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Original Research Article

An Assessment of Knowledge, Attitude and Practices about Biomedical Waste Management among Owners of Nursing Homes/Private Hospitals in the Central Area of Uttar Pradesh, India

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ABSTRACT

Objective: The aim of the study was to assess the knowledge, attitude and practices regarding biomedical waste management among owners of nursing homes/ private hospitals.
Methods: This was a descriptive cross-sectional study design conducted in the city of Lucknow for a period of 4 months between May-August, 2013. The owners of the private nursing homes/ private hospitals (having bed>50) of Lucknow city were interviewed. A total of 40 subjects were included in the study.
Results: Majority (80%) of the subjects were MD/MS in different disciplines of medicine and surgery. The duration of running of hospital was ≥10 among 57.5% of the subjects. About half (55%) of the subjects received any training BMW management. There was a significant difference in the BMW knowledge and attitude scores for age greater than 40 years and less than 40 years of age ($p<0.001$). The knowledge and attitude score was higher who had any training on BMW management compared with those who did not had any training. Higher percentages of subjects (77.5%) were aware about HIV might transmit through BMW. Majority (90%) felt that safe management of health care waste was an extra burden on work.
Conclusion: The importance of training regarding biomedical waste management cannot be overemphasized; lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal among medicos as well as paramedical staff.
Key words: Biomedical waste, knowledge, attitude

INTRODUCTION

The Biomedical Waste (management and handling) Rule, 1998, drafted by the Ministry of Environment and Forest, Government of India and came into enforcement in July 28, 1998. This rule encompasses all who involve in any step of biomedical waste generation and handling.[1] The proper health care waste management include five steps namely segregation of bio-medical waste at the point of generation, treatment, storage, transportation and final disposals. The segregation of biomedical waste at the source of generation is the first step, but crucial step in health care waste management because of specific methods needed for the treatment and disposal of different categories of wastes. The health

personnel who involved in handling the biomedical waste at different point of generation in hospital include doctors, nurses, lab technicians, ward boy etc. Thus the knowledge regarding biomedical waste management among health care personnel have greater impact on health and environment.

The infrastructure requirement for biomedical waste (BMW) management as per BMW rules is very expensive. Ramky a private firm in southern part of India offers services of handling hospital waste on pay and use basis.[2] They charge Rs.500/- per month from clinics for collecting waste and serve thrice per week. In India, hospital waste generated is about 1.59 to 2.2 kg/bed/day.[3]

The waste generated during entire course of healthcare activities is special in terms of its composition, quantity and their potential hazardous effect as compared to waste of other places, which require special attentiveness for its management.[4] The improper management of biomedical waste poses significant hazardous risk to the patients, healthcare workers, the community and environments.[5] The inappropriate healthcare waste management caused 21 million hepatitis B virus (HBV) infections (32% of all new infections); 2 million hepatitis C virus (HCV) infections (40% of all new cases); 260,000 HIV infections (5% of all new cases) in 2000. Epidemiological studies indicate that a person who experiences one needle stick injury from a needle used on an infected source patient has risks of 30%, 1.8%, and 0.3% respectively of becoming infected with HBV, HCV and HIV.[6]

Adequate knowledge about the health hazard of hospital waste, proper technique and methods of handling the waste, and practice of safety measures can go a long way toward the safe disposal of hazardous hospital waste and protect the community from various adverse effects of the hazardous waste. With this background, the present study aimed to assess the knowledge, attitude and practices regarding biomedical waste management among owners of nursing homes/ private hospitals in Lucknow City, UP, India.

MATERIAL AND METHODS

Study design: A descriptive cross-sectional study design was used and ethical approval was taken from the Ethical committee of the Institute.

Study area: The study was conducted in the city of Lucknow for a period of 4 months between May-August, 2013.

Study subjects: The owners of the private nursing homes/ private hospitals (having bed>50) of Lucknow city were interviewed.

Sampling technique: The two stage cluster sampling technique was used in the study. At stage I, the whole city was divided in 4 areas - east, west, north and south and list of hospitals were made. In the second stage, from each area, 10 nursing homes/private hospitals were randomly selected and the owners of the selected hospitals were interviewed. Thus, a total of 40 subjects were included in the study. Oral consent was taken from each selected subjects.

Data collection: The self administered questionnaire was used to gather information on socio-demographic characteristics, knowledge regarding color coding for segregation of BMW, diseases transmission through BMW, attitude towards BMW, practices like hand wash, protective measures, practice just after needle prick injury etc. The knowledge was assessed by 5 point Likert scale maximum score being 5 and minimum being 0. The higher score reflect greater knowledge regarding BMW. The subjects who were not present at the day of administration of questionnaire and not willing to participate were under exclusion criteria of the study.

