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Original Research Article

A study on the knowledge, attitude and practice among health care personnel in secondary care hospital of Prayagraj district

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ABSTRACT

Background: The World Health Organization (WHO) defines medical waste as waste generated by health care activities including a broad range of materials, from used needles and syringes to soiled dressings, body part, diagnostic samples, blood, pharmaceuticals, medical devices and radioactive material. Bio medical waste creates great risk of being injured or infected to medical professionals, if not handled properly. Objective of the study was to assess knowledge, attitude and practice regarding bio-medical management among health-care personnel in secondary care hospitals in Prayagraj district.
Methods: A total 615 personnel were listed in urban and 363 in rural secondary care hospitals. Sample size was calculated to be 470. The study subjects were selected from each stratum randomly in proportion to the size of strata in order to complete the sample size from both urban and rural. This was a questionnaire based cross-sectional study.
Results: Doctors, nurses and lab technician had satisfactory knowledge, practice and good attitude regarding biomedical waste management. It was observed that in urban hospitals 68.96% doctor, 66.01% nurses, 59.25% lab technicians and 55.12% sanitary staff had complete knowledge while in rural 62.85% doctors, 64.28% nurses, 46.4% lab technician and 42.85% sanitary staff had complete knowledge. Majority of healthcare personnel had positive attitude in both urban and rural hospitals. Regarding practice urban hospitals were doing satisfactory practice as compared to rural hospital.
Conclusions: The study revealed that the attitude among health-care personnel was good while knowledge and practice were to the tune of satisfactory.

Keywords: Biomedical waste management, Knowledge, attitude and practice, Health-care personnel

INTRODUCTION

Biomedical waste (BMW) is waste generated during diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining thereto, or in the production and testing of biologicals, and is contaminated with human fluids.[1]

In developing countries like India the waste is carried to the outskirts of the city and dumped indiscriminately in a most insanitary way. 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 healthcare waste. Indiscriminate disposal of these wastes and exposure to such waste poses a serious threat to the environment and to

human health may cause the transmission of diseases like typhoid, cholera, etc. Bio-medical waste requires specific treatment and management prior to its final disposal.

The severity of the threat is further compounded by the high prevalence of diseases such as human immunosuppressive virus (HIV) and hepatitis B and C.[2] BMW creates great risk of being injured or infected to medical professionals like doctors, nurses, technicians, visitors, sanitary staff or general public, if biomedical waste management not handled properly.[3]

In 1998, the Government of India framed the 'biomedical wastes (management and handling) rule amended in June 2000, based on sections 6, 8 and 25 of the 'environment (protection) act 1986' were prescribed by the ministry of environment and forest to ensure that every hospital generating bio-medical waste need to set up requisite bio medical waste treatment facilities to ensure requisite treatment of waste.

During 1994-95, the government of India, under the directions of the Supreme Court, ordered medical establishments not to discard medical waste in municipal bins but to burn it in incinerators installed in their premises.[4] It is estimated that annually about 0.33 million tons of hospital waste is generated in India and, the waste generation rate ranges from 0.5 to 2.0 kg per bed per day.[5]

A study in Shiraz, Iran city in 2013 among 261 health personnel from 9 hospitals showed that majority of the health personnel have appreciable knowledge of the collection and minimization of personal risk associated with hospital waste. Sixty one (41.8%) workers from government hospitals and 67 (58.3%) from private hospitals showed interest in education and training programs.[6]

Knowledge, attitude and practice (KAP) study tells us about knowledge possessed by a community and the ways in which they demonstrate their knowledge and attitude through their actions. There are few studies regarding knowledge and practice among health care personnel of secondary care hospitals. Hence the present study will be undertaken in Prayagraj district to assess the knowledge, attitude and practices in bio-medical waste management and to impart awareness of roles and responsibilities of health care personnel regarding handling of bio-medical waste management.

