



A Study of Knowledge, Attitude and Practices of Paramedical Workers Regarding Bio Medical Waste Management

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ABSTRACT

Introduction: Biomedical waste management has recently emerged as an issue of major public health concern. Risks of infections in health care settings are very high. Proper handling and disposal of waste is of utmost importance. This study was carried out on paramedical workers in Government Medical College, Kannauj with the aims and objectives of 1. To assess the knowledge, attitude and practices of paramedical workers regarding biomedical waste management 2. To provide suggestive measures if required. Materials and Methods: This was a cross sectional study. We included 100 paramedical workers as per convenience after ethical clearance and taking permission of head of institution. The paramedical workers were interviewed after their consent using structured and validated questionnaires. Results: Knowledge, attitude and practices of paramedical workers were found to be unsatisfactory and an intense need to provide training regarding proper handling of bio medical waste was felt.

KEYWORDS : Knowledge, Attitude, Practices, Biomedical waste, Paramedical workers.

Introduction:

Biomedical waste means “any waste, which is generated during the diagnosis, treatment and immunization of human beings or animals, or in research activities pertaining thereto or in production or testing of biological”. Biomedical waste handling rules were framed by Ministry of Forest and Environment in 1998 and revised in 2011. 10-25 per cent health care waste is regarded as hazardous and may create a variety of health risk.²

Risks of infections in health care settings are very high. Proper handling and disposal of waste is of utmost importance. Bio-medical waste shall be segregated and kept in the color coded containers/bags of non-chlorinated plastics at the point of generation in accordance with the schedule II prior to its storage, transportation, treatment and disposal.

Proper handling of waste prevents nosocomial infection, mis-utilization of left over drugs, environmental pollution and risk of infections outside hospitals for waste handlers. A proper knowledge of handling, segregation at the point of generation and treatment prior to disposal is vital step to prevent these waste hazards. This study was carried out on paramedical workers of Government Medical College, Kannauj, a newly established college of northern districts of Uttar Pradesh with the following **aims and objectives** 1. To assess the knowledge, attitude and practices of paramedical workers regarding biomedical waste management 2. To provide suggestive measures if required.

Materials and Methods:

This was a cross sectional study, carried out in Medical College for 2 months from March 2015 to April 2015. 100 paramedical workers involving staff nurses, lab technicians, pharmacists and ward boys were selected randomly as per convenience. The information from study subjects were taken on background characteristics like age, sex, qualification, occupation and years of experience, their knowledge, attitude and practices regarding biomedical waste management. The information was recorded on predesigned, precoded and pretested proforma for its validity. Approval for study was taken from the ethics committee of the college. Nature of study was explained to respondents. Each respondent was given a unique identifier and personal name of respondent was not used in data analysis. Data was entered on excel sheets and analysed. Descriptive analysis was used as per study requirement.

Annexure I of revised waste handling rule (2011) was used for assess-

ment. According to it various categories are 1; Human anatomical waste, 2; Animal waste, 3; Microbiology and biotechnology waste, 4; waste sharps, 5; Discarded medicine and cytotoxic waste, 6; soiled waste, 7; infectious solid waste and 8 ; chemical waste. Liquid waste should be chemically treated before discharging into drains. Of eight categories of waste 1,2,5 and 6 should be collected in yellow bags, 3,4,7 in red bags/puncture proof container, 8 in blue bags container and municipal waste in black bags.³ The respondents were asked to identify following biohazard and cytotoxic hazard symbol.



Biohazard Symbol



Cytotoxic Hazard

Results:

Table1: Some Background Characteristics of Respondents

S. No	Characteristics	No. (%) N=100
1.	Age (Years)	
	<20	00
	20-24	08 (8%)
	25-29	20(20%)
	30-34	39(39%)
	35-39	19(19%)
	40-44	12(12%)
	>44	02(2%)
2.	Sex	
	Female	66 (66%)
	Male	34(34%)
3.	Education	
	GNM	70 (70%)
	DMLT	16(16%)
	Intermediate	12(12%)
	BA/BSc	01(1%)
	B. Pharma	01(1%)

4.	Occupation	
	Nurse	70 (70%)
	Lab Technician	16(16%)
	Ward Boy	13(13%)
	Pharmacist	01(1%)
5.	Place of Work	
	Ward	57(57%)
	OT	14(14%)
	Casualty	12(12%)
	Laboratory	13(13%)
	OPD	03(3%)
	Blood Bank	01(1%)
6.	Years of Experience	
	1-5	21(21%)
	6-10	68(68%)
	11-15	11(11%)
	16+	-