Analysis: The collected data was entered and analyzed by using SPSS 16.0. Frequency, proportions were calculated and reported. The association between different socio-demographic factors and the knowledge score regarding BMW were analyzed by independent t-test. The p-value<0.05 was considered as significant.

RESULTS

The study was conducted among 40 subjects who were the owners of nursing home/private hospitals in the city of Lucknow, Uttar Pradesh, India over a period of 4 months. More than half (65%) of the subjects were males and below 40 years (70%) of age. Majority (80%) of the subjects were MD/MS in different disciplines of medicine and surgery. The duration of running of hospital was ≥10 among 57.5% of the subjects. About half (55%) of the subjects received any training BMW management (Table-1).

Table-1: Socio-demographic profile of the subjects.

Socio-demographic profile		No. of subjects (n=40)	Percentage (%)
Gender	Male	26	65.0
	Female	14	35.0
Age in years	<40	28	70.0
	≥40	12	30.0
Education	MD/MS	32	80.0
	Non-MD/MS	8	20.0
Duration of hospital since opening	<10	17	42.5
	≥10	23	57.5
Any training on BMW	Yes	22	55.0
	No	18	45.0

Table-2 depicts the mean scores about knowledge and attitude towards BMW management according to socio-demographic profile of the subjects. There was a significant difference in the BMW knowledge and attitude scores for age greater than 40 years (M=4.65, SD= 0.15) and less than 40 years (M=2.13, SD=0.23) of age; p<0.001; for males (M=3.24, SD=0.13) than females (M=2.89, SD=0.11); p<0.001; for duration of hospital running >10 years (M=4.01, SD=0.25) and <10 years (M=2.99, SD=0.33); p<0.001. The knowledge and attitude score was also significantly (p<0.001) higher among those who were educated MD/MS (M=4.12, SD=0.16) than Non-MD/MS (M=2.24, SD=0.17) subjects. Similarly, the knowledge and attitude score was higher who had any training on BMW management compared with those who did not had any training.

Table-2: Mean (±SD) scores about knowledge and attitude towards BMW management.

Socio-demographic profile		Mean (±SD)	p-value[1]
Gender	Male	3.24±0.13	0.07
	Female	2.89±0.11	
Age in years	<40	2.13±0.23	0.0001*
	≥40	4.65±0.15	
Education	MD/MS	4.12±0.16	0.0001*
	Non-MD/MS	2.24±0.17	
Duration of hospital since opening	<10	2.99±0.33	0.0001*
	≥10	4.01±0.25	
Any training on BMW	Yes	4.56±0.14	0.0001*
	No	2.16±0.18	

[1]Unpaired t-test, *Significant

The knowledge regarding infectious disease transmission due to improper BMW management among the subjects was also assessed in the study. Higher percentage of subjects (77.5%) were aware about HIV might transmit through BMW and this was slightly lower about hepatitis-B might transmit through BMW (55%). However, 67.5% of the subjects viewed that Hepatitis-C might transmit through BMW and 70% of the subjects opined that BMW had hazardous effect on environmental (Table-3).

Table-3: Knowledge about health hazards of BMW.

Health hazards	Yes		No		Score Mean±SD
	No.	%	No.	%	
HIV may transmit through BMW	31	77.5	9	23.5	4.23±0.14
Hepatitis-B may transmit through BMW	22	55.0	18	45.0	3.99±0.17
Hepatitis -C may transmit through BMW	27	67.5	13	32.5	4.12±0.12
Can't touch mercury by bare hand	34	85.0	6	15.0	4.02±0.16
BMW has hazardous effect on Environmental	28	70.00	12	30.0	4.17±0.14

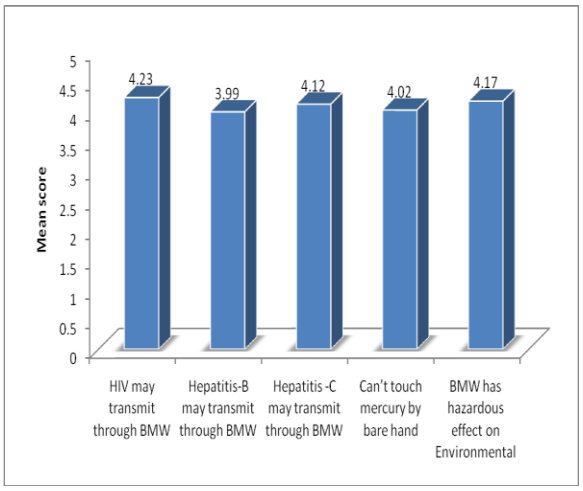

Fig.1: Knowledge scores about health hazards of BMW.