METHODS

A community based cross-sectional study was carried out in Prayagraj district from May 2019 to May 2020. Firstly, listing of all the personnel involved in biomedical waste management (doctor, nurses, lab technician, sanitary staff) was done both for rural and urban secondary care government hospitals. A total 615 personnel were listed in urban and 363 in rural secondary care hospitals. Then separately for both urban and rural personnel in secondary care hospitals, four strata were created namely (doctor, nurses, lab technician, and sanitary staff).

In urban hospitals, 181 doctors, 214 nurses, 58 lab technicians and 162 sanitary staff were there. In rural hospitals, 146 doctors, 88 nurses, 56 lab technicians and 73 sanitary staff were there. Total number of personnel were 978. Since sample size was calculated to be 470 (that amounts to 48% of total personnel), it was decided to select 295 personnel from urban and 175 from rural secondary care government hospitals which is in proportion (i.e. 48%) to their respective numbers in urban (615) and rural hospitals (363).

Then, the personnel were selected from each stratum randomly in proportion (48%) to the size of stratum in order to complete the sample size from urban and rural each. So, in urban hospital, 87 doctors, 103 nurses, 27 lab technicians and 78 sanitary staff were decided to be selected while in rural 70 doctors, 42 nurses, 28 lab technician, 35 sanitary staff were decided to be selected for the study. The data was analyzed using statistical software, SPSS version 23. Chi-square test is used to test the associations. P value less than 0.005 were considered as significant. This study has been approved by the institutional ethics committee, M.L.N Medical College, Prayagraj.

Inclusion criteria

Subjects willing to participate in the present study were included in the study.

Exclusion criteria

Subjects who were not willing to participate in the present study and subjects who were working in medical fields for less than 6 months were excluded from the study.

RESULTS

A total of 470 participants (87 doctors, 103 nurses, 27 lab technicians and 78 sanitary staff from urban and 70 doctors, 42 nurses, 28 lab technicians, 35 sanitary staff from rural) took part in the study. Table 1 shows knowledge of various health personnel regarding BMW management. In both urban and rural hospitals complete knowledge regarding BMW was fairly good among doctors i.e. 68.96%, and least among sanitary staff i.e. 55.12% in urban hospital and 64.28% doctors and 40% sanitary staff in rural. Majority of doctors in both urban and rural hospital i.e. 56.32% in urban and 51.42% in rural and only 37.34% sanitary staff in urban, 25.71% in rural were aware about the percentage of infectious and non-infectious waste. About 66.67% doctors, 70.87% nurses, 55.56% L.T. and 50% sanitary staff were cognizant about the total waste generated per bed per day while in rural hospitals 62.85% doctors, 64.28% nurses, 46.4% L.T. staff and 42.85% sanitary staff were aware. In urban 62.06% doctors, 65.04% nurses, 48.14 lab technician, 35.89%

sanitary staff while in rural 62.85% doctor, 64.28% nurses, 46.4% lab technician, and 42.85% sanitary staff having knowledge about BMW rules and regulations. In urban hospital 78.16% doctors, 74.75% nurses, 70.37% L.T. staff and 65.38% sanitary staff knew about bio hazard symbols while in rural hospital, majority of 75.71% doctors, 71.42% nurses, 64.28% L.T. and 57.14% sanitary staff aware about bio hazard symbols. More than 90% of doctors, nurses, L.T. in both urban and rural knew about disease transmission by biomedical waste. In urban hospitals, knowledge about storage of waste among doctors was 59.77% while 63.10% nurses, 44.45% L.T. and 44.87% sanitary staff knew about that the waste can be stored for a maximum period of 48hours. Similarly in rural hospitals more than 58.57% of doctors and 61.90% nurses had knowledge, whereas sanitary staff was least aware about the same.

