Knowledge Regarding Biomedical Waste Management among the Staff Nurses

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Abstract: *<u>Background</u>: Biomedical waste means any waste which is generated during the diagnosis, treatment or immunization of human beings or research activities pertaining their production or testing of human anatomical waste, animal waste, microbiology and biotechnological wastes, waste sharps, discarded medicine and cytotoxic drugs, solid wastes liquid waste incineration ash, chemical waste etc. So inadequate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the patients and their environment. The objective was to assess the knowledge of staff nurses regarding biomedical waste management. <u>Materials and Methods</u>: The study was conducted at SSH, BHU Varanasi. It was a descriptive and cross-sectional study. A total of 50 staff nurses participated in the present study, randomly chosen from various departments. <u>Results</u>: Showed that the staff nurses had average knowledge regarding biomedical waste management. The planned teaching programme was found effective because post test knowledge was better than the pre test knowledge score among staff nurses. <u>Conclusion</u>: Nurses should be given a opportunity to update their knowledge regarding bio-medical waste management so that the importance of training regarding biomedical waste management needs emphasis; lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal.*

Keywords: Biomedical waste management, Staff nurses, Knowledge, Structured teaching programme, Effectiveness.

1. Introduction

Hospitals are the centre of cure and also the important centres of infectious waste generation. Effective management of Biomedical Waste (BMW) is not only a legal necessity but also a social responsibility. The most common problems associated with health care waste are the absence of waste management, lack of awareness about their health hazards, insufficient financial and human resources for proper management and poor control of waste disposal to protect the environment and health of the community, the Ministry of Environment and Forestry has notified „Biomedical waste rules 1998‟. All hospital , clinics ,nursing homes, community health centres, PHCS, laboratories have to ensure safe disposal and environmentally sound management of waste produced by them as specified in rules for proper disposal of biomedical waste. It is responsibilities of the head of health care facilities to safeguard the health of workers involved in handling, transportations and disposal of biomedical waste besides ensuring safety to the community and environment.

The wastes are potential sources of infection transmission, especially hepatitis B and C, HIV, tetanus approximately 1.4 kg per bed per day waste is generated in Indian hospital and as high as 4.5 kg per bed per day in developed country like USA and approximately 15 % of waste is hazardous and 85% non hazardous, out of 15% of hazardous waste 5% is non infective and 10% infective (Babu et al , 2009).

According to WHO (2011), the inappropriate healthcare waste management globally 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.

The Nurses spend maximum time with patients in the ward than any other member of the health team, it increases their exposure and risk to the hazards present in hospital environment, mainly from Bio-Medical Waste. They need to be well equipped with latest information, skills and practices in managing this waste besides reducing hospital-acquired infections to protect their own health. They are also responsible for preventing risk due to waste to the other members of health team and community at large (AFACFO, 2002). The improper management in bio-medical waste causes environmental problems that causes to air, water and land pollution.

It has been found that one third of sharp injuries are related to disposal process. Investigator experienced that most of nursing staff had limited knowledge about bio medical waste management. So there is a need to up-to-date their knowledge and practices of bio medical waste management. So investigator felt that awareness through teaching programme is effective way for nursing students to equip themselves with latest information about skills and practices in biomedical waste management, which help them to work effectively in the hospital.

Although, there is an increased global awareness among the staff nurses about the hazards and also appropriate management techniques but the level of awareness in India is found to be unsatisfactory, so sound knowledge and safe practices among all staff nurses need to be strengthened.

2. Objective

The objective of the study was to assess the Knowledge regarding biomedical waste management among the Staff Nurses in Banaras Hindu University, Varanasi, Uttar

Pradesh, India. The hospital chosen for the study is a tertiary level hospital in Uttar Pradesh. Therefore, the current status of staff Nurse's awareness regarding BMW management will help the authorities to develop the strategy for improving the situation in future.

3. Material and Methods

A cross-sectional study was conducted among the staff Nurses of Sir Sunder Lal Hospital, Banaras Hindu University, Varanasi, Uttar Pradesh, India. A total of 50 Staff Nurses consented for interview. Purposive sampling technique was used to select the study unit. A predesigned and pretested questionnaire for Knowledge regarding biomedical waste management study was used for data collection. Study proforma contains 24 questions concerning the knowledge and practice on the subject. Each correct question scores one mark. Self-made scoring system was used to categorize the participants as having good, average, poor and very poor scores. In our study, knowledge is defined as the written response of the health care professionals on the structured questionnaire prepared by the investigators on biomedical waste management. In our study, it is assumed that the staff Nurses will have knowledge about biomedical waste management. It is also assumed that individuals involved in the study will cooperate and give correct information. The study is delimited to the staff Nurses who are working in Sir Sunder Lal Hospital, BHU at the time of data collection. Data were collected, compiled, tabulated and analyzed using SPSS 16.0 version for calculation.

Analysis of data both descriptive and inferential statistics analyzed on the basis of the objectives and hypotheses of the study. The knowledge of nurses regarding Bio-medical waste management assessed before and after the administration of Planned teaching programme would be calculated using mean, median, range and standard deviation. The significance of difference between the mean pre-test and post-test knowledge score of Staff nurses would be calculated using paired 't' test. The association between demographic variables and pre-test knowledge score

regarding biomedical waste management would be determined by chi-square test. Data presented in the form of tables and figure.

