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## **STUDY TO ASSESS THE KNOWLEDGE, ATTITUDE AND PRACTICES OF BIOMEDICAL WASTE MANAGEMENT AMONG HEALTH CARE PERSONNEL AT TERTIARY CARE HOSPITAL IN HARYANA**

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### **ABSTRACT**

Inadequate and inappropriate knowledge of handling of healthcare has serious health consequences and a significant impact on the environment as well. Lack of awareness can lead to the hospitals becoming a hub of spreading disease rather than working toward eradicating them. Hence, there is a need for resource material to help administrators, doctors, nurses and paramedical staffs and sanitary workers to aid in proper and safe disposal of waste. The study was conducted at Pt. B.D. Sharma PGIMS, Rohtak during the months of September and October 2013. Study participants included, interns and house officers doctors, nursing staff, laboratory technicians, sanitary workers (ward boys and sweepers) working in the institute and dealing with BMW. The responses to schedule by each participant were entered into excel sheet and data was tabulated and for statistical analysis we calculated percentages and applied the Chi-square test wherever necessary and required. Knowledge score as satisfactory was highest among doctors (86%), followed by nursing staff (70%) and lab technicians (46%). The practice score of BMW was satisfactory in most doctors (90%), nursing staff (78%) and lab technician (68%) and it was poor in 62% of sanitary workers. To tame this shortfalls induction training of newer health care personnel and continuous in-service training programs and periodically evolution of the health care personnel is required.

**Keywords:** *Health Care Personnel, Biomedical Waste, Tertiary Care Center*

### **INTRODUCTION**

India stands second for population count in world. Also Indian health sector annually gets higher burden of patients or clients in terms of DALY'S whether they belong to OPD or In-patients categories (World Health Organization, 2004). Day by day the counts of client/patient keep on piling up. To keep up pace with the increased healthcare needs of this burgeoning population there has been an extravagant growth of healthcare facilities in this country. Due to this high burden, there has been a tremendous increase in the amount waste generation in hospitals/clinics/laboratory.

The Bio-Medical Waste (management and handling) rules, 1998 of India, (BMW) describes bio-medical waste as any solid, fluid, or liquid waste including its containers and any intermediate product which is generated during the diagnosis, treatment, or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological (Park, 2013).

In India it is estimated that annually around 300 million Kg hospital waste is generated with the average waste generation ranging from 0.5 kg to 2.0 kg per bed per day among various hospitals. Almost 75-90% of the wastes are predominantly generated by administrative and housekeeping activities of the healthcare establishment and is non-toxic and fall into general waste category, which can be taken care by municipal authorities. It is the remaining waste (10-25%) that requires special treatment before dumping because they is hazardous category and poses significant public health risks if not properly managed (Central Pollution Control Board, 2010).

A strict adherence to BMW rule is required by all those who are involved in generation, collection, transportation, storage, treatment and disposal of BMW in any manner and also to every institution that generate BMW. The bio medical waste should be segregated at source into color coded bags or containers and its collection and proper disposal should be a significant concern for both medical personnel and the institution involved in such waste generation. Inadequate and inappropriate knowledge of handling of

## **Research Article**

healthcare has serious health consequences and a significant impact on the environment as well. Lack of awareness can lead to the hospitals becoming a hub of spreading disease rather than working toward eradicating them (World Health Organization, 1999).

Effective management of biomedical waste is not only a legal necessity but also a social responsibility. Hence, there is a need for resource material to help administrators, doctors, nurses and paramedical staffs and sanitary workers to aid in proper and safe disposal of waste. The purpose of BMW management 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.

## **MATERIALS AND METHODS**

The study was conducted at Pt. B.D. Sharma PGIMS, Rohtak during the months of September and October 2013. It is tertiary care hospital with daily OPD of around 1 lakh/month and in-patients accounts for on an average of 10,500/month. This hospital serves the patients from district Rohtak and also the adjoining districts etc. This was a hospital based cross sectional study.

The study was conducted by using pre-designed, pre-tested, semi-structured, interview schedule. Study participants included, interns and house officers doctors, nursing staff, laboratory technicians, sanitary workers (ward boys and sweepers) working in the institute and dealing with BMW. They were invited individually to participate in the study after obtaining the informed consent. Equal number of participants were from each of the group were selected as per convenience to make a sample size of 200. The participants were assured of their confidentiality and anonymity.

The interview schedule included details of various socio-demographic variables, like age, sex, educational status, working experience, type of work, and other details regarding knowledge, attitude and practice for bio medical waste handling and its management.