The attitude of health personnel show regarding BMW management has been showed in Table 2. Majority (>90%) of health care personnel shows positive attitude and considers biomedical waste management a team work. In the present study all the health workers in both rural and urban were in favor of strict implementation. Regarding color coding for waste disposal majority of nurses shows positive attitude 90.29% and encourage advice to subordinates whereas 87.17% of sanitary staff, 81.48% of L.T. and 78.16% of doctors' advice to their subordinates regarding color coding for waste management. In urban hospital 87.37% nurses, 81.48% lab technician, 77.01% doctor and 79.85% sanitary staff showed positive attitude for waste segregation of waste. In rural hospitals 90.47% nurses followed by 79.71% doctor, 75% L.T. 74.28% advice for the need of segregation of waste.

Table 3 shows health personnel regarding correct soiled waste in specific container was performed by 65.51% doctors, 69.90% nurses, 59.25% L.T. and 55.12% sanitary staff, while in rural hospitals 67.14% doctors, 66.67% nurses, 53.57% L.T. and 55.12% sanitary staff did the same. In urban hospital 89.32% nurses, 83.90% doctors, 81.48% L.T. and 78.20% sanitary staffs were found to be practicing cutting the hub of syringe before disposing it while in rural hospitals 76.19% nurses, 71.42% doctor, 67.85% lab technician and only 51.42% sanitary staff were found to be practicing the same. In urban hospitals correct practice of disposal of urine bags and catheters in specific containers was observed in 62.06% doctors, 66.01% nurses, 55.56% L.T., 51.28% sanitary staff while in rural hospitals, 60% doctors, 64.28% nurses and 46.42% L.T. and 42.85% sanitary staff follow this. Disposal of general waste was not practiced properly especially by sanitary staff in both rural and urban hospital.

Table 1: Knowledge of healthcare personnel regarding BMW management.

S. no.	Knowledge regarding	Urban				Rural			
		Doctor (n=87) (%)	Nurses (n=103 (%)	L.T. (n=27) (%)	Sanitary staff (n=78) (%)	Doctor (n=70) (%)	Nurses (n=42) (%)	L.T. (n=28) (%)	Sanitary staff (n=35) (%)
1	Complete knowledge about BMW	60 (68.96)	68 (66.01)	16 (59.25)	43 (55.12)	45 (64.28)	26 (61.90)	15 (53.57)	14 (40)
2	Percentage of infectious and non-infectious	49 (56.32)	52 (53.39)	10 (37.34)	20 (25.64)	36 (51.42)	20 (47.61)	11 (39.28)	9 (25.71)
3	Total waste generated	58 (66.67)	(70.87)	(55.56)	(50)	(62.85)	(64.28)	(46.4)	(42.85)
4	BMW management rules	54 (62.06)	(65.04)	(48.14)	(35.89)	(64.28)	(61.20)	(57.14)	(42.85)
5	Know about biohazard symbol	68 (78.16)	(74.75)	(70.37)	(65.38)	(75.71)	(71.42)	(64.28)	(57.14)
6	Disease transmitted	81 (93.10)	94 (91.26)	25 (92.59)	60 (76.9)	66 (94.28)	38 (90.47)	26 (92.85)	29 (82.85)
7	Filling of waste bin upto 3/4th mark	59 (67.81)	66 (64.07)	15 (55.56)	42 (53.84)	42 (60)	27 (64.28)	15 (53.57)	17 (48.57)
8	Color coding containers	60 (68.96)	74 (71.84)	17 (62.96)	39 (50)	46 (65.71)	29 (69.04)	17 (60.71)	18 (51.42)
9	BMW storage	52 (59.77)	65 (63.10)	12 (44.45)	35 (44.87)	41 (58.57)	26 (61.90)	12 (46.42)	14 (40)
10.	Blood spills disinfected by	66 (75.86)	76 (73.78)	16 (59.25)	48 (61.53)	50 (71.42)	29 (69.04)	18 (64.28)	23 (65.71)
11	Sharps, syringes disposal	84 (96.55)	95 (92.23)	22 (81.48)	65 (83.34)	65 (94.20)	38 (90.47)	24 (88.89)	28 (80)

Table 2: Attitude of healthcare personnel regarding BMW management.

