare personnel including 22 doctors, 45 nurses, 10 attenders and 14 housekeeping staffs were interviewed.*

*Results: The results showed that poor knowledge level among healthcare personnel excluding doctors. Besides, no black colour coding bin was found in the hospital. Regarding practices and attitude related with waste management, housekeeping staffs ignored the standard operating procedures.*

*Conclusion: It can be concluded from the present study that poor levels of knowledge, practices and attitude regarding biomedical waste management in Gazipur, Bangladesh. Lack of adequate knowledge impedes the waste management.*

## **Keywords:**

*Biomedical waste management, Attitude, Knowledge, Practice.*

## **1. INTRODUCTION**

Biomedical waste is categorised as the waste which is generated from diagnosis, treatment, immunisation or research activities (Government of Bangladesh, 2014). Healthcare services of Bangladesh are experienced large number of patient and providing health care facilities every day. As a result, huge amount of wastes generate per day. These wastes are characterised as hazardous and nonhazardous. WHO identifies that 85% biomedical wastes are nonhazardous, 10% biologically hazardous and rest of them are highly hazardous (Uddin et al., 2014). These 15% wastes have higher potential for infection and injury than any other type of wastes. Often these are disposed together with domestic waste which is able to cause serious health impact (Hasan et al., 2008) and environmental pollution. A reliable method for biomedical waste handling is indispensable and management of biomedical waste becomes a social responsibility instead of legal necessity.

Department of Environment of Bangladesh has introduced Medical Waste (Management and Processing) Rules 2008 for proper management of medical waste however, this provision is yet to be implemented properly. The awareness about the law and related workshops are essential to grow responsiveness among the healthcare personnel (Summers, 1991).

In a study, it is found that 36.03% of hazardous wastes are constituted in diagnostic centre and health care providers of Bangladesh (Uddin et al., 2014). Additionally, medical wastes are frequently dumped in bin with other domestic wastes. Moreover, solid and liquid medical wastes are heaped on garbage or drained to nearest drain. Besides, standard operating procedure is often ignored by workers (Hasan et al., 2008). Lack of awareness, inadequate training program, insufficient funds and human resources and poor control of waste disposal are the most crucial problem linked with improper biomedical waste management. This biomedical waste management has diverse ramifications on health of the patients and healthcare workers (doctors, nurses, attenders, housekeeping staffs etc.) (Madhukumar & Ramesh, 2012).

Gazipur district is one of the largest industrial areas of Bangladesh. There are around 0.1 million people reside here. However, there is only one government hospital "Gazipur Sadar hospital" available in this area which providing healthcare facility of denizens of this area (Bangladesh Bureau of Statistics, 2013). The purpose of the study was, therefore, to investigate the knowledge, attitude and practices of healthcare workers of Gazipur Sadar hospital of Bangladesh toward biomedical waste.

## **2. MATERIALS AND METHODS**

A descriptive type of cross sectional study was performed to assess the knowledge level of healthcare workers (doctor, nurse, attenders, housekeeping staffs etc.) of Gazipur Sadar Hospital, Gazipur, Bangladesh. A semi-structured questionnaire was used to collect data. A pre-test was performed and some modification was made accordingly before collecting the final data. The present study was performed from June 2014 to September 2014. 91 randomly selected interviewees from a population of healthcare personnel consented for interview (response rate 91%) which included 22 doctors, 45 nurses, 10 attenders and 14 housekeeping staffs, who were interviewed and observed for the hospital waste management practices. An approval was taken from the hospital authorities for the present study. The data entry interface was designed to check for referential integrity, missing values, and acceptability constraints. Errors identified at any level were referred back to the field for correction.

## **3. RESULT**

Among the participants, 49.5 % of were nurses followed by doctors (24.2%), housekeeping staffs (15.5%) and attenders (10.9%). Demographic information represents that most of the interviewees were female (60.4%) and mean age of the respondents were 31±4. The minimum age of the respondent was 23 and maximum age was 47. 27.4% respondents had less than 5 years of service experience whereas, majority of respondents (45%) had 5-10 years' experience. Demographic information reveals that 56% of respondents were not trained on biomedical waste management. Additionally it explains, only 22.8% respondents completed the post-graduation degree and majority of respondents (58.2%) completed higher secondary degree or 3 years diploma of nursing course. Table 1 illustrates the socio-demographic status of healthcare workers of study area.

Knowledge level data represents that doctors had better knowledge than others (Table 2). 81.8% doctors were familiar with WHO guideline about the biomedical waste management and handline. During the plant tour, no black colour coded waste bin was found in the hospital thus, doctors used conventional bin to serve the purpose. However, this bin was not labelled as per its characteristics. Besides, 40.9% of doctors found to use common bin to dispose the biomedical wastes. However, 36.4% of doctor use proper colour coding bin to dispose the wastes. Poor level of knowledge, attitude and practice noted among housekeeping staffs regarding biomedical waste management.

