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Original Research Article

Assessment of the knowledge, attitude and practice regarding management of biomedical waste among medical personnel working at SMS Hospital, Jaipur, Rajasthan

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ABSTRACT

Background: Bio-medical waste is defined as any waste that is generated during the diagnosis, intervention, treatment, immunisation and research activities. Hospital waste refers to all waste generated in hospitals whether biological or non-biological. As per World Health Organization (WHO) fact sheet, total of waste generated by health care activities 20% are hazardous among them 18%–64% of waste from health care facilities have unsatisfactory management as per protocol because of improper segregation and gaps in knowledge and practice. To assess the level of knowledge, attitude and practices regarding management of bio-medical waste among medical personnel.
Methods: A hospital based descriptive study was done over the period of one year (April 2019 to March 2020). On the basis of the eligibility criteria total 500 medical and paramedical personal were finally got enrolled. Pre-designed, pre-tested, structured questionnaires were used.
Results: The majorities of participants were male (68%) and the distribution of participants was as followed; doctors (36.6%), nursing staff (37%), lab technicians (4%), 4th class workers (7.6%), and sweeper (15.80%). 63.40% participants score >36 (good score) and only 20.80% score <18 (poor score) on knowledge of BMW management. 45% of participants were known about the risk factors of waste handling. In respect to attitude towards BMW Management, 78% of participants score >36 (good score) and in respect to practice behaviour regarding BMW Management, 79% score >22 (good score).
Conclusions: Our study revealed gaps in certain components of knowledge awareness and practice in between various cadre, so we need to reinforce the reorientation training programs at regular intervals to keep them up-to-date and motivated for BMW management.

Keywords: BMW, Florida coast MoEFCC, Environmental health

INTRODUCTION

Bio-Medical Waste is defined as any waste that is generated during the diagnosis, intervention treatment, immunisation, research activities pertaining thereto and categories mentioned in schedule I of Bio-Medical Waste management and Handling Rules 1998.[1,2] In 1983 WHO convened a working group at Bergen concluded requirement of a system approach for Awareness, Segregation and Source reduction of radio-active waste.[3] The Government of India had launched specific guidelines for the management of bio medical waste in 1998.

The Ministry of Environment Forests and Climate Change, India, notified the Bio-Medical Waste

Management Rules, 2016 under the provisions of the Environment Protection Act, 1986.

In this emission standards and other standards of equipment, effluent, pits are delineated furthermore for traceability of the biomedical waste, bar coding and GPS system are introduced. Latest disposal technique, sustainable, eco-friendly (plasma pyrolysis), green technologies, waste to energy options and recycling (authorised recyclers) are also mentioned.[4]

In India, approximately 619 tonnes of biomedical waste per day were generated by about 3, 22,425 healthcare facilities during the fiscal year 2018–2019.[5] The management of these huge quantities of waste is also challenging if proper segregation is not performed.

Therefore, this study has been planned to assess the knowledge, attitude and practices regarding management of bio-medical waste among medical personnel working at tertiary care hospital Jaipur to find out the gaps and possible measures to improve biomedical waste management at the hospital.

METHODS

After obtaining the institutional ethics committee approval, this hospital based descriptive study done over the period of one year (April 2019 to March 2020) under department of community medicine, SMS medical college, Jaipur Rajasthan.

On the basis of the inclusion and exclusion criteria (those who give written informed consent), a total of 500 medical and paramedical personal were finally got enrolled in this study.

Study type

Descriptive type of observational study.

Inclusion criteria

Medical personnel working at SMS Hospital, Jaipur. Those who give written informed consent for this study.

Exclusion criteria

Non-cooperative medical personnel. Medical personnel with psychiatric disorder. Those were absent at least twice during the interview.

Sampling technique

A complete list of study universe of SMS hospital procured from the academic section of medical college. The total number of medical personnel in SMS. Hospital was 3791, and the sample size for this study was 500.

We selected participants from each cadre according to the proportion of the participants in study population. Following number of participants among different cadre of medical personnel was taken by systematic random sampling method to complete the sample size of 500.

All randomly selected eligible participants were asked to fill the pre-designed, pre-tested, structured questionnaire of knowledge, attitude and practices after explaining them the purpose of study and promise anonymity.

Observed values were recorded and analysed in respect to knowledge attitude and practice of BMW management.