Four different schedules were prepared for each of the four groups focusing on their job profiles. Schedule was divided into three parts with total 39 questions. First part of schedule consisted of 15 questions to assess the knowledge awareness. Scoring was done on the basis of response to each of the question. Score obtained between 0-5, 6-10 and 11-15 were labeled as poor, average and satisfactory knowledge respectively.

Similarly each of second and third part of schedule were having 12 questions to assess attitude and practices awareness and scoring was done on the basis of response to each of the question and score obtained between 0-4, 5-8 and 9-12 were labeled as poor, average and satisfactory attitude and practice respectively.

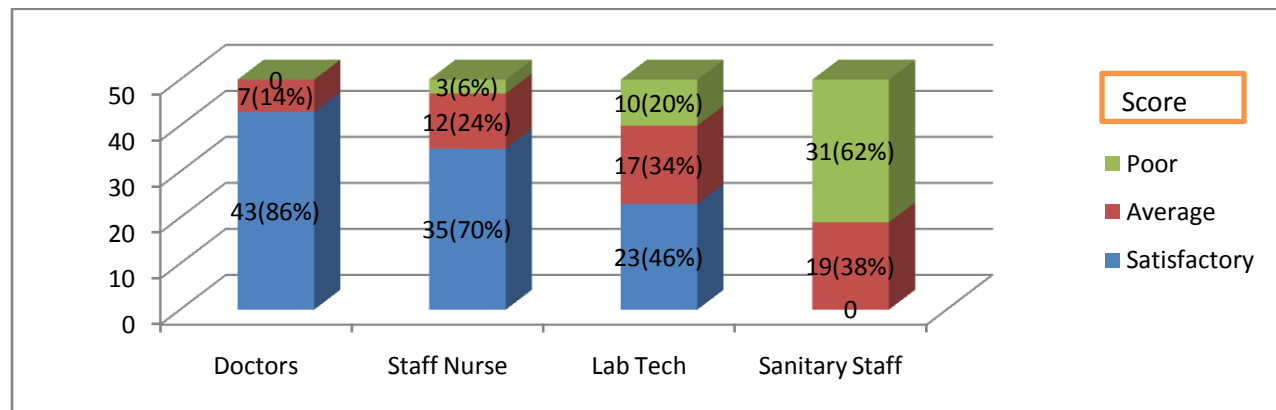
**Statistics:** The responses to schedule by each participant were entered into excel sheet and data was tabulated and for statistical analysis we calculated percentages and applied the Chi-square test wherever necessary and required.

## **RESULTS AND DISCUSSION**

In present study, there was equal participation from each group with 50 participants in each group. The study included 116(58%) female and 84(42%) male participants. The age group of participants ranged between 21-54 years. Majority of our study participants belonged to age group 21-30 years (61%) age group followed by 31-40 years(24%), 41-50 years(11%) and >51 years(4%). More than half of study participants (52%) were working in hospital from 1 to 5 years followed by <1 year (29%), 6-10 years (12.5%) and least belonged to >10 years (6.5%) working experience.

Knowledge awareness score about bio medical waste handling and management related to different groups were presented in Figure 1. Knowledge part of schedule included questions on whether they heard of BMW, details about categories of BMW, awareness of bio hazard symbol, any health hazard of BMW, disease transmitted by BMW, knowledge about color coding of BMW management bags, received any training for BMW, and aware about waste management team, etc.