#### **4. DISCUSSION**

The present study reveals that the knowledge level of doctors and nurses for biomedical waste management is better than other healthcare workers. This result has been supported by the finding of other countries (Janjua, 2003, Mathur, et al., 2011 & Pandit, et al., 2005]. However, no proper segregation, transportation and disposal procedures were noted in recent study. Similar finding was found by various researchers of Pakistan and India (Madhukumar, & Ramesh, 2012 & Kumar, et al., 2013).

81.8% doctors were aware of the proper medical waste management technique. However, majority of respondents (56%) had not received any formal training on biomedical waste management. Similar result was noted by Akther et al (1999) while performed similar type of research among tertiary healthcare workers.

Black colour coding bin was not available in the study hospital. As doctors were trained on biomedical waste management thus, a conventional bin was used by them to separate wastes according to its characteristics. However, no proper labelling was found on this bin. Moreover, knowledge about colour coding for infectious waste management found poor among the lower staff. Uddin et al. (2014) found the similar result in a study at Faridpur hospital.

Personal protective equipment (PPE) was not used by 64.8% respondents while segregating, transporting and disposing the infectious waste. Similarly, use of PPE was found not compliance with standard procedure among the healthcare workers of India while managing biomedical wastes (Madhukumar, & Ramesh, 2012 & Mathur, et al. 2011). Level of educational status is an important factor to improve such condition. Attitude and practices can be improved by providing proper training among the lower level of workers (Kumar, et al. 2013, Mathur, et al. 2011 & Sanjeev, et al. 2014).

#### **5. CONCLUSION**

The practices toward biomedical waste management in Gazipur Sadar Hospital were found noncompliance with standard procedure. A subsequent literature review suggests that this is a common problem in medical centres of underdeveloped country like as Bangladesh. Literature review also suggests that lack of knowledge and training facility lead this problem. Thus, regular monitoring and training require to manage these wastes in proper way.

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Table.1: Socio-demographic characteristics of healthcare workers of Gazipur Safar Hospital, Bangladesh

Socio-demographic character		Doctors (n=22)		Nurses (n=45)		Attenders (n=10)		Housekeeping staff (n=14)	
		N	%	N	%	N	%	N	%
Age	<25	-	-	2	4.5	1	10	3	21.5
	25 - 35	16	72.7	35	77.7	6	60	9	64.2
	>35	6	27.3	8	17.8	3	30	2	14.3
Gender	Male	15	68.2	3	6.6	10	100	8	57.1
	Female	7	31.8	42	93.4	-	-	6	42.9
Highest Educational Status	Post-graduation	5	22.8	-	-	-	-	-	-
	Graduation	17	77.2	4	8.8	-	-	-	-
	Higher Secondary/Diploma in Nursing	-	-	41	91.2	9	90	3	21.4
	Secondary	-	-	-	-	1	10	11	78.6
Department	Medicine	8	36.4	11	24.5	2	20	3	21.5
	Emergency & Operation Theatre	8	36.4	10	22.2	3	30	4	28.5
	Surgery	6	27.2	13	28.8	2	20	2	14.3
	Administrative	-	-	11	24.5	3	30	5	35.7
Work Experience	<5	5	22.7	15	33.3	1	10	4	28.6
	5 - 10	8	36.4	19	42.2	6	60	8	57.1
	>10	9	40.9	11	24.5	3	30	2	14.3
Waste management Training	Trained	22	100	18	40	-	-	-	-
	Not trained	-	-	27	60	10	100	14	100

Table 2: Knowledge, attitude and practices of interviewees of study

Knowledge, attitude and practices variables		Doctors (n=22)		Nurses (n=45)		Attenders (n=10)		Housekeeping staff (n=14)	
		N	%	N	%	N	%	N	%
Knowledge	Segregation of infectious waste	18	81.8	27	60	1	10	2	14.2
	Collection of infectious waste	14	63.6	22	48.8	3	30	4	28.5
	Transportation of infectious waste	13	59.1	24	53.3	2	20	4	28.5
	Disposal of infectious waste	14	63.6	27	60	2	20	3	21.4
Attitude	Throw waste in common bin instead of segregated bin	9	40.9	32	71.1	9	90	11	78.7
	Collection of waste bins	11	50	21	46.6	2	20	10	71.4
	Infectious waste transport	13	59.1	25	55.5	1	10	12	85.7
	Infectious waste responsibility	14	69.6	28	62.2	2	20	9	64.2
Practices	Use of proper colour coding	8	36.4	25	55.5	8	80	0	0
	Use of Personal Protective Equipment	15	68.1	15	33.3	1	10	1	7.1
	Waste collection after every 24 hours	6	27.2	14	31.1	1	10	9	64.2
	Disposal of sharps	8	36.3	17	37.7	2	20	4	28.5