Sl no.	Attitude regarding	Urban				Rural			
		Doctor	Nurses	L.T.	Sanitary staff	Doctor	Nurses	L.T.	Sanitary staff
		N=87 (%)	N=103 (%)	N=27 (%)	N=78 (%)	N=70 (%)	N=42 (%)	N=28 (%)	N=35 (%)
1	No. of persons considered it is a team work	85 (97.70)	100 (97.08)	25 (92.59)	76 (97.43)	66 (95.65)	41 (97.61)	26 (92.85)	27 (96.42)
2	In favor of strict implementation	83 (95.40)	103 (100)	27 (100)	74 (94.87)	68 (98.55)	38 (97.61)	27 (96.42)	32 (91.42)
3	Considered it is a financial burden	87 (100)	98 (95.14)	25 (92.59)	67 (85.89)	63 (91.30)	38 (90.47)	25 (89.29)	29 (82.85)
4	Willingness to attend programme for up gradation of knowledge	73 (83.90)	95 (92.33)	21 (77.78)	58 (74.35)	60 (86.95)	37 (88.09)	23 (82.14)	26 (74.28)
5	Advice to subordinates regarding color coding for waste disposal	68 (78.16)	93 (90.29)	22 (81.48)	68 (87.17)	57 (82.60)	36 (85.71)	22 (78.57)	28 (80)
6	Advice segregation of waste	67 (77.01)	90 (87.37)	22 (81.48)	62 (79.48)	55 (79.71)	38 (90.47)	21 (75)	25 (71.42)
7	Takes responsibility to inform once bag is full	64 (73.56)	87 (84.46)	20 (74.07)	64 (82.05)	56 (80)	38 (90.47)	22 (78.57)	29 (82.85)

Table 3: Practice of healthcare personnel regarding BMW management.

Sl no.	Practice regarding	Urban				Rural			
		Doctor	Nurses	L.T.	Sanitary staff	Doctor	Nurses	L.T.	Sanitary staff
		N=87 (%)	N=103 (%)	N=27 (%)	N=78 (%)	N=70 (%)	N=42 (%)	N=28 (%)	N=35 (%)
1	Disposal of soiled dressing in appropriate container	57 (65.51)	72 (69.9)	16 (59.25)	43 (55.12)	47 (67.14)	28 (66.67)	15 (53.57)	16 (45.71)
2	Cut the needle before disposal	73 (83.9)	92 (89.32)	22 (81.48)	54 (69.23)	50 (71.42)	32 (76.19)	19 (67.85)	18 (51.42)
3	Disposal of sharps in puncture proof container	75 (86.2)	93 (90.29)	23 (85.18)	58 (74.35)	52 (74.28)	34 (80.95)	21 (75)	20 (57.14)
4	Disposal of urine bags and catheters in appropriate container	54 (62.06)	68 (66.01)	15 (55.56)	40 (51.28)	42 (60)	29 (64.28)	13 (46.42)	15 (42.85)
5	Disposal of plastic cover syringes in appropriate container	52 (59.77)	67 (65.04)	16 (59.25)	39 (50)	43 (61.42)	25 (59.52)	12 (42.85)	13 (37.14)
6	Disposal of blood bags in appropriate container	56 (64.36)	70 (67.96)	17 (62.96)	43 (55.28)	44 (62.87)	28 (66.67)	14 (50)	16 (45.71)
7	Filling of waste bin upto 3/4th mark	56 (64.36)	65 (63.1)	13 (48.14)	35 (44.87)	40 (57.14)	26 (61.9)	13 (46.42)	14 (40)
8	Collection of waste using trolleys	NA	NA	NA	60 (76.92)	NA	NA	NA	25 (71.42)
9	Storage of waste at appropriate place	NA	NA	NA	62 (79.48)	NA	NA	NA	26 (74.28)

DISCUSSION

In urban 61.53% of sanitary staff knew that waste comprised of both infectious and non-infectious, whereas in rural majority of doctors and 57.14% sanitary staff knew that waste comprised of both infectious and non- infectious waste as compared to other study Mathur found that 94.12% doctors knew that waste comprised of both infectious and non-infectious this was followed by 80% nurses, 77.27% lab technician. Only 37.5% of sanitary staff knew about composition of biomedical waste.[7]

More than 60% of doctors and nurses in both urban and rural were aware about BMW rules and regulations which is similar to found to be Saini et al 80% doctors, 60% nurses were aware about them.

