



Medical Surgical Nursing

A STUDY TO ASSESS THE KNOWLEDGE REGARDING BIOMEDICAL WASTE MANAGEMENT AMONG STAFF NURSES WORKING IN SELECTED HOSPITAL, MEERUT.

**Mrs. Meera Raj
M.A**

Phd Scholar, Shri Venkateshwara University, Gjraula.

**Dr. Harimohan
Singh**

Phd, Shri Venkateshwara University, Gjraula.

ABSTRACT

Lack of adequate knowledge regarding bio-medical waste management leads to health risks as well as environment apprehension. Improper management of biomedical waste (BMW) poses a risk for health and environment. Healthcare workers, mainly nurses have an important responsibility to properly segregate and train the staff in its disposal. The present study aimed to assess the knowledge regarding biomedical waste management among staff nurses working in selected hospital, Meerut. Descriptive design was used for the study. Non probability purposive sampling technique was used. Sample size was 50. Closed ended questionnaire was used to collect the data. Data was analyzed by inferential and descriptive statistics. Result of the study was to assess the knowledge of nurses based on the demographic variables, majority of nurse belongs to the age group of 20-25 years (30%) and lowest percentage of nurses belongs to the age group of 26-30 years (12%). Most of the nurses were males 28(63%) and remains nurses were females 22(37%). Majority of the nurses have the qualification of GNM 18(36%), other nurses have the qualification of B.sc nursing 15(30%) and Post Basic Bsc.Nursing 14(28%). Other nurses are belongs in the group of M.Sc nursing 6(20%). Most of the nurses are female 28 (56%) and others are male 22(44%). Most of the nurses working in medical & surgical ward 18(36%) and least nurses working in OPDs 7(14%). Large number of nurses have got the previous knowledge from previous experience 41(82%) and others have got information through BMW manual 7(14%), Seminars 1(2%) and continue nursing education 1(2%). Nurses got information from hospital clinical experience 16(32%) and others got from books 12(24%), others got information through in mass media 11(22%) and remains got information from in service education 9(18%) respectively. Study concluded that, staff nurses have average knowledge regarding biomedical waste management.

KEYWORDS :

INTRODUCTION

Health care is the maintenance or improvement of health via the prevention, diagnosis and treatment of disease, illness, injury and other physical and mental impairment in human being. Health care is delivered by health professional in allied health fields. Health facility is, in general, any location where health care is provided. Health facilities range from small clinics and doctor's offices to urgent care centers and large hospitals with elaboration emergency rooms and trauma centers¹. The biomedical waste produced during the course of healthcare activities are higher potential for hospital acquired infection, which can increase the morbidity and mortality rate as well as the cost of treatment and injury than any other type of waste. Inadequate and improper knowledge on handling of healthcare waste may have serious health hazards and consequences and an unhealthy impact on the environment as well². According to WHO, of the total amount of waste generated by health-care activities, about 85% is general, non-hazardous and the remaining 15% is treated as infectious or radioactive³.

Biomedical waste is generated from biological and medical sources and activities, such as the diagnosis, prevention, or treatment of diseases. Common generators (or producers) of biomedical waste include hospitals, health clinics, nursing homes, emergency medical services, medical research laboratories, offices of physicians, dentists, veterinarians, home health care and morgues or funeral homes. In healthcare facilities (i.e. hospitals, clinics, doctor's offices, veterinary hospitals and clinical laboratories), waste with these characteristics may alternatively be called medical or clinical waste⁴. Hospital waste management "is of vital importance as its unprofessional handling and transportation cause high risks to health care workers, waste handlers, patients, community in general and largely the environment. It may also include waste associated with the generation of biomedical waste that visually appears to be of medical or laboratory origin (e.g. packaging, unused bandages, infusion kits etc.), as well research laboratory waste containing biomolecular or organisms that are mainly restricted from environmental release³. Discarded sharps are considered biomedical waste whether they are contaminated or not, due to the possibility of being contaminated with blood and their propensity to cause injury when not properly contained and disposed. Biomedical waste is a type of biowaste. Biomedical waste may be solid or liquid. Examples of infectious waste include discarded blood, sharps, unwanted microbiological cultures and stocks, identifiable body parts (including those as a result of amputation), other human or animal tissue, used bandages and

dressings, discarded gloves, other medical supplies that may have been in contact with blood and body fluids, and laboratory waste that exhibits the characteristics described above. Waste sharps include potentially contaminated used (and unused discarded) needles, scalpels, lancets and other devices capable of penetrating skin.⁷ Handling, segregation, mutilation, disinfection, storage, transportation and final disposal are vital steps for safe and scientific management of bio-medical waste in any establishment. There are various categories of Biomedical Wastes. They must carefully segregate, disinfected and disposed off. The key to minimization and effective management of biomedical waste is segregation (separation) and identification of the waste.⁵ The International Council of Nurses (ICN) believes all nurses have a duty to reduce/eliminate the negative impact of medical waste on the environment. ICN and national nurses associations (NNAs), as representative organizations of nurses and nursing, have the responsibility to direct clinical and policy decisions with regard to medical waste⁶.

