An effectiveness of the teaching module on Knowledge and practice regarding biomedical waste management (BWM) among staff nurses at selected tertiary hospital, Lucknow, UP

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Abstract

Introduction: Improper hospital waste management has a serious impact on our environment. Apart from the risk of water, air and soil pollution, it has the considerable impact on human health.

Aim of Study: To understand the knowledge and practice of staff nurses and to be educated regarding biomedical waste management.

Objective: To assess the pretest knowledge and practice, determine the effectiveness of the teaching module and the relationship between pretest knowledge with sociodemographic variables.

Material and Methods: Undertaken to assess the knowledge and practice of staff nurses regarding biomedical waste management in the tertiary unit. An evaluative research approach one group pre-test and post design was used. The samples were selected using convenient sampling technique; a total of 30 samples were selected to assess the knowledge and practice skills. Knowledge was assessed by structured knowledge questionnaires and a practice skill is assessed by observation checklist. The data was collected, analyzed and interpreted by using descriptive and inferential statistic in SPSS version 16.

Results: In pretest poor knowledge 1(3.3%), moderate knowledge was 25(83.3%) and Good knowledge was 4(13.4%), a Post-test assessment was done after one week of intervention and all participant had good knowledge. Pretest practice had assessed by observation checklist 22(73.3%) had inadequate knowledge and 8(26.7%) had Adequate knowledge. The post-test practice was assessed after one week of teaching intervention post-test score was 100% all the staff nurses gained the good practice skills. Pre-test mean and the standard deviation was 12.63±2.59, and post-test was conducted after teaching intervention to mean and SD 18.53±1.907. The mean difference was 5.9 and the mean percentage was 28.8, the paired t-test was -9.29 and Wilcoxon signed rank test was -4.68. Therefore the teaching module on BMW management of practice was more effective. Significance pre-test knowledge difference was found in gender and experience of the participant at 0.05level. So that researcher was concluded that update the knowledge regarding biomedical waste management is an integral part of continuing nursing education.

Keyword: Knowledge, Practice biomedical waste, Teaching module.

Introduction

When patient care activities are carried out in a healthcare setting, certain waste is produced which has the potential to cause harm to human beings and environment. Such waste includes soiled cotton, bandages, hypodermic needles, syringes, tubing such as intravenous sets, and urinary catheters etc. Such waste is commonly called as bio-medical waste BMW in India, though it is also known by various other names such as clinical waste, medical waste and health-care waste in different parts of world. Such waste constitutes merely 15 to 25% of total waste generated in a hospital, the remaining being general waste such as waste paper, wrapper of drugs, cardboard and left-over food etc. The general waste is treated by local municipality in same way as house-hold waste, but special precautions and treatment modalities are required for BMW, so that it does not cause any harm to human beings and environment. Though as many as 40 pathogens have been documented to be transmitted by BMW , its well documented propensity to cause transmission of 3 pathogens namely Human Immunodeficiency Virus , Hepatitis B Virusand Hepatitis C Virus makes it essential that due care is exercised while handling and disposing it.[1,2]

There are primarily 4 broad functions for BMW management at source of generation, viz. placement of waste receptacles or bins lined with waste bags at source of generation, segregation of waste, mutilation of recyclable waste and disinfection of waste. It is highly desirable for a Hospital Administrator to know the weak points in the chain of waste management so that these could be addressed appropriately. Keeping this in view, the present study was conducted with the aim to evaluate BMW management practices at source of generation in an1100-bedded hospital of a tertiary care referral public hospital of North India.[1-3]

Good health depends in part on a safe environment. Practices or techniques that control or prevent transmission of infection help to protect clients and health care workers from disease. Clients in all health care settings are at risk for acquiring infections. The last decade witnessed a significant increase of public concern regarding biomedical waste disposal.This was fuelled by the reports of "beach washing" of medical waste on the coasts of Florida and gulf, and the

"recycling" of disposal articles in developing countries.[4,5]

The reports and figures available from developed countries indicate that approximately 1-5 kg of waste is generated per bed per day in developing countries.In India it is estimated to be 2.0 kg per bed per day.The concern regarding the medical waste is mainly due to the presence of pathogenic organisms and organic substances in hospital solid wastes in significantly high in concentration.[6,7,10,]

Improper hospital waste management has serious impact on our environment.Apart from the risk of water, air and soil pollution, it has considerable impact on human health.According to the WHO report around 85% of the hospital wastes is actually non- hazardous, 10% are infective and the remaining 5% is non-infectious but hazardous (chemical), pharmaceutical and radioactive.[11,12]

Material and Methods

A study was undertaken to assess the knowledge and practice of staff nurses regarding biomedical waste management at Sanjay Gandhi Post Graduate Institute of Medical Sciences Lucknow Uttar Pradesh. Evaluative research approach one group pre-test and post design was adopted. The samples were selected using convenient sampling technique; the total of 30 samples selected and assess the knowledge and practice skills regarding biomedical waste management. Knowledge was assessed by structured knowledge questionnaires and a practice skill is assessed by observation checklist. Before gathering information from the participant the researcher is explained the study and data anonymity, and also explained the purpose of the study. The data was collected, analyzed and interpreted by using descriptive and inferential statistic in SPSS version 16.

Results

Table1: Frequency and percentages in pre-test and post

S.N	Item	Variable	Pre-test		Post-test	
			Frequency	Percentage	Frequency	Percentage
1	Knowledge	Poor	1	3.3	0	0
		Moderate	25	83.3	0	0
		Good	04	13.4	30	100
2	Practice	Inadequate	22	73.3	0	0
		Adequate	08	26.7	30	100

n-30

Table 1 show that staff nurse's knowledge regarding BMW was categorized into poor knowledge, moderate knowledge, and Good knowledge.Assessed the pre-test knowledge by knowledge questionnaire was found that poor knowledge was 1(3.3%), moderate knowledge was 25(83.3%) and Good knowledge was 4(13.4%), a Post-test assessment was done after one week of intervention and all participant had good knowledge. Therefore the teaching module on BMW management of knowledge was more effective.

The practice was assessed by observation checklist, and practice was categorized into adequate and inadequate. Pretest practice had assessed by observation checklist 22(73.3%) had inadequate knowledge and 8(26.7%) had Adequate knowledge. The post-test practice was assessed after one week of teaching intervention post-test score was 100% all the staff nurses gained the good practice skills. Therefore the teaching module on BMW management of practice was more effective.

Table 2: Mean,SD,Mean difference,percentage and paired t-test nurses knowledge on BMWM

S. N.	Item	Pre-test		Post-test		Mean difference	Mean %	Paired Test t-value(0.01)
		Mean	SD	Mean	SD			
1	Knowledge	12.63	2.593	18.53	1.90	5.9	26.8	-9.29

n=30

Table 2 show that pre-test mean and standard deviation was 12.63±2.59,post-test was conducted after teaching intervention mean 18.53±1.90.The mean difference was 5.9 and mean percentage was 28.8,the paired t-test was -9.29.Hence teaching module enhanced the staff nurses knowledge.

Table3: Median, interquartile range and Wilcoxon signed rank test

S.No		Median	Interquartile range	Wilcoxon signed rank
1	Pre-test	9	8-11	-4.68
2	Post-test	13	12-15	

n-30

The table 3 shows that the practice skills of nurses, pre-test median was 9 and interquartile range 8-11 in the pretest. The post-test observation was made after one week of intervention median was 13 and the interquartile range was 12-15. The effectiveness of the teaching intervention is assessed by Wilcoxon signed rank test was -4.68, after teaching intervention increased the practice skills of staff nurses.

Table4:Frequency, percentages and Chi-square of socio demographic variable with knowledge

S.No	Demographic characteristics	Frequency and percentage			df	chi-square value
		Category	f	%		
1	Age in year	19-23 year	24	80	6	3.521
		24-28 year	2	6.66		NS
		29-33 year	2	6.66		
		above 34 year	2	6.66		
2	Gender	Male	5	25	2	12.0*
		Female	25	75		
3	Job entertain	Permanent	22	73.3	2	2.89
		Out source	8	26.7		NS
4	Qualification	Diploma	8	26.7	2	4.17
		Graduation	22	73.3		NS
5	Experience	1-3 years	16	53.3	2	8.70*
		4-6 years	14	46.7		
6	Previous knowledge	Yes	27	90	2	1.66
		No	3	10		NS
7	If yes	CNE	26	86.7	2	2.30
		seminar	4	13.3		NS

n-30

The table 4 shows that characteristics of the sample, the majority of the participants' age ranged between 19-23years 24(80%), by gender female are more than male 25(75%). Job entertain majority of the participants are permanent post 22(73.3%) and they were nursing graduate from the recognized university. The year experience in teaching institution most of the participants having a less than 3 years' experience 16(53.3%) and the majority of the nurses had previous knowledge obtained from continuing nursing education.

From the table 4, it is found that there is a statistically significant association in the knowledge level of staff nurses with gender ($\chi2$=12.0*), experience (($\chi2$=8.70). The remaining variables like Age, job entertain, Qualification, Previous knowledge, were found to be non-significant.so that gender and experience of staff nurses are associated with knowledge on biomedical waste management

Discussion

This study has done to evaluate the knowledge on biomedical waste management among the nurses who are working in at,SGPGIMS,Lucknow. Since nurses, handle healthcare wastes at a major level, and this study mainly focused to assess the knowledge and to recommend necessary implication programme needed on biomedical waste management in hospital.The Biomedical waste management rules, 1998 formulated by the Indian Government has given regulations about the handling, storage, transportation and final disposal of the healthcare wastes.[14,17]

This study found thatafter teaching intervention 100% nurses had adequate knowledge on biomedical waste management. Similar study was conducted by Gupta et.al found that the knowledgeof nursing staff was appreciable 70%. Also nurses from rural area of Haryana staff had 73% knowledge and awareness on biomedical waste management.[15]

The findings of the study would help the nurse practitioner to develop a new vision in control infection through proper segregation of hospital waste and control of infections and injuries related to that. The findings of the study recommended the educationalists at various institutions to emphasize the importance of proper segregation of biomedical waste in hospitals to control infections. The nursing students can be provided with opportunities to implement during their clinical exposure.

The nurse as an administrator can organize and conduct various training programs on Bio medical waste management to nurses and fourth class workers, which will enhance their knowledge and keep them aware of proper segregation of waste in the respective areas.

Conclusion

Nurses' is an integral part in health care delivery system hence nurses to be required periodically comprehensive training programs regarding handling,

segregation, transportation & storage of hospital waste in color bins until final disposal and treatment, all hospital staff is highly recommended to deal with this burning issue of bio-medical waste management.

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