As per **Table 1** majority of respondents (39%) were in the age bracket of 30-34 years followed by 20-24 years (20%) and 35-39 years (19%). About two-thirds were females. About 87 per cent were professionally qualified, of which 70 per cent were qualified as GNM (General Nurse Midwife), 16 per cent as Diploma in Lab Technology, 1 per cent as B. Phrama. Rest 13 per cent respondents were educated up to intermediate and above. By occupation 70 per cents respondents were nurse, 16 per cent lab technicians, 1 per cent pharmacist and 13 per cent ward boy or girl. 57 per cent respondents were working in ward, 14 per cent in OT, 12 per cent in casualty, 13 per cent in laboratory, 3 per cent in OPD and 1 per cent in blood bank. Regarding experience it was found that most of them (68%) were having an experience of 6-10 years while 21 per cent and 11 per cent were having 1-5 years and 11-15 years of experience respectively.

Table 2: Knowledge of Paramedics regarding BMW Mgt.

S. No	Characteristics	No. (%) N=100
K1.	*According to you, what are BMW?	
a.	Catheter	06(6%)
b.	I/V Line	02(2%)
c.	Cotton	06(6%)
d.	All	92(92%)
K2.	Are all health care waste hazardous?	
	Yes	64(64%)
	No	36(36%)
K3.	Do you know color coding?	
	Yes	72(72%)
	No	28(28%)
K4.	Can any plastic bag be used for disposal?	
	Yes	33(33%)
	No	67(67%)
K5.	Waste should not be stored beyond	
	12 hrs	88(88%)
	48hrs	4(4%)
	72 hrs	6(6%)
	96 hrs	0
	Don't know	2(2%)
K6.	Proportion of infectious waste generated in hospital	
	10-20%	23(23%)
	20-40%	19(19%)
	40-60%	12(12%)
	60-80%	43(43%)
	Don't Know	02(2%)
K7.	Have you any training in BMW mgt?	
	Yes	14(14%)
	No	86(86%)
K8.	Symbol of biomedical hazard	
	Biomedical hazard sign	30(30%)
	Cytotoxic hazard sign	16(16%)
	Don't know	54(54%)

*Multiple answers

Table 2 reveals that around 92 per cent respondents knew that catheter, I/V line and cotton all come under biomedical waste category. 64 per cent told that all health care waste are hazardous while rest (36%) negated the statement. 72 per cent respondents knew about color coding and one third told that any plastic bag can be used for disposal. A large number of respondents (88%) told that biomedical waste should not be stored beyond 12 hours while 4 per cent and 6 per cent told that it should not be beyond 48 hours and 72 hours respectively. 2 per cent of them did not know about it. As far as proportion of infectious waste was concerned, majority (43%) told that it was 60%-80% followed by 10%-20% by 23 per cent, 20%-40% by 19 per cent and 40%-60% by 12 per cent. 2 per cent of them did not know about it. Only 14 per cent of respondents had any training in biomedical waste management. 54 per cent did not know about symbol of biomedical hazard while 30 per cent correctly identified biomedical hazard sign and 16 per cent cytotoxic hazard sign.

Table 3: Attitude of Paramedics regarding BMW Management.

S. No	Characteristics	No. (%) N=100
A1.	Is it important to know about BM hazards?	
a.	Yes	98(98%)
b.	No	02(2%)
A2.	Do you agree BMW should be segregated?	
	Yes	97(97%)
	No	03(3%)
A3.	Do you think that your knowledge is adequate?	
	Yes	34(34%)
	No	66(66%)
A4.	Do you need further training?	
	Yes	91(91%)
	No	09(9%)
A5.	Do you think BMW mgt should be compulsory part of medical curriculum?	
	Yes	93(93%)
	No	07(7%)
A7.	Does BMW mgt is an extra burden on work	
	Yes	17(17%)
	No	83(83%)

Table 3 shows that so far as attitude of respondents' regarding biomedical waste management is concerned, 98 per cent knew that it is important to know about biomedical waste hazards and 97 per cent agreed that it should be segregated. Although about one-third of the respondents thought that their knowledge was adequate yet 91 per cent felt that they needed further training. 93 per cent respondents had opinion that biomedical waste management should be compulsory part of medical curriculum. While 17 per cent respondents felt that biomedical waste management is an extra burden on work, 87 per cent said it is a part of work.