Statement of the problem

A descriptive study to assess the knowledge regarding biomedical waste management among staff nurses working in selected hospitals in Meerut, Uttar Pradesh.

Objectives of the study

- To assess the knowledge regarding biomedical waste management among staff nurses working in selected hospital, Meerut.
- To find out the association between the knowledge score with their selected demographic variables.

Operational definition

Assess :-

Estimate the value, importance of quality of someone or something. In this study assess means evaluating the knowledge regarding biomedical waste management among nurses.

Knowledge:-

Information that acquired in variety of way is expected to be an accurate reflection of reality and is incorporated and used to direct a person's action. In this study, knowledge means to correct response to the items of questionnaire on biomedical waste management which is measured by self-structured questionnaire.

Biomedical Waste Management:-

Refers to the waste generated as a result of diagnosis, treatment or immunization of human beings.

Hypothesis

H1:- There is a significant association between knowledge with their selected demographic variable at 0.05 level of significance.

Assumptions

- Nurses may possess knowledge regarding management of biomedical waste.
- Nurses can able to understand the questionnaire regarding the management of biomedical waste.

Delimitation

- The study delimited to staff nurses working in selected hospital Meerut.

Methodology

Quantitative research approach was used for this study.

Research design

Descriptive research design was used for this study.

Variables Under study

Research variable: -

Knowledge regarding the management of biomedical waste.

Demographic variables: -

Baseline characteristics such as age, education, , socio economic status, type of family, sources of information regarding biomedical waste management.

Setting of the study

The study will conduct the selected hospital at Meerut.

Population

In this study the population comprises of staff nurses working in Selected Hospitals, Meerut.

Sample

In the present study the sample consisted of 50 staff nurses who fulfils the inclusion criteria.

Sampling technique

Non –Probability convenient sampling technique was used for the present study.

Sampling criteria

Inclusion Criteria

- Staff nurses who are willing to participate in the study.
- Staff nurses who are present on the day of research.

Exclusion Criteria

- Staff nurses who are leave during the collection of data.
- Staff nurses who are unwilling to participate in the research.

Instruments used for the study

Data collection tool or instruments are the vehicle that could best obtain the data pertinent to the study and at the same time adds to the body of knowledge in the discipline. In order to gather data on knowledge of staff nurses, it was decided to develop a knowledge questionnaire. Hence it was decided to have a structured knowledge questionnaire to collect data regarding the knowledge management of biomedical waste management among staff nurses,

Development of instruments

Instruments were developed based on the following.

- Literature review.
- Discussion with experts.
- Personal experience and discussion with colleagues.

Description of instruments

The following instruments were used based on objectives

- Demographic data of staff nurses.
- Structured knowledge questionnaire on biomedical waste management among staff nurses.

1. Demographic data of staff nurses.

Demographic data consisted of items seeking information about background data of staff nurses such as age, gender, education, previous knowledge, source of working, types of hospital.

2. Structured knowledge questionnaire regarding biomedical waste management.

It contained 30 structured items on biomedical waste management

Scoring key and interpretation of the instruments

The structured knowledge questionnaire regarding biomedical waste management. The options included both correct and incorrect responses that is one correct response and three incorrect responses. The score for the correct response was '1' and score for the incorrect response was '0'. The level of knowledge on first aid for selected home accidents was interpreted as follows.

Table No. 2 grading of knowledge score

Sl. No.	Knowledge Score Range	Category
1.	0- 6	Poor
2.	7- 13	Average
3.	14- 20	Good

Data collection procedure

Data collection procedure Data was collected from 1-06-2022 to 30-06- 2022 Prior to the data collection, permission was obtained from nursingsuperintendent, Pyarilal government hospital and Jswant Rai Hospital Meerut to conduct the study. 50 staff nurses were selected by using convenient sampling technique. Informed consent was obtained from the sample by explaining the purpose of the study and assured them about Confidentiality and anonymity of the subject. The data were collected by administering closed ended questionnaire regarding BMW. Data was collected from three shift nursing personnel on the same day. 30 minutes were provided for answering to the questionnaire.

