

Research Article

Knowledge, attitude and practices on biomedical waste and its management among health care workers at a tertiary care hospital in Koppal, Karnataka, India

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ABSTRACT

Background: Biomedical waste carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate handling of such waste may have serious public health consequences and a significant impact on the environment. Health care workers are the key workers in the management of biomedical waste and their inadequate knowledge, unfavorable attitude and poor practices are dangerous for their own health and those in the society. The objective of the present study was to assess the knowledge, attitude and practices on biomedical waste and its management among health care workers in the study setting.

Methods: A cross sectional study was conducted among 162 health care workers at a tertiary care hospital in Koppal district of Karnataka state. Data was collected using a pretested and semi structured questionnaire after taking an informed consent and analysed using WHO Epi info software.

Results: The present study found out that the health care workers had satisfactory level of knowledge, favorable attitude and better practices towards biomedical waste management. However, their practices were not in proportion to the level of their knowledge and attitude.

Conclusions: Regular training, continuous monitoring and behaviour change communication are recommended to improve their biomedical waste handling practices.

Keywords: Attitude, Biomedical waste, Health care workers, Knowledge, Practices

INTRODUCTION

The waste produced in the course of health care activities carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate handling of such waste may have serious public health consequences and a significant impact on the environment. Therefore it becomes essential to have a safe and reliable method for its handling and disposal.¹ Biomedical waste could be defined as “any solid, fluid or liquid waste, including its container and any intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals, in research pertaining thereto, or in the production or

testing of biologicals and the animal waste from slaughter houses or any other like establishments”.²

Over the years there have been tremendous advancements in Health care system. However it is irony that health care settings which restore and maintain community health are also threatening their well-being. Poor and improper waste management practices pose a huge risk to the health of the patients, health care professionals as well as to the general public besides contributing to the environmental degradation.³ With rapid population growth in India, the demand for health-care has increased significantly. As a result, the numbers of hospitals, health centres, small and medium scale nursing homes and

clinics have rapidly increased, generating large quantities of biomedical waste. The problem is further aggravated due to the marked increase in disposable health-care materials.⁴

It is estimated that about 80–85% of waste produced in health care settings is non-infectious general waste, 10% is infectious and the remaining 5% is other hazardous waste. However, if the infectious component gets mixed with the general non-infectious waste, the entire bulk of hospital waste may become infectious.⁵ In India alone, around three million tonnes of health care waste is generated every year and this amount is expected to grow at eight per cent every year.⁶ The greatest risk of biomedical waste is from the infectious and sharp components as health care workers and people associated with handling them are often getting needle prick injuries and can contract infections like HIV/AIDS, Hepatitis B and C.⁷ Other hazards associated with poor waste management include risks associated with hazardous chemicals or drugs and disposables being repacked and sold without being washed. Waste piles also attract variety of disease vectors, including mosquitoes and flies.⁵

Subsequently, Government of India has notified the biomedical waste (management and handling) rules on 20th July 1998 with subsequent amendments (June 2nd 2000, September 2003 and 2011) under the provision of Environment protection act 1986. These rules lay down clear methods for handling and disposal of bio-medical waste and accordingly all the hospitals are now bound to follow these rules to evade legal action. Effective management of biomedical waste is not only a legal necessity but also a social responsibility. The purpose of biomedical waste are mainly to reduce waste generation, to ensure its efficient collection, handling, as well as safe disposal in such a way that it controls infection and improves safety for employees working in the system.⁸ Further, an awareness of proper handling and management of health-care wastes can prevent the spread of infectious diseases and other hazards. With this

background, the present study was undertaken to assess the knowledge, attitude and practices on biomedical waste and its management among health care workers in the study setting.

METHODS

A cross sectional study was conducted for a duration of 5 months from April 2016 to August 2016 among all the health care workers (both medical and paramedical) of a tertiary care hospital in Koppal district of Karnataka state. Prior permission for the study was obtained from the concerned authorities. All the health care workers working in the hospital for more than 6 months were included in the study. Purpose of the study was explained in detail to the participants and data was collected using a pretested and semi structured questionnaire after taking an informed consent. The study was conducted anonymously and those who were not available at the time of data collection were excluded from the study. In the present study, knowledge, attitude and practices were defined as the responses given by the participants to the questionnaire. Data thus obtained were entered in excel sheet and analysed using WHO Epi info software version 3.5.4.

RESULTS

Out of the 162 health care workers included in our study, majority i.e. 94 (58%) were nurses followed by doctors 38 (23.5%) and 30 (18.5%) lab technicians. The age of the study participants ranged from 21 to 58 years with a mean of 28.97 ± 5.99 years. Their experience ranged from 0 to 30 years with a mean of 3.98 ± 4.24 years. Males and females were almost equal in our study. Figure 1 shows the distribution of study subjects according to their gender in different occupations. It is clear from the figure that the number of male participants is more than females among doctors and lesser among nurses, whereas the number of male and female participants is equal among laboratory technicians in our study.