Table 4: Practices of Paramedics regarding BMW Management.

S. No	Characteristics	No. (%) N=100
P1.	Do you segregate the waste as per rule?	
a.	Yes	30(30%)
b.	No	70(70%)
P2.	In which bag you dispose materials contaminated with blood? N=30	
	Red	22(73.3%)
	Yellow	08(26.7%)
	Blue	-
	Black	-
P3.	Where do you dispose off pharmaceutical waste? N=30	
	Red	-
	Yellow	04(13.3%)

	Blue	07(23.3%)
	Black	19(63.4%)
P4.	How do you dispose off hazardous liquid waste? N=30	
	Drain	02 (6.6%)
	Black bag	-
	Drain after chemical treatment	11(36.7%)
	Don't know	17(56.7%)
P5.	Where do you dispose off sharp waste? N=30	
	Red	11(36.7%)
	Yellow	03(10%)
	Blue	09(30%)
	Black	07(23.3%)
P6.	Color code for disposing normal college waste? N=30	
	Red	-
	Yellow	07(23.3%)
	Blue	-
	Black	23(76.7%)
P7.	Do you label it before filling bags? N=100	
	Yes	24(24%)
	No	76(76%)
p8	Does your college has a tie up with waste mgt company? N=100	
	Yes	43(43%)
	No	57(57%)
	Don't know	--

Regarding practices it was found in **Table4** that only 30 per cent of respondents told that they were segregating the waste as per rule. Of these 30 respondents, 73.3 per cent and 26.7 per cent were disposing materials contaminated with blood in red and yellow bags respectively while pharmaceutical waste was being disposed off in yellow, blue and black bags by 13.3 per cent, 23.3 per cent and 63.4 per cent respectively. Around 6.6per cent were disposing off hazardous liquid directly into drain while 36.7 per cent after chemical treatment. More than half (56.7%) did not know how to dispose it off. Only 30 per cent of respondents were disposing sharp waste in blue bags while rest in red (36.7%), yellow (10%) and black (23.3%) bags. More than two-third respondents were disposing normal college waste into black bags while rest (23.3%) in yellow bags. Of all the 100 respondents only 24 (24%) were labelling waste before filling the bags. 43 per cent reported that their college had tie-up with waste management company while rest (57%) had contrary view

Discussion:

Regarding knowledge of biomedical waste handling it was found that 92 per cent knew that all waste generated in health care facility come under biomedical waste category. Around two-third (64%) told that all biomedical waste is hazardous. It is well known fact that only 10%-25% waste is hazardous.² Only around one-fourth knew this fact. Three-fourth knew about color coding. Bio-medical waste should be collected in non-chlorinated plastic bags¹. One-third had opinion that it can be collected in any bags. According to rules infectious waste cannot be stored for more than 48 hours because it starts harbouring micro-organisms⁴. Only 4 per cent had correct knowledge. Only 14 per cent had any training in bio-medical waste management. 54 per cent could not identify any biohazard symbol. So we can see that their knowledge regarding biomedical waste management was inadequate. Some studies reported better knowledge among paramedical workers.^{5,6}

Awareness accredits to thinking towards a proper situation. Regarding awareness it was found that more than 90 per cent felt that it is important to know about biomedical hazards, it should be segregated, should be compulsory part of medical curriculum and they needed further training. 83 per cent felt that biomedical waste management is a part of their work while 17 per cent thought that it is an extra burden. A favourable attitude was reported by other studies also^{5,6}.

When it comes to practices related questions we found that inadequate knowledge has translated into poor practices. Only 30 per cent were segregating and 24 per cent were labelling the waste before filling the bag. Soiled waste should be disposed off in yellow bags. Only one fourth were doing the same. Similarly most pf respondents were disposing pharmaceutical in black (63.4%) and blue (23.3%) instead of yellow bags (13.3%). Similarly other practices were found to be unsatisfactory. A gap in knowledge, attitude and practices was seen in other studies also^{5,6}. Only 43 per cent knew that their college has a tie up with waste management company.

Conclusion and Recommendations:

Knowledge, attitude and practices are three pillars of dynamics of life. Although the knowledge was inadequate, the attitude of respondents was found to be favourable. Poor practices can be improved by imparting knowledge and motivating health care providers. An urgent need of training of all was felt.

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