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### A study to assess the knowledge regarding biomedical waste management among nursing officers in selected areas of PCMC Hospital, Pune

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#### Abstract

The biomedical waste has become a serious health hazard in many hospitals. The waste has been disposed off illegally in to the garbage and into the sewers in most of the parts of the world including India. In many places, the waste is disposed carelessly and indiscriminate disposal of this waste by healthcare. So many hospitals waste spread serious disease such as hospitals and AIDS (HIV) among those who handle it and also among the general public the waste disposal is at generator site and nurses are highly responsible for biomedical waste management they play a leading role in managing and supervising hospital waste.

Problem statement a study to assess the knowledge regarding biomedical waste management among Nursing officers in selected areas of PCMC Hospital, Pune.

Methodology a non probability purposive sampling technique was used for this study

Materials and methods Research Approach: In This Study Used evaluative approach

Research Design was used Non Experimental descriptive design: The setting for this study was the selected hospitals in PCMC, Pune. The population of the present study conducted in selected hospitals at PCMC, Pune. Sample for this study consists of Nursing officers working in selected areas of PCMC Hospital, Pune. The General Systems Theory was used for the study which is developed by Ludwig Von Bertalanffy. The setting for this study was the selected hospitals in PCMC, Pune.

Results The study concluded that Half (50%) of the Nursing officers had average knowledge (Score 7-13), 26.7% of them had poor knowledge (Score 0-6) and 23.3% of them had good knowledge (score 14-20) regarding biomedical waste management. 60.0% of the Nursing officers knew the personal protective measures. 53.3% of them were aware of the colour of the container in which are needles and blades disposed. 46.7% of them knew Plastic syringe will be discarded in what colour bin. 46.7% of them knew Cotton dressing soiled with blood goes in which colour code. 50% of them knew General and domestic waste is put in what colour bag. 60% of them knew the waste disposal methods. 43.3% of them knew what the disease caused during hospitalization are called. 30% of them knew Hospital infection control concerns personnel. The investigator concluded that in the wake of increased demand on quality care and accreditation also in the best concern of the clients there is a need to improve the knowledge level of Nursing officers regarding biomedical waste management. Staff training activity like continuing nursing education, workshops and seminars on the concerned topic should be undertaken. Also periodic assessment through competency matrix and evaluation is required.

**Keywords:** bio-medical waste, nursing officers, knowledge

#### Introduction

All human activities and living thing on earth produce waste in some form or the other. Normally, aerobic and anaerobic process in the environment degrades such products. These waste, both biodegradable and non-biodegradable hardly had any impact on the environment until the invention of plastics by the modern man. The process of natural degradation could not keep pace with the increase in waste generated by the over increasing population of mankind and its necessities. The air, water, and land are today becoming disposal sinks for the waste.

Waste is a useful to first user but with its transportation after use, some of the waste items are useful to subsequent users. If subsequent utilization is harmful, waste should be removed with such precautionary measure keeping it out of

reach for others but, the trouble comes throw away society.

The hospital medical waste is responsible for serious health hazards. Though the persons involved in this aspect the existing status of biomedical waste management cannot be said satisfactory due to many shortcomings and constrains. No specific guidelines and parameters are being followed or implemented by the staff concerned. They are poorly educated guidance and supervision is poor.

Some hospital waste generated are too hazardous to be treated negligently and if any carelessness is followed by the management of these wastes it is a hospital that tends to spread infection and contamination of the entire living environment prevailing in the hospital. The delay in the recovery and overburden for weak patients. It affect the most of the patient's survival and also generate health

hazards to working personnel in & around the hospital environment.

Now today nursing is considered as a professional discipline that includes the art of applying scientific knowledge to practice.

### Background of the study

The hospital generated waste is concerned by the growing problem of the disposal of waste. Though generate large amount of medical wastes each year. Surprisingly until recent days not enough very much of attention. Was paid to the disposal of hospital waste. Proper disposal of health care waste