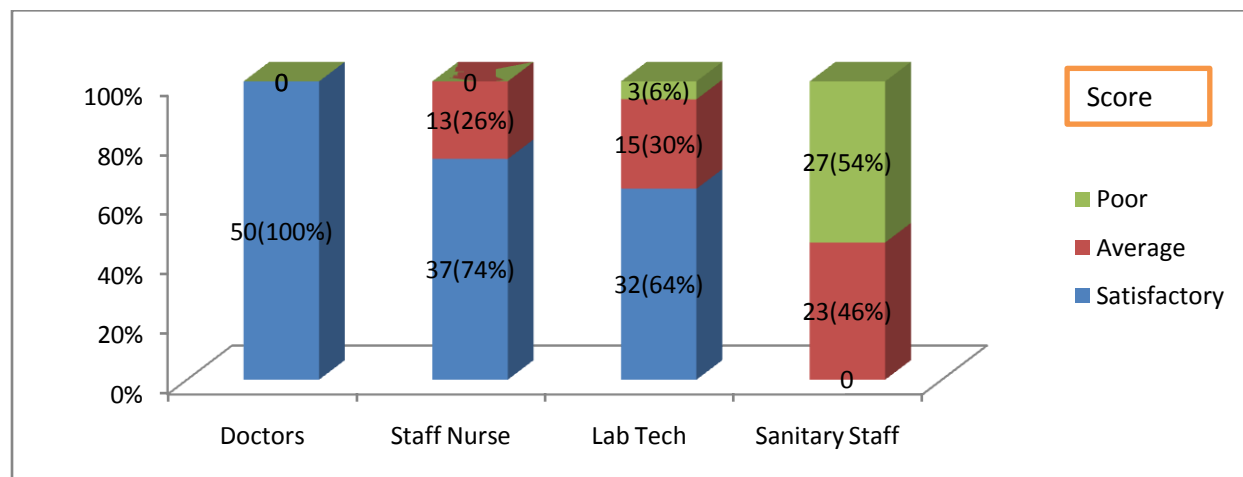
## Research Article



**Figure 1: Knowledge awareness score regarding BMWM among Study subjects**

Knowledge score as satisfactory was highest among doctors (86%), followed by nursing staff (70%) and lab technicians (46%). Average score among more than 30% of participant of each was more frequent in sanitary workers and lab technicians. Among sanitary workers knowledge score was poor in more than 60% of participants.

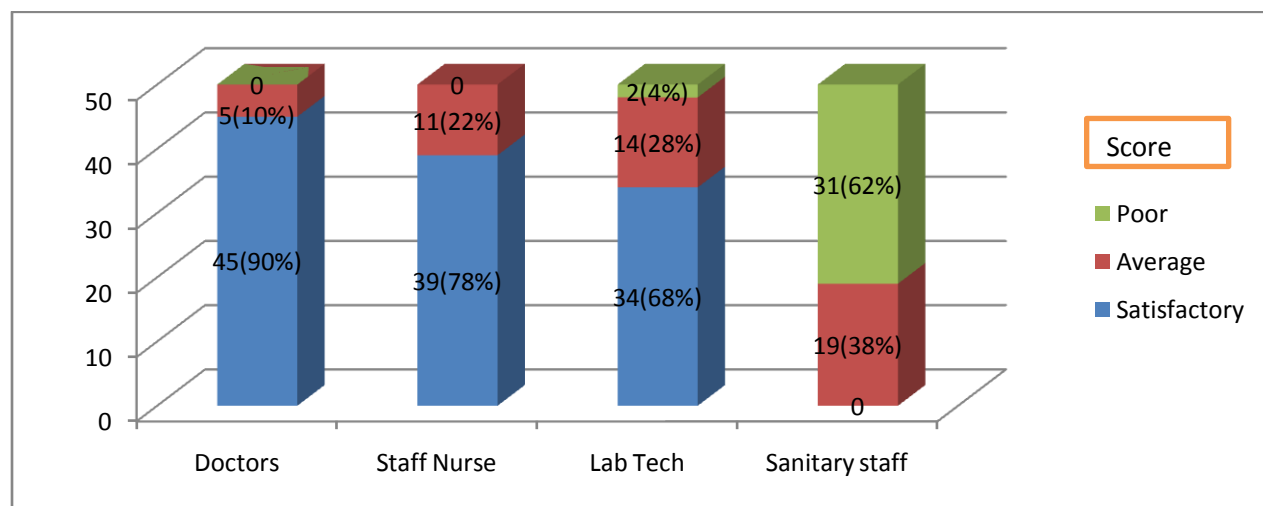
Attitude towards BMWM was assessed on the basis of bunch of few key questions like whether BMWM is an issue or not, if it is sole responsibility of government, BMWM being a team work, if it is an extra burden, whether interested in undergoing training for BMWM, etc. Attitude score towards bio medical waste management among different groups were presented in Figure 2. Attitude score as satisfactory was highest in doctors following those nursing staff (74%) and lab technicians (64%). It was observed that attitude score as poor were among more than half of sanitary workers (54%).



**Figure 2: Attitude score regarding BMWM among Study groups**

Detailed information was collected regarding practice of BMW handling and management among health care personnel and is presented in Figure 3. Details regarding maintaining BMW records at work place, disinfection and segregation done at work place, use of personal protective measures for handling, personal protective measures procured for handling BMW, proper storage facility provided for collecting BMW at work place use of hub cutter, attended training on BMWM, record available for injuries related to BMW, practice regarding different categories (sharp and needle, soiled dressings, glass plastic waste and human anatomical waste) disposal were collected from the health care personnel. The practice score of BMWM was satisfactory in most doctors (90%), nursing staff (78%) and lab technician (68%) and it was poor in 62% of sanitary workers.