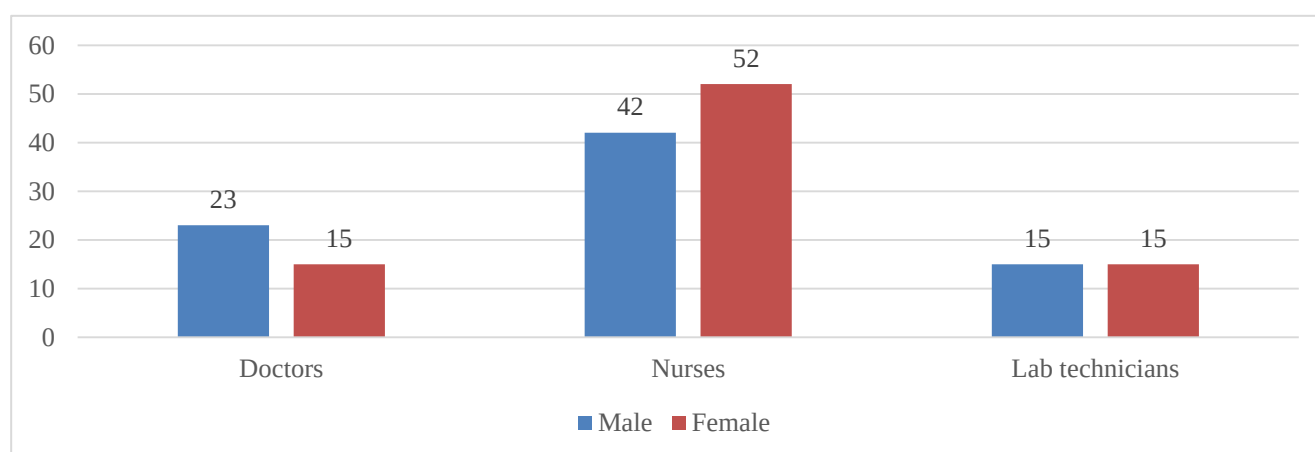


Figure 1: Distribution of study subjects according to their gender in different occupations.

Table 1: Distribution of study subjects according to their correct responses towards knowledge on biomedical waste management.

Sl No.	Questions	Number of respondents N (%)		
		Doctors (n=38)	Nurses (n=94)	Lab Technicians (n=30)
1	Have you ever heard about biomedical waste management?	38 (100)	93 (98.9)	30 (100)
2	Does present hospital generate biomedical waste?	35 (92.1)	80 (85.1)	30 (100)
3	Is there any biomedical waste disposal policy working in present hospital?	26 (68.4)	84 (89.4)	27 (90)
4	Who disposes the biomedical waste generated at present hospital?	6 (15.8)	17 (18.1)	4 (13.3)
5	Is there any hazard associated with biomedical waste?	32 (84.2)	46 (48.9)	25 (83.3)
6	Which of the following is a biomedical hazard symbol?	34 (89.5)	78 (83)	27 (90)
7	Do you know about Colour coding in biomedical waste management?	38 (100)	93 (98.9)	30 (100)
	If yes, how many colour coded containers are there?	30 (78.9)	40 (42.6)	9 (30)
8	As per biomedical waste management rules, waste should not be stored beyond	38 (100)	100 (100)	30 (100)
9	Have you ever heard about universal precautionary measures?	36 (94.7)	70 (74.5)	30 (100)

Table 2: Distribution of study subjects according to their positive attitude towards biomedical waste management.

Sl No.	Questions	Number of respondents N (%)		
		Doctors (n=38)	Nurses (n=94)	Lab Technicians (n=30)
1	Do you think you are at risk of hazard from biomedical waste?	36 (94.7)	72 (76.6)	23 (76.7)
2	Do you think you have a role in biomedical waste management?	37 (97.4)	90 (95.7)	27 (90)
3	Do you think Biomedical waste management is a team work?	38 (100)	84 (89.4)	30 (100)
4	Do you consider safe disposal of health care waste as an extra burden?*	34 (89.5)	43 (45.7)	15 (50)
5	Do you think you need training on biomedical waste management?	35 (92.1)	80 (85.1)	29 (96.7)
6	Do you think you should report to any authority if you get a prick while managing?	34 (89.5)	57 (60.6)	20 (66.7)
	If Yes to whom?	11 (28.9)	23 (24.5)	6 (20)

* Those who responded “No” to this question were considered to have positive attitude.

Table 1 shows the distribution of study subjects according to their correct responses towards knowledge on biomedical waste management. It is clear that the knowledge towards biomedical waste management among all the health care workers is satisfactory except knowledge of waste disposal agency at the hospital which has been assigned to a private organization. Further, the knowledge regarding hazardous nature of biomedical waste was poor among nurses in our study and majority of the nurses and lab technicians could not tell the exact number of containers utilized in biomedical waste management. Only about one third of the doctors, half of

the nurses and two third of the lab technicians in our study had received formal training on biomedical waste management other than their regular curriculum.