Statistical analysis

All collected data were entered in an excel sheet. Quantitative data were expressed as mean±standard deviation. Qualitative data were expressed as frequency and percentage. Independent sample t test of significance was used to compare two quantitative data. Chi-square (χ^2) test of significance was used to compare proportions between qualitative parameters.

The confidence interval was set to 95%, and the margin of error was accepted at 5%. The $p \leq 0.05$ is considered as a significant.

RESULTS

In present study majority (56%) of participants were between the age group of 18 and 37 followed by 38-57 (43%) age group. 68% of respondents. Cadre wise distribution is as follows i.e.; doctors (36.6%), nursing staff (37%), lab technician (4%), 4th class worker (7.6%), and sweeper (14.80%) (Figure 1).

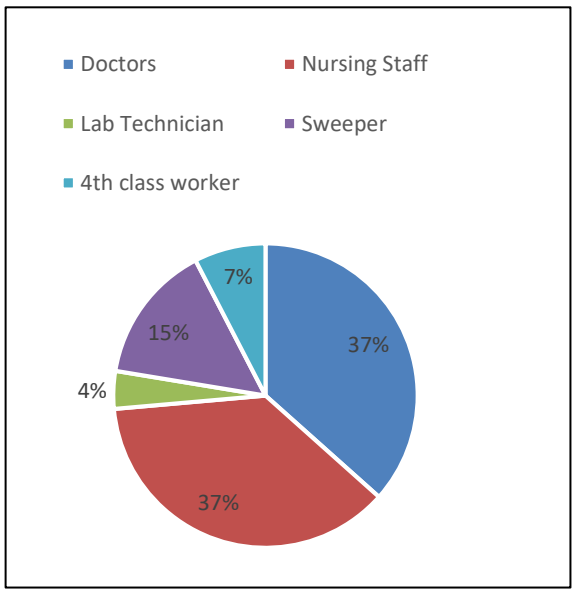

Figure 1: Distribution of participants.

As per socio-economic class 74.2% participants belongs from upper class, 16.40% from upper middle, 7% middle class and 2.4% belongs from lower middle class. In respect to knowledge about BMW management no significant (p>0.05) association was found with age, sex, service duration, branch of participants while significant association (p<0.05) was found with education level and socio-economic class of participants.

45% of participants were know the risk related to waste handling. 35% of participants were knowing the use of PPE kit during waste handling. In respect to knowledge for BMW management, 63.40% participants score >36 (good score) and 15.80% score between 18-36 (fair score) while only 20.80% score <18 (poor score). No significant difference was found between cadre and knowledge related to management of BMW of participants (>0.05) (Table 1). In respect to attitude about BMW management, no significant (p>0.05) association was found with age, gender, service duration, branch while significant association (p<0.05) was found with education level, cadre and socio-economic class of participants.

In respect to attitude of participants, 78% participants score >34 (good score) and 12.40% score between14-34 (fair score), while only 9.80% score <14 (poor score). Cadre wise attitude is shows in Table 2. In respect to practice about BMW management no significant (p<0.05) association was found with age, gender, service duration, branch while significant association (p>0.05) was found with education level, cadre and socio-economic class of participants. In respect to practice behaviour of participants for BMW management, 79% participants score >22 (good score) and 7.40% score between 12-22 (fair score), while only 13.60% score <12 (poor score). Cadre wise practice behaviour of participants is shows in Table 3.

Table 1: Scoring of correct responses related to knowledge regarding BMW Management rules.

Score level		Good (>36)	Fair (18-36)	Poor (<18)
Doctor	N (%)	136 (74.31)	42 (22.95)	5 (2.73)
Nursing staff	N (%)	119 (64.32)	14 (7.56)	52 (2.81)
Lab technician	N (%)	8 (53.33)	1 (6.66)	6 (40)
Class forth	N (%)	19 (50)	7 (18.42)	12 (31.57)
Sweeper	N (%)	35 (44.30)	15 (18.98)	29 (36.7)
Total	N (%)	317 (63.40)	79 (15.80)	104 (20.80)

Table 2: Scoring of correct responses related to attitude regarding BMW management rules.

