

EFFECTIVENESS OF STRUCTURE TEACHING PROGRAM ON CHANGES IN BIO MEDICAL WASTE MANAGEMENT AMONG STAFF NURSES IN ERA HOSPITAL

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Abstract

All the human activities produce waste, which may be dangerous and need safe disposal. Hospital and other health care facilities generate lots of waste which can transmit infection particularly HIV and Hepatitis B, particularly to those who handle it. Many studies have proved that awareness through teaching program may be effective way for the nurses to equip themselves with the latest information, skills and practice in managing the biomedical waste besides reducing hospital acquired infection. **To** determine pre – interventional knowledge regarding changes in bio- medical waste management among staff nurses., **To** assess post – interventional knowledge regarding changes in bio-medical waste management among staff nurses., **To** compare pre and post interventional knowledge regarding changes in bio waste management among staff nurses., **To** find the association between changes in bio-medical waste management with selected demographic variable. An evaluator approach with one group pretest post-test design was used for the study. sixty staff nurses were selected using non-probability purposive sampling technique. Pretest knowledge questionnaire was administered following which a planned teaching program was conducted. Post-test was conducted on the eighth day by administering the same tool. The study findings revealed that knowledge scores of staff nurses were inadequate before the administration of planned teaching program. The planned teaching program facilitated them to update their knowledge related to biomedical waste management. Post-test knowledge scores of the staff nurses significantly increased after the planned teaching program. Hence the planned teaching program was an effective teaching strategy to improve the knowledge of staff nurses on biomedical waste management.

Keywords: Biomedical waste management; staff nurses; knowledge; Effectiveness; planned teaching program.

INTRODUCTION

Hospitals generate substantial quantity of wastes that has potential to cause health and environmental hazards. In order to streamline the waste collection, processing and disposal practices, the Government of India has been revising the rules from time to time. On March 28, 2016, the Government of India published the “Biomedical Waste Management Rules, 2016” in supersession of the Biomedical Waste (Manage

ment and Handling) Rules, 1998. In the new Biomedical Waste Management Rules, 2016, several changes and additions have been made to further improve the collection, segregation, processing, treatment and disposal of the biomedical wastes in an environmentally sound manner. Under the new regime, the coverage has been increased to include vaccination camps, blood donation camps, surgical camps etc. and also provision for pre-treatment of lab waste, blood samples, etc. It has simplified the process of categorization of waste and authorization. The rules

clearly delineate the duties of occupier i.e. healthcare facility and operator of common biomedical waste treatment facility. In the public interest, the Biomedical waste management rules, 2016 have been further amended on March 28, 2018 as “Bio-Medical Waste Management (Amendment) Rules, 2018”.

According to WHO,

- ☒ Nearly 85% of all waste generated by hospital is general waste.
- ☒ About 15% waste is Bio-medical Waste, which includes
- ☒ Infectious waste - 10%.
- ☒ Non-infectious waste such as radioactive and chemical wastes - 5%.

In a large tertiary care hospital in India, the waste generated is about 1-2 kg/bed/day as against 2.8 kg/bed/day from a similar sized hospital in USA.

NEED OF STUDY

Health care provides being the important professional who works collaborators with health care team have lots of responsibility in knowing the categories of hospital waste, segregation and practices management correct disposal on hospital waste helps in the reduction on nosocomial infection. **Manyele., et al.** conducted a study on the management of medical- waste in Tanzanian hospitals. A questionnaire was circulated to collect their information. Their analysis revealed that the main disposal methods comprised of open pit burning (50%), burying (30%) of waste and 71% of hospital used drugs. The transporting waste from generation points to increase without plastic bags and they concluded that hospital waste management by a hospital is poor. So they arranged for proper training and management regarding awareness and practices of hospital waste management to all cadres of health-workers

STATEMENT OF THE PROBLEM

Effectiveness of structure teaching program on changes in bio medical waste management among staff nurses in Era hospital.

OBJECTIVES

1. To determine pre -interventional knowledge regarding changes in bio- medical waste management among staff nurses.
2. To assess post - interventional knowledge regarding changes in bio-medical waste management among staff nurses
3. To compare pre and post interventional knowledge regarding changes in bio waste management among staff nurses
4. To find the association between changes in bio- medical waste management with selected demographic variable.