Table 2 shows the distribution of study subjects according to their positive attitude towards biomedical waste management. It is evident from the table that more doctors were having positive attitude towards biomedical waste management compared to others in our study and around half of the nurses and lab technicians considered it as an extra burden. Also, one third of them were not aware that they should report if they sustain any needle

prick injury and out of those who told they should report, only few responded correctly to whom they should report. Needle prick injury should be considered as a medical emergency and the affected health care worker should immediately report to the casualty, which was not known to majority in our study.

Table 3 shows the distribution of study subjects according to their correct practices towards biomedical waste management. More than 70% of the health workers

agreed that they segregate waste at the source itself as seen in the table. Majority of them were immunized against Tetanus and Hepatitis B and were using personal protective measures like gloves, masks, aprons, caps etc. Also, their practices regarding segregation of wastes in different colour coded containers were found to be satisfactory. Out of the 162 participants in the study, 13 (8%) agreed to have had sustained a needle prick injury in the last 3 months and only 3 out of them have reported the same to concerned authorities.

Table 3: Distribution of study subjects according to their correct practices towards biomedical waste management.

Sl No.	Questions	Number of respondents N (%)		
		Doctors (n=38)	Nurses (n=94)	Lab Technicians (n=30)
1	Are you segregating biomedical waste at your work place?	27 (71.1)	71 (75.5)	21 (70)
2	Are you using Personal protective measures while handling Biomedical waste?	32 (84.2)	88 (93.6)	27 (90)
3	In which bin, do you dispose general plastic items?	11 (28.9)	32 (34)	10 (33.3)
4	In which bin, do you dispose soiled dressings/ plaster casts/ linen?	20 (52.6)	75 (79.8)	21 (70)
5	In which bin, do you dispose anatomical waste?	18 (47.4)	71 (75.5)	26 (86.7)
6	In which bin, do you dispose sharps and needles?	16 (42.1)	56 (59.6)	23 (76.7)
7	Have you been vaccinated against Hepatitis B?	33 (86.8)	77 (81.9)	29 (96.7)
8	Have you been vaccinated against Tetanus?	35 (92.1)	89 (94.7)	22 (73.3)

DISCUSSION

The management of biomedical waste requires its segregation and removal from the health-care establishments in such a way that it will not be a source of health hazards. Any carelessness in this regard tends to spread infections and contaminate the entire living environment prevailing in a hospital. Health care workers are the key workers in the management of biomedical waste generated in the hospitals and their inadequate knowledge is dangerous for their own health and those in the society.

The present study was conducted among the health care workers working at different levels in a tertiary care hospital. Total participants in the study were 162 which included doctors, nursing staff and laboratory technicians. Majority of the participants were young and male to female ratio was almost equal. Overall awareness and knowledge of Biomedical waste management was satisfactory among all the health workers in our study, comparable to the findings by other studies done in different parts of the country.^{5,8,9} On the contrary few other studies have found out poor level of awareness and knowledge on Biomedical waste management among the participants.^{7,10,11} This could be due to differences in the study settings, differences in job profile and experience of the participants, differences in data collection tools

used etc. Majority of the nurses in our study were unaware about the hazards associated with biomedical waste which conform to the findings by Sengodan et al and Sharma et al.^{4,10} Similarly, majority of the nurses and lab technicians were not knowing the exact number of colour coded containers utilized for biomedical waste management which is similar to the findings by Patil et al and Rajput et al.^{7,12}

More doctors were having positive attitude towards biomedical waste management compared to others in our study similar to the findings of few other studies.^{3,13} Contrary to the findings of our study, the number of nurses and lab technicians having positive attitude towards biomedical waste management was more than resident doctors in a study done by Ajai et al in Tirupati and also, more doctors than nurses and lab technicians considered it as an extra burden in a study by Malini et al.^{6,11} The study also revealed that few of the nursing staff and the lab technicians were not aware about the reporting of needle stick injury similar to the findings of other studies.^{6,10,14,15}

Segregation of biomedical waste was found to be satisfactory among health care workers in our study similar to the findings of few other studies done in different settings.^{3,6,13} However, many other studies have found poor waste management practices among partici-

pants in their studies.^{5,7,9,11} Majority of the participants in our study were immunized against Tetanus and Hepatitis B in line with the findings of the study by Malini done in Puducherry.⁶ However, a study by Patil et al found better vaccination coverage among participants for Tetanus and poorer coverage for Hepatitis B.⁷

CONCLUSION

The present study found out that the health care workers had satisfactory level of knowledge, favourable attitude and better practices towards biomedical waste management. However, their practices were not in proportion to the level of their knowledge and attitude showing a KAP gap which needs to be tackled through regular on job training and sensitization workshops, continuous monitoring and behaviour change communication.

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