## Research Article



**Figure 3: Practices awareness regarding BMWM among Study groups**

The present study was conducted among health care personnel at a tertiary care hospital. The study participants included house-surgeons & intern doctors, nursing staff, laboratory technicians and sanitary staff. Total 200 health care personnel participated in the study.

In present study females (58%) were the major participants, as all the staff nurses were females. Majority of study participants belonged to the 21-30 age group (61%). This was because of the fact that one fourth of our participants were house-surgeons and intern doctors and almost all of them were in that age group. As the house-surgeons, interns and nursing staff, formed more than three fourth of study participants (79%) work experience in hospital mostly ranged from less than one year to 5 years.

Most of the house surgeon and intern had satisfactory knowledge (86%) about BMW management. This can be credited to the due importance being given to the topic in the MBBS curriculum. The knowledge of nursing staff was appreciable and similar reasons can be attributed to this (70%). Unfortunately less than fifty percent of the lab technicians (46%) did not have proper knowledge. The results were similar to results of Verma *et al.*, (2014). Study done in rural area of Haryana where knowledge awareness among doctors and nursing staff was 86.7% and 73.1% respectively (Verma *et al.*, 2014). The present study findings are in agreement with other study (Yadavannavar *et al.*, 2010), but is in contrast to Pandit *et al.*, study (2005).

Similar to results of the study done by Bala *et al.*, (2013), our study also showed only 62% of sanitary worker as having satisfactory knowledge. The reason could be that most of them are on contract basis and were not as much as fortunate to get repeated training compared to doctors and nursing staff and lab technicians. Though overall knowledge of study participants was good but there is still a need of good quality training to improve their current knowledge about BMW and especially main emphasis should be focused on training of sanitary workers at regular time interval (Mathur *et al.*, 2011), (Kishore *et al.*,; Goel, 2000).

Attitude goes a long way in deciding our work practices. A positive attitude shapes into better output. In our study attitude score for BMWM and handling was satisfactory in maximum number of doctors following those nursing staff (74%) and lab technicians (64%). This also corroborates with the fact that these group workers also showed good practices.

Similar to knowledge awareness, attitude score was poor in half of sanitary workers. This is in agreement with Tenglikar *et al.*, (2012). Study where doctors and nursing staff compared to housing staff had statistically significant difference ( $p < 0.001$ ) in attitude score. Also study of Sachan *et al.*, (2012) showed attitude positive in maximum number of doctors (100%) and 60% of nursing staff. These findings are in contrast to the study conducted by Saini *et al.*, (2005).

## **Research Article**

It can be well judged from the results that practice score of BMW was mostly satisfactory in doctors (90%), nursing staff (78%) and lab technician (68%) but overall assessment about practices related to BMW management suggested that they need good quality training periodically. Again the practice score was poor in case of sanitary workers (62%) and reason for this could be that they are having poor knowledge and attitude. Similar results were seen in the study of Sachan *et al.*, (2012) and Bhatt *et al.*, (2013). Where more than two third doctors and nursing staff were having correct practices.

## **Suggestions**

To improve overall knowledge, attitude and practices related to BMW management and its handling of steps like, strict implementation of bio medical waste management rules; compulsory training for their health care personnel from accredited training centers. Proper BMW disposal practices could be accentuated in health care personnel if they are put under direct supervision and direct surveillance. It is not possible to depute one person for this work in each ward or OPD etc. To overcome such impossibility there should be surveillance with the help of CCTVs (closed-circuit televisions) especially where is most of BMW generation, segregation and its disposal. Those who are found doing incorrect practice should be given additional attention and training. Easy color coding for BMW disposal bags should be developed in local languages for the betterment of sanitary workers and general public awareness. Local language should be used for coding method for segregation of BMW. The education of the general public is also indispensable. Yielding posters with and leaflets should be used to for providing such education. Conduction of workshops on Biomedical waste management and handling in colleges and should include participation from each health care personnel.

## **Conclusion**

The study showed good awareness among doctors, nursing staff and lab technician, but there were also shortfall which was well demonstrated from awareness level of sanitary workers. Based on the observation, the importance of training regarding bio medical waste management can't be overemphasized. Lack of proper and complete knowledge about bio-medical waste management impacts practices of appropriate waste disposal. To tame this shortfalls induction training of newer health care personnel and continuous in-service training programs and periodically evolution of the health care personnel is required.

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