ASSUMPTIONS

The study assumes that:

1. Nurses working in a selected hospital have some knowledge regarding biomedical waste management.
2. Nurses have potential to learn about biomedical waste management.
3. Knowledge on biomedical waste management is measurable.
4. Planned teaching program is an effective way to improve

HYPOTHESIS

To achieve the stated objectives following hypothesis has been developed which will be tested at 0.05 level of significance:

H₁: The mean posttest knowledge scores on biomedical waste management of nurses who have undergone Planned Teaching Programme will be significantly higher than their mean pretest knowledge scores

H₂: there will be statistically significant association between knowledge regarding bio medical waste management with their selected socio demographic variable among staff nurses.

H₀: there will be no statistically significant association between knowledge bio medical waste management with their selected socio demographic variable among staff nurses.

DELIMITATIONS OF THE STUDY

1. The study is delimited to the hospital, which is selected conveniently for data collection.
2. The staff nurses working in the Era hospital

REVIEW RELATED TO BIO- MEDICAL WASTE

Anna Abraham (2016) conducted a cross-sectional study on Awareness, Knowledge and Practices on Bio-Medical Waste Management Among Health Care Professionals in Mangalore. The study was conducted using a pre-tested questionnaire to assess the awareness, knowledge and practices on medical waste management among health care personnel in different health care settings in Mangalore city, Doctors, nurses, and laboratory technicians have better knowledge than sanitary staff regarding biomedical waste management. Knowledge regarding the color coding and waste segregation was found to be better among nurses and laboratory staff as compared to doctors. The management of hospital 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 to those who are directly or indirectly related to the hospital environment. The segregation of waste in almost all hospitals is not satisfactory. Proper and judicious handling of Bio medical waste continues to be a matter of serious concern for health authorities in India.

REVIEWS RELATED STRUCTURE TEACHING PROGRAMME

Dr.N.Gayathri, 2018 pre experimental one group pretest and posttest design was adopted to assess the effectiveness of structured teaching programme on knowledge of hospital waste management among senior nursing. This study showed that pretest 2% students had adequate knowledge on concept and classification of hospital waste, and 4% students had adequate knowledge of practice. In post test 98% students had adequate knowledge regarding and classification, 88% students had adequate knowledge in handling, storing, treating and 79% students had adequate knowledge of practice about hospital waste. In remote memory assessment test 94% students had adequate knowledge in concept and classification, 85% students had adequate knowledge regarding handling, storing and treating the hospital waste and 75% students had adequate knowledge of practice

REVIEW OF LITERATURE RELATED TO STAFF NURSES

Shamim Haider et al 2015 : It was a descriptive, hospital based, cross-sectional study. A total of 240 nurses participated in the present study, randomly chosen from various departments A pre-designed, pre-tested, structured proforma was used for data collection after getting their informed consent. Self-made scoring system was used to categorize the participants as having good, average and poor scores. Data was tabulated and analyzed using percentages and chi-square test .this

findings showed overall knowledge of study participants was good but still they need good quality training to improve their current knowledge about BMW.

RESEARCH METHODOLOGY

Research methods refer to steps, procedures and strategies for gathering and analyzing data in a research involved. Research methodology is a way to systematically solve the research problem. It is a science of studying how research is done scientifically. This chapter describes the methodology adopted for evaluating the effectiveness of planned teaching programme changes on Biomedical Waste Management. The Methodology includes research approach, research design, settings, sample, and sampling techniques, instruments for data collection and development of teaching programme on Bio Medical Waste Management pilot study and plan for data analysis

Research Approach:

In the present study, the researcher aims to determine the effectiveness of planned Teaching programme changes on Bio Medical Waste management using evaluative approach.

Research Design:

Research design selected for the present study was one group pretest posttest design which is a Pre -Experimental design to measure the effectiveness of planned teaching program.

VARIABLES

Variables are the qualities, properties or characteristic of persons, things or situation that change or vary.

Two types of variables are used in this study. They are

1. Independent variable.
2. Dependent variable.

Dependent variable: It is the outcome variable of interest that is hypothesized to depend on or be caused by another variable, the independent variable.

Independent variable: In the present study, independent variable was planned teaching programme titled "Bio Medical Waste Management". The dependent variable was knowledge as measured by structured knowledge questionnaires

SETTING OF THE STUDY

The study was conducted in a Era hospital, which is reputed and well equipped with modern treatment facility. The researcher selected this setting for the following reasons.