Plan for data analysis

Plan for data analysis the data was analyzed on the basis of objectives of the study. After coding the collected data, it was transferred to the master sheet. Then the data was analyzed by using descriptive and inferential statistics.

Descriptive statistics

Frequency percentage, mean and standard deviation were used for analysis.

Inferential statistics

Chi square was used to determine for association between demographic variables with the knowledge regarding biomedical waste management.

RESULTS

Result or analysis is a process of organizing and synthesizing data in such a way that research question can be answered and hypothesis tested. This chapter deals with the analysis and interpretation of data gathered to evaluate assess the knowledge regarding biomedical waste management among staff nurses in Pyari Lal Hospital and Dufferin Hospital. Analysis is the process of categorizing; organizing, manipulating and summarizing the data into obtain answers to the research questions.

The purpose of analysis is to reduce data into intelligible and interpretable form so that research problem can be studied. The data collected from 50 staff nurses was summarized, compared and tested based on objectives, to begin with the data was entered in a master sheet for tabulation and statically processing. First descriptive statistics were computed that are frequency percentage, mean and standard deviation. Next inferential statistics were computed, Chi-Square test were undertaken as described to below to meet objectives of the day.

Table: -Description of statistical method used in the study

Objectives	Statistical analysis
1, To determine the knowledge regarding the biomedical waste management among staff nurses.	Frequency, Percentage, mean, Standard Deviation
2.To find out the association between the knowledge and with their selected demographic variables	Chi-square test

The result of the data analysis is organized and presented under the following broad headings.

Section I: - Description of demographic characteristics of staff nurses.

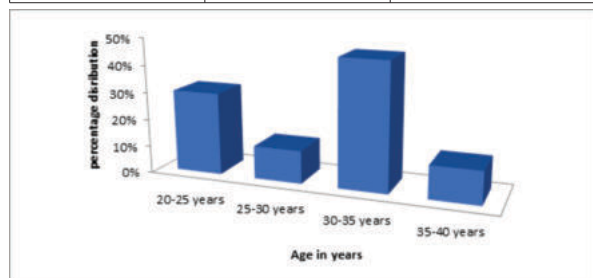
Section II: - Assessment of knowledge of the staff nurses regarding management of biomedical waste .

SectionIII: - Find out the association between the knowledge of staff nurses with their selected demographic variables and hypothesis testing.

Section: - I

Table No:- Percentage and frequency distribution of staff nurses as per their age group. N=50

Age in years	Frequency	Percentage
20-25	15	30%
26-30	06	12%
31-35	23	46%
36-40	06	12%
Total	50	100%



Bar diagram depicts that, frequency distribution of nurses as per the age group reveals, most of the nurses belongs the age group of 20-25 years i.e. 15(30%). The nurses 6 (12%) belong the age group of 26-30 years and 36-40 years. The nurses 23(46%) in the age group of 30-35 years.

Section II

Assessment of knowledge of nurses regarding the biomedical waste management

Mean, Standard deviation and Mean percentage based on the knowledge of nurses regarding the COVID19 management. N=50

Domain	Scores		
	Mean	SD	Mean%
Knowledge of the nurses	20.5	3.9	68.3%

Above mentioned table shows that mean score of nurses based on the knowledge is 20.5, stand deviation is and mean percentage score is 3.8 and mean% is 68.3%. It reveals that nurses have average knowledge regarding the biomedical waste management.

Section III

Hypothesis testing

To assess the knowledge of staff nurses regarding the management of biomedical waste management, hypothesis was tested by chi -square test. chi -square test was calculated to analysis the association of demographic variables with their knowledge score regarding the biomedical waste management.

H1:- There is a significant association between knowledge score of subjects with their selected demographic variables at 0.05 level of significance.

N =50

NS – not significant, * - Significant

Above the table shows that there is a significant association between overall knowledge scores of nurses regarding the biomedical waste management with their selected demographic variables of subjects such as, area of working and sources of information.

When chi –square value was computed for the demographic variable such as professional experience, qualification and source of

information, the obtained value was higher than the table value at 0.05 level.