Score level		Good (>34)	Fair (14-34)	Poor (<14)	P value
Doc-tor	N (%)	162 (88.52)	7 (3.82)	14 (7.65)	0.000
Nursing staff	N (%)	150 (81)	19 (10.27)	16 (8.64)	0.000
Lab technician	N (%)	12 (80)	2 (13.33)	1 (6.66)	0.183
4th class	N (%)	23 (60.52)	10 (26.31)	5 (13.15)	0.824
Sweeper	N (%)	43 (54.43)	24 (30.37)	12 (15.18)	0.000
Overall scoring	N (%)	390 (78)	62 (12.40)	48 (9.60)	

Table 3: Scoring of correct responses related to Practices regarding BMW management rules.

Score level		Good (>22)	Fair (12-22)	Poor (<12)	P value
Doctor	N (%)	158 (86.33)	4 (2.18)	21 (11.47)	0.097
Nursing staff	N (%)	148 (80)	12 (6.48)	25 (13.51)	0.999
Lab technician	N (%)	12 (80)	1 (6.66)	2 (13.33)	0.631
4th class	N (%)	26 (68.42)	6 (15.78)	6 (15.78)	0.918
Sweeper	N (%)	51 (64.55)	14 (17.72)	14 (17.72)	0.000
Overall scoring	N (%)	395 (79)	37 (7.40)	68 (13.60)	

DISCUSSION

The present study was carried out under preventive and social medicine department of SMS Medical College, Jaipur (Rajasthan), India. The study group comprised of medical personnel of various cadre including i.e. doctors, nursing staff, lab technician, forth class worker and sweeper (ancillary staff). In our study majority of participants were male and more than 50% participants were having <10 year service experience this is accordance with the study of Bhagwati et al and Mehta et al.[6,7]

As per education level of participants, 37.4% were graduate while only 18.60% have the post-graduation degree. Contrary to this, Mehta et al found in his study that 4.7% post-graduate and 95.3% graduate. Kumar et al found in his study that 8.36% postgraduate and 33%

graduate education.[7,8] Which can be allowed because of urban background in our study.

In the present study, 63.4% participants were having good score of knowledge. Contrary to this, following studies found good score i.e. Dudi (27.84%), Prashanth (13%).[9,10]

knowledge regarding BMW management rules were 41.2%. This is in accordance with the study conducted by Dudi (44.88%) and Bathma (54.5%).[9,11]

In our study knowledge for hazardous nature of waste were more among doctors (59%) than among nursing staff, lab technicians, forth class workers and sweepers (49%, 47%, 21% and 20% respectively). This is in accordance with the study conducted by in Sharma et al found in his study that 53.57% Doctors, but contrary to this, only 12.5% nurse and 13.33% forth class knows hazardous nature of waste.[12] Bhagwati et al found in his study that knowledge regarding hazardous nature of waste were approximately similar among doctor (63.46%), nurse (57%), but contrary to this, among lab technicians 60%.[6]

In present study, 78% of Participants were having Good Score and 10.25% participants were having poor score for attitude. This is same as study of Dudi and contrary to this, Ranu et al found 26.3% participants with Poor score for attitude.[9,13] This study found that need more attention of participants towards BMW management.

79% of participants were having Good Practice Score (86.33% doctors, 80% nursing staff, 80% lab technicians, 68.42% class 4th and 64.55% sweepers). Contrary to this, Sharma et al found in his study that 20% Doctor, 16% nurse, 5% lab tech and 15% sweepers excellent practice score and Prashanth et al found that 17% nurse, 5% lab tech and 10% forth class have excellent practice score.[10,12]

Discrepancy of various component of knowledge were found in present study with other studies draw attention that regular training of health care personnel is lacking in this region and there is a great need to conduct continuing education and training programs.

Limitations

It has been carried out only at single tertiary care hospital of Jaipur. Sample size less in number (500 participants) looking to existing strength at SMS MC and Hospital (3791). Although the best possible measures were taken to ensure that data collected for research purposes but still considering the questionnaire elucidated self-reported responses of participants and to be sure of their authenticity as general representative of medical personnel working at SMS Hospital.

CONCLUSION

Proper and judicious handling of BMW continues to be a matter of serious concern for health authorities. Gaps in various component of knowledge awareness and practice in between various cadre were found in present study thus we need to reinforce the re-orientation training programs at regular time interval to keep them updated and motivated for BMW management.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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