- Availability of the samples.
- Familiarity with the setting.
- Economic feasibility for conducting the study.

POPULATION, SAMPLE AND SAMPLING TECHNIQUES

Population

In this study the population were the staff nurses working in selected hospital at Lucknow. The total population in the study included 60 staff nurses.

Sample

The sample for the present study comprised of sixty staff nurses.

Sampling Technique:For the present study non probability purposive sampling technique was selected and considered appropriate

Sampling criteria

Inclusion criteria

The inclusion criteria for the sampling were

- Registered staff nurses with Diploma and degree in Nursing.
- Staff nurses who are willing to participate in the study.
- Staff nurses present during the study.

Exclusion Criteria

The exclusion criteria for the sampling were:

- Staff nurses who are not willing to participate in the study.

Data Collection Technique

The major task of the researcher is to develop an instrument that accurately and precisely measures the variables of interest. Data collection tools are the procedures or instrument used by the researcher to observe or measure the key variable in the research problem. Since the purpose of the study was to assess the level of knowledge before and after the administration of PTP, self-administered knowledge questionnaires were found to be appropriate.

Development of Instrument

Nursing studies require the availability of an extensive array of measurement tools. Common measurement approaches used in nursing research includes physiologic measures, observation interviews, questionnaires and scales.

In the study the researcher used structured knowledge questionnaire, which was a printed self report form consisting of definite, concrete and predetermined questions to elicit information changes on Bio Medical waste management.

The tool was developed in order to attain the objectives of the study. The researcher adopted following steps in the development of the instruments

- Review of literature provided adequate content for the tool preparation.
- Personal experience and discussion with experts.
- Prior to structuring the knowledge questionnaire, the investigator visited various hospitals and collected the relevant data to construct the items for knowledge questionnaire.
- Development of a blueprint of knowledge questionnaire
- Construction of demographic proforma and structured knowledge questionnaire on Biomedical waste management
- Content validity
- Pre-testing the instruments
- Reliability.

ETHICAL CONSIDERATION

- Permission for the study was obtained from the Medical Superintendent and Nursing Superintendent of a Era hospital in lucknow .
- The study proposal was presented to the ethical committee of a Era university in luck now for ethical consideration .
- An informed consent was also obtained from the respondents after proper explanation about the purpose, usefulness and implications of the study and assurance given about the confidentiality of their responses

DATA ANALYSIS AND INTERPRETATION

The collected data were analyzed and interpreted under the following headings:-

SECTION I: Socio Demographic data of staff nurses .

SECTION 2: Comparison of pre and post test score to assess the knowledge regarding changes on bio- medical waste management among staff nurses .

SECTION 3: Effectiveness of structure teaching programme to improve the knowledge regarding bio- medical waste management staff nurses

SECTION 4: Association of level of pretest knowledge with their selected demographic variables.

SECTION – I : DISRIPTION OF DEMOGRAPHIC

S No.	Demographic Data	Category	Frequency	Percentage
1	Sex	Male	2	3.3333%
		Female	58	96%
2	Educational Program	Yes	42	70%
		No	18	30%
3	Educational	GNM	34	56.66%
		Post .Bsc	18	30%
		Bsc. Nursing	8	13.33%
4	Area	Medical	1	30%
		Surgical ward	2	26.66%
		Emergency ward	3	21.66%
		General ward	4	21.66%

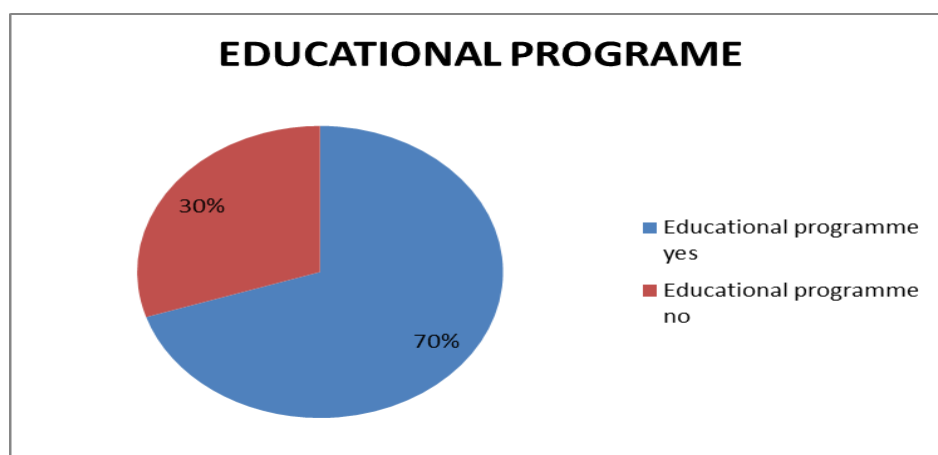


Fig 3. Pie diagram depicting percentage distribution of staff nurses according to the previous exposure of educational programme