4. Results

This study was conducted among 50 staff Nurses of Sir Sunder Lal Hospital, BHU, Varanasi regarding the knowledge on hospital waste management. Nurses are the backbone of hospital management. Socio-demographic variables reveal that Majority 52% of the subjects had age group of 18-19 years. Majority of subjects 92% female. 80% subjects had taken education up to graduation level. 98% of the subjects were married. 94% of the subjects were living in residence and remaining 6% were stayed in the Hostel. 70.0% of the staff Nurses Clinical experience was above 10 yrs and 30% of staff Nurses were having below 10 yrs Clinical experience. The finding related to previously attended BMWM programme, about 56.7% of Nurses attended BMWM programme and 43.3% of Nurses not attended any programme or seminar related to Bio-medical Waste Management. There was no significant difference between pre test knowledge score and selected demographic variables with respect to age, sex, education, marital status and residence.

The statistical results of our study, indicate that the knowledge of staff Nurses regarding biomedical waste management is more in the post test followed by the pre test knowledge score. The mean and standard deviation (SD) of these scores and the p-values are shown in table

Table: Details of scores of the study participant

Knowledge Area	Mean	Standard Deviation	"t" Value	p – value
Pre-test	17.0	2.25	13.8	<0.01
Post-test	21.94	1.20		

p-value showed the difference between the Pre-test and Post-test scores was highly significant in knowledge score thus the Planned Teaching Programme on Bio-Medical Waste Management was effective.
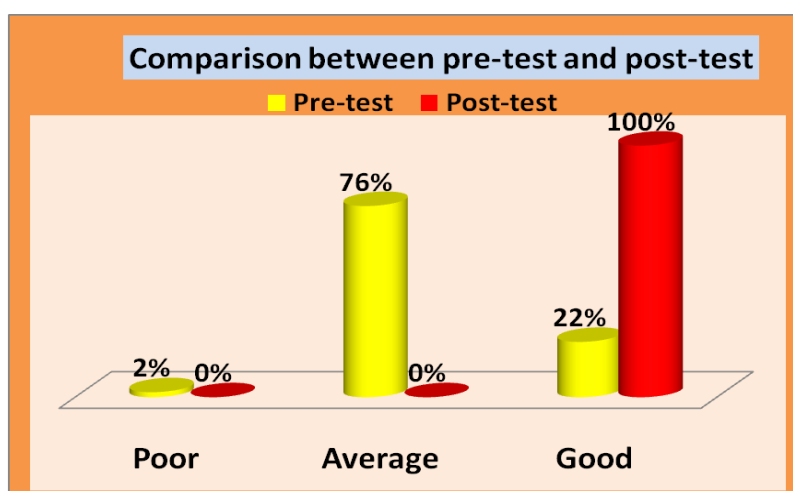
Figure: Bar diagram shows comparison between pre test and post test knowledge score of Planned Teaching Programme regarding Bio-Medical Waste Management

5. Discussion

This cross-sectional study targeted at assessing the knowledge about the hospital waste management. The lower level of knowledge about hospital waste handling may have direct impact on the overall process of safe disposal of hospital waste which may lead to spread of disease.

In this study, the knowledge regarding biomedical waste management of staff nurses working in the hospital. The knowledge of staff Nurses regarding biomedical waste management is more in the post test followed by the pre test knowledge score. The findings compare with the study conducted by Deo et al (2006), in which the average score is highest in the nursing staff. According to assols and Campillo (2003) Post-test knowledge scores were significantly higher than the pre-test. Highest percentage of effectiveness was noted in the area of safety practices and lowest percentage of effectiveness in the area of hazards of biomedical waste management. The researcher concluded that the information booklet was found highly acceptable and useful by nursing personnel.

In 2006, Mohideen (2010) conducted a study in Karnataka in South India to assess the Knowledge Attitude and Practice of nurses regarding on biomedical waste management. This study revealed that the training program on biomedical waste management is necessary for staff. Knowledge Attitude and practice study conducted in northern India by Mathur et al (2011), this study also recommended compulsory continuous training for the healthcare personals in accredited training centres. All health care institutions are required to handle bio=medical waste in a specified manner.

6. Conclusion

The management of bio-medical waste is still in its infancy stage. The findings of this study have been discussed with reference to the objectives and hypothesis. The pre testing of nurse''s knowledge regarding Bio Medical Waste management shows that nurses have less knowledge about Bio Medical waste management. This indicates the need for imparting necessary education and information regarding Bio Medical Waste Management.

For this, there is a need for intensive training programs at regular time interval to repeatedly train and retrain all the staff nurses, which may include question raising and problem solving approach. Score cards may be introduced in the work certificate which will record the proper Bio Medical Waste Management practice monitored by departmental authority. There should be an inspecting body in hospital itself to check the violation of Bio Medical Waste Management rules.

7. Acknowledgement

8. Limitations of the Study

The following points were beyond the control of the investigator.
1) The study is limited to small sample size
2) The assessment of effect of the PTP is limited to one group pre and post-test conducted on the 7th day.

9. Recommendations

Based on the findings of the present study recommendations offered for the future study are:
- A similar study can be done on a larger sample.
- A study can be done among other hospital employees.
- A study may be conducted to evaluate the effectiveness of PTP versus other methods of health teaching on the similar topic.
- A comparative study can be done in urban and rural community and different large hospitals, Private hospitals and Govt. hospitals.
- A similar study can be done in more depth.
- A similar study can be replicated in different setting to strengthen the findings

10. Source of Support

Nil

11. Conflict of interest

The author had no relationship/condition/circumstances that present a potential conflict of interest.

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