Demographic Variables	Category	Respondent's Knowledge				X2 Value
		Below mean(<15) Frequency	%	Above mean(15) Frequency	%	
Age	20-25	06	12	8	16	7.546NS df-3
	26-30	07	10	11	22	
	31-35	05	14	5	10	
	36-40	05	14	1	02	
Professional qualification	GNM	7	14	11	22	7.82NS df-3
	BSC	8	16	07	14	
	POST.BSC	7	14	07	14	
	MSC	3	06	00	00	
Gender	Male	12	24	16	32	Chi-Square is not computed
	Female	13	26	09	18	
Previous knowledge	Clinical experience	20	40	21	42	7.82NS df-3
	BMW Manual	03	06	04	08	
	Seminars	01	02	00	00	
	Continue nursing education	01	02	00	00	
Area of working	Emergency /causality	6	12	7	14	8.72* df-3
	Medical &Surgical ward	12	24	6	12	
	ICU	4	08	8	16	
	OPD	03	06	4	08	
Source information	Hospital clinical experience	10	10	6	16	20.52* df-3
	Books	05	20	7	12	
	In service education	01	02	8	16	
	Mass media	07	14	4	08	

DISCUSSION

A descriptive design was used to assess the knowledge of nurses regarding the biomedical waste management. Data were collected from January 1/06/22 to 30/06/22. Data had collected from 50 staff nurses by purposive sampling technique. Closed ended questionnaire analysed by using descriptive and inferential statistics presented in the form of tables and diagram.

This chapter attempts to discuss the findings of the study as per the objectives. The findings are discussed under the following headings.

- Description of demographic variables of subjects.
- Assessment of knowledge of nurses regarding the biomedical waste management.
- Testing hypothesis

Description demographic variables of subjects

The demographic variables considered in the present study included variables like age, gender, professional qualification, area of working and source of information. The investigator believed that these variables could have some impact on the dependent variable and thus these variables were included in the study,

When present study, assessed the knowledge of nurses based on the demographic variables, majority of nurse belongs to the age group of 20-25 years (30%) and lowest percentage of nurses belongs to the age group of 26-30 years 6 (12%). Most of the nurses were males 28(63%) and remains nurses were females 22(37%). Majority of the nurses have the qualification of GNM 18(36%), other nurses have the qualification of B.sc nursing 15(30%) and Post Basic B.Sc. Nursing 14(28%). Other nurses are belongs in the group of M.Sc nursing 6(20%). Most of the nurses are female 28 (56%) and others are male 22(44%). Most of the

nurses working in medical & surgical ward 18(36%) and least nurses working in OPDs 7(14%). Large number of nurses have got the previous knowledge from previous experience 41(82%) and others have got information through BMW manual 7(14%), Seminars 1(2%) and continue nursing education 1(2%). Nurses got information from hospital clinical experience 16(32%) and others got from books 12(24%), others got information through in mass media 11(22%) and remains got information from in service education 9(18%) respectively.

Assessment of knowledge of staff nurses regarding biomedical waste management

In this assessment, knowledge score of the staff nurses was 68.3%. The overall mean and standard deviation of staff nurses regarding the knowledge was 20.5 ± 3.9. It shows that nurses have average knowledge regarding biomedical waste management.

Hypothesis testing

There is a significant association between the levels of knowledge with education, previous work experience and sources of information of nurses at $p < 0.05$ level. There is no significant association with the age of the nurses.

Summary

A non-experimental descriptive study was conducted among 50 staff nurses in Selected hospital Meerut. Data were collected from 1-6-2021 to 30-6-2022 through closed ended questionnaire. Collected data were analysed by using descriptive and inferential statistics.

The findings are summarized as follows:

- Most of the nurses belonged in the age group of 25-30 years (30%).
- Almost all the nurses were males 28(56%).
- Majority of the nurses have the qualification of GNM 18(36%).
- Large number of nurses got the previous knowledge from previous experience 41(82%).
- Majority of the nurses have got the source of information from clinical experience 16(32%).
- Most of the nurses working in Medical & Surgical ward 18(36%).

CONCLUSION

From the findings of the present study it can be concluded that, the nurses have average knowledge regarding the biomedical waste management.

Recommendations

- A Quasi-experimental study can conduct the effectiveness of biomedical waste management training programs among nurses in selected hospitals.
- A study to assess the effectiveness of biomedical waste management training program among nursing students in selected nursing colleges.
- A study to assess the knowledge, attitude of nurses regarding management of biomedical waste management in selected hospitals.
- A same study we can conduct survey approach to identify the knowledge of large sample

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