3	Education		
	GNM	34	56.66%
	Post -B.sc nursing	18	30%
	B.sc nursing	8	13.33%

Section - 2: Table 4 Paired “t”-test values to assess the effectiveness of video assisted teaching on knowledge regarding bio-medical waste management among staff nurses . n = 60

Aspects	Pre Test		Post Test		Mean Difference	‘T’ Value	Inference
	Mean	Sd	Mean	Sd			
Introduction	1.75	0.46	1.85	0.40	0.1	2.56	S
Questionrelated Hazard, Source ,Colour Code Od Bmwm	5.93	1.07	6.6	1.2	0.67	5.43	S
Steps Of Bio-Medical Waste Management	5.76	1.58	8.533	1.756	2.74	11.91	sS
Labling	1.51	0.71	2.15	0.70297	1	6.28	S
Treatment Of Bio -Medical Waste Management	3.13	1.05	4.5	1.217922	1.37	9.457	S

Note: S- Significant, at P<0.05 level. Df =59 The above Table 5. revealed that The paired ‘t’ value shows that there is significant difference between pre test and post test knowledge score (t-15.02) at 0.001 level of significance. It indicate the effectiveness of videoassisted teaching programme in improving the knowledge regarding changes on bio medical waste management among staff nurses

Table 4.1: Overall Mean percentage Knowledge Scores of Pre-test and Post-tests knowledge scores of pre-test. n= 60

Aspects	Range Score	Mean Score	Knowledge Mean %	Score SD	Paired ‘t’ Test
Pre Test	14-25	18.10	60.33	2.55	
Post Test	19-27	23.63	78.76	2.85	15.012
Enhancement		5.54	18.33	2.86	

* Significant at 5% Level (< p 0.05)

Table 6 indicates the overall mean percentage knowledge of pre-test and post-test on changes on bio medical waste management . The post-test mean percentage knowledge score was found higher (mean percentage 78.76% and SD 2.85 when compared with pre-test mean percentage knowledge score value which was 60.33% percentage with SD of 3.32 (mean knowledge enhancement score was 5.54 ,18 .33%and SD 2.86. The statistical paired ‘t’ test implies that the difference in the pre-test and posttest value was found statistically significant at 5% level (p<0.05) with a paired ‘t’ test value of15.012. There exists a statistical significance in the enhancement of level of knowledge score indicating the positive impact of video Structure teaching. Hence the stated research hypothesis **H₁ is accepted.**

DISCUSSION

In view of this a, study looking into the effectiveness of structure teaching programme on changes in biomedical waste management among staff nurses was conducted which led to the following findings which have been discussed with reference to the objectives and hypothesis stated in the initial chapters.

The major findings of the study were as follows:

DEMOGRAPHIC CHARACTERISTICS:

- Majority of the staff nurses (96%)were females and (3.33%) male
- Majority of the staff nurses (95%) were within the age group of 20- 30 yrs.
- 70% of the staff nurses had attended any educational program workshop or training on biomedical waste management.
- Majority of the staff nurses (56%) were GNM, then (30%) were post B.sc and 13.33% were B.sc nursing .
- 30% of nurses from medical ward , 26.66% surgical ward and 21.66% both emergency and general ward .

Pretest knowledge level of staff nurses

- The data showed that maximum (80%) no of staff nurses scored between the range of 16-23.
- The mean score was (18.7), whereas the maximum possible score was 30.
- Among the five areas of biomedical waste management the mean percentage score of the subjects was highest (87.5 %) in the area of introduction of bio medical waste management and the lowest (44.71%) in the area of treatment of bio medical waste management .

Effectiveness of planned teaching program:

Highest posttest mean percentage score (95%) was in the area of introduction related bio –medical waste management .