In the present study 48.14% lab technician, 35.89% sanitary staff in urban and 57.14% lab technician 42.85% sanitary staff in rural were aware BMW rules and regulations which is higher as compared to results found by Anand et al in their study i.e. 40% lab technicians and only 16% of class IV employees knew about BMW rules and regulations and Saini et al results showed 14% lab technicians and 12% class IV employees knew about the same.[8,9]

68.96% of doctor, 71.84% nurses, 62.96% lab technicians and 50% sanitary staff in urban hospital and 65.71% doctors, 69.04% nurses, 60.71% lab technicians, 51.42% sanitary staff in rural hospitals knew about colour coding of containers. The results show better knowledge as compared to other study like Anand et al who found only 33% of class IV employees knew about color coding of containers as compared to 93% doctors, 86% nurses and 80% lab technicians. Deo et al found that only 20% of health staff knew about color coding. [8.10]

In both urban and rural hospitals more than 90% of health care personnel showed positive attitude and considers biomedical waste management a team work. This result is similar to other studies like in study by Malini et al found that majority of nursing staff realised that biomedical waste management is a team work and it did not create extra burden on their work.[11] This positive attitude of nurses was also seen in study by Madhukumar et al.[12]

In the present study all the health workers in both rural and urban were in favor of strict implementation. Similarily in other study like Gupta and Madhukumar majority (82%) were in favour of implementation.[12,13] Regarding color coding for waste disposal majority of nurses shows positive attitude 90.29% and encourage advice to subordinates whereas 87.17% of sanitary staff, 81.48% of lab technician and 78.16% of doctors' advice to their subordinates regarding color coding for waste management.

In the present study correct practice of discarding sharp waste in puncture proof containers was observed maximum amongst nurses 90.29% in urban hospitals while in rural hospital this figure was lower 80.95% followed by doctors in urban hospital 86.20% which was higher than in rural hospital 74.28%, least in sanitary staff in rural hospital 57.14%. This result was comparable to other studies like Bhattar et al found that the overall practice of discarding sharp waste in puncture proof containers was 83%; maximum amongst nurses 96%, followed by doctors 80% and then technicians 73%.[14] This figure is similar to study Bhagwati et al where they found overall sharp disposal accurately amongst 86% of health care workers.[15]

In urban hospital 80% of doctors and 69.23% sanitary staff have the habit of shredding the syringe and cutting the hub of the syringe. This figure was higher as compared to rural hospitals 71.42% of doctors, 76.19% nurses and 67.85% lab technician cut the hub of the syringe before dispose it, almost half no (51.42%) of sanitary staff practiced. This result was comparable to other study like Anand who found that more than 80% of doctors and nurses were discarding used needles in needle destroyer in contrast to 50% of class IV employees practicing it.[8] Bhattar et al found that practices of the nurses were better than the doctors.[14] Malini et al reported that majority of the doctors followed correct practices followed by nursing staff and lab technicians.[11]

In both urban hospitals& rural hospital more than 60% doctor, nurses, 59.25% lab technician in urban and 46.42% in rural hospital, 52.18% sanitary staff in urban and only 41.9% in rural hospital practiced proper disposal of biomedical waste in specific container. Anand reported that 83.3% doctors, 77.2% nurses, 80% lab technicians and 41.6% sanitary staff followed proper disposal of biomedical waste in specific container.[8]

CONCLUSION

The study revealed that attitude towards BMW management was good among healthcare personnel. Overall the knowledge and practice of BMW management among healthcare personnel was satisfactory. Knowledge and attitude towards bio-medical was better among doctors and nurses than the other cadre of staff. There is a need for holding seminars, trainings to increase awareness about need for proper segregation and disposal of hospital waste.

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