The scores about knowledge regarding health hazards of BMW was higher for 'HIV may transmit through BMW-M=4.23, SD=0.14) than other health hazards (Fig.1).

Table 4 and 5 presents attitude and practices towards BMW management. Majority (90%) felt that safe management of health care waste was an extra burden on work. However, 85% felt that safe management of BMW was not a issue at all and 82.5% felt that safe management of health care waste was the responsibility of the institution and not the individual. Majority (77.5%) made arrangement in their hospital for disposal in specified color coded containers.

Table-4: Attitudes towards BMW management.

Attitudes	Yes		No		Score Mean±SD
	No.	%	No.	%	
Feels that safe management of BMW is not a issue at all	34	85.0	6	15.0	4.13±0.13
Feels that Safe management of health care waste is the responsibility of the institution and not the individual	33	82.5	7	17.5	4.19±0.14
Feels that Safe management of Health Care waste is an extra burden on work	36	90.0	4	10.0	3.82±0.19
Likes to undergo a training programme on management of BMW	32	80.0	8	20.0	4.23±0.18

Table-5: Practices towards BMW management.

Practices	Yes		No		Score Mean±SD
	No.	%	No.	%	
Disposal in specified color coded containers	31	77.5	9	22.5	3.23±0.09
Disposal of sharps in puncture proof containers	28	70.0	12	30.0	3.99±0.11
Reporting of injuries due to improperly disposed sharps	29	72.5	11	27.5	3.88±0.13

DISCUSSION

This cross-sectional study was designed to capture the knowledge, attitude and practices about BMW management among the owners of the nursing homes/private hospitals in a northern part of India and in best of my knowledge; this was the first study assessing the knowledge among the owners. It is not necessary, all the owners are medicos. There are some of the owners who are not medicos and are running and managing the private hospitals. Most of the studies are conducted among doctors, nursing staff and other paramedical staff.[7-11] In the present study, the knowledge of subjects with MD/MS qualification was better compared to non-MD/MS qualified subjects. This was similar to the findings from other studies.[8,13] The attitude of the subjects towards BMW management was a matter of concern. It has been reported that the training of both the technical staff and the nontechnical staff is critical for the proper and appropriate management of biomedical waste.[8,10]

In the present study, the knowledge regarding infectious disease transmission due to improper BMW management among the subjects was also assessed in the study. Higher percentage of subjects (77.5%) were aware about HIV might transmit through BMW and this was slightly lower about hepatitis-B might transmit through BMW (55%). However, 67.5% of the subjects viewed that Hepatitis-C might transmit through BMW and 70% of the subjects opined that BMW had hazardous effect on environmental. Stein et al[14] in their study reported that among doctors and nurses, only 37% reported that they ever suffered needle stick injury. Low reporting of injuries may be attributed to the fact that most of the doctors and other technical and nontechnical staff are unaware about a formal system of injury reporting which should be established within all the health facilities.

In this study, majority (90%) felt that safe management of health care waste was an extra burden on work. However, 85% felt that safe management of BMW was not a issue at all and 82.5% felt that safe management of health care waste was the responsibility of the institution and not the individual. Majority (77.5%) made arrangement in their hospital for disposal in specified color coded containers. The findings of the present study is consistent with the findings of a study done among doctors on knowledge and practices regarding biomedical waste management at Johannesburg which showed that 90% of respondents treated biomedical wastes differently than general wastes.[15] The finding of this study is also supported by the observation made in the study done at Bangalore which stated that 87.5% of study subjects were in the favor of segregation of BMW at source of generation.[16] The results of this study is slightly higher from the result reported in the study conducted in Bhopal which showed that 54.5% of nurses were aware about the existence of BMW management and handling rules 1998.[17] In a study done at Bangalore stated that 9.9% of study subjects felt biomedical waste management as unnecessary extra burden on healthcare staff.[16] Regarding training on BMW management, a study observed on assessment of existing knowledge, attitude, and practices regarding biomedical waste management among the health care workers in a tertiary care rural hospital of B. G. Nagara which stated that 60% of nurses felt to go for training program on management of BMW.[1]

CONCLUSION

The importance of training regarding biomedical waste management cannot be overemphasized; lack of proper and complete knowledge about biomedical waste management impacts practices of

appropriate waste disposal among medicos as well as paramedical staff.

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