- Maximum modified gain was in the area of steps of bio medical waste management (8.533%) and minimum gain was in bio medical waste introduction .
- The mean posttest knowledge scores (23.63) were higher than the pretest scores (18.09%).

The t value showed the significant difference in the posttest, $t = 15,02$, $p < 0.05$, which indicates that the planned teaching program was effective in increasing the knowledge of staff nurses regarding biomedical waste management.

SUMMARY

The study findings showed that there was a significant increase in the knowledge of staff nurses after administration of planned teaching program on Biomedical waste management hence it was concluded that planned teaching programme was effective in increasing the knowledge of staff nurses.

The study findings revealed that majority of the staff nurses (97%) were females. Majority of the staff nurses (95%) were within the age group of 20- 30 yrs .None of the staff nurses had attended any previous educational programme or training on Biomedical waste management

The mean pre test knowledge score was 18.7.Among the six areas of biomedical waste management

the highest (87.5 %) mean percentage knowledge score was in the area of waste transportation and the lowest (30 %) was in the area of waste segregation and collection, and waste treatment and disposal. Highest post-test mean percentage score (95%) was in the area of waste transportation. Maximum modified gain was in the area of waste handling & collection (2.27) and minimum gain was in waste transportation (1.3).

The mean post-test knowledge scores (18.01) were higher than the pretest scores (23,63). The t value showed the significant difference in the posttest, ($t = 15.02, p < 0.05$),

CONCLUSION

Following conclusions were drawn on the basis of the findings of the study:

The study findings showed that the knowledge of the nurses regarding changes in biomedical waste management was found to be adequate except in the area of waste introduction which was good (87%). On the contrary a deficit in knowledge (44.71 %) was found with regard to treatment of bio medical waste management . It suggests that there was a need for the staff nurses to update their knowledge through training and education on biomedical waste management

Nursing Recommendation

To comply with biomedical waste (management and handling) rules and to safeguard their own health, nursing staff must have knowledge and skill related to safe handling, collection, storage treatment and disposal of biomedical waste. In the present study planned teaching program was found to be effective in improving the knowledge of staff nurses. The findings of the present study have implications in various areas of nursing i.e., nursing service, nursing education, nursing administration, and nursing research.

Nursing service

Nursing is a service-oriented profession and it must enhance to the extent that it keeps with the advancing technology, with changing trends and issues. The findings of the study could be utilized as a basis for in-service education of the nurses so that constant awareness and clear understanding may be created regarding biomedical waste management. It also serves as a guideline for the nurse administrators to plan continuing education program, additional instructions, or training to the staff nurses

Nursing education

“Quality care through excellence in advanced nursing education” is just apt to meet the increasing demand of good quality of nursing In the changing scenario of health care delivery system, since the emphasis is shifted from care oriented to health promotion oriented approach, nurses need to gain more knowledge on various aspects of health. Inadequate knowledge regarding biomedical waste management is of concern to nurse educators. The findings of this study can be used as an informative illustration to the student nurses. Nursing student should be made aware of their role in health promotion and disease prevention in the present and future era. The nursing curriculum should consist of knowledge related to health information using different methods of teaching. Active participation of students can be encouraged by providing opportunity for clinical teaching on biomedical waste management. Novice nurses must be given training related to biomedical waste management practices and periodical assessment should be done.

Nursing administration:

Like people in other profession, nurses operate in an “Age of accountability” where quality and cost issues drive the direction of health care.

Nursing administration must plan a separate budget for continuing education program related to biomedical waste management for nursing personnel and motivate them to impart the information and create the awareness among other health care workers. Periodic evaluation should be done to ensure safe practice of managing and handling wastes by the staff nurses and other health care employees in order to prevent health risks related to bio-hazardous wastes.

Nursing research:

The nursing profession is increasingly in the development of scientific knowledge relating to its practice. Research becoming a major force in nursing and is being used to change practice, education and policy. The budding investigators should conduct similar studies on a large scale. In depth study on biomedical waste management should be pursued. Extensive approaches should be implemented in this area to identify several more effective method of education, this study be a baseline for further studies to build upon.

LIMITATIONS

The limitations of the present study were:

- The study was confined to larger number of subjects working in a Era hospital, which limits the generalization of findings.
- Knowledge of the staff nurses was assessed only through the structured knowledge questionnaire.

Teaching was not planned on the basis of the needs of the subject under study, but on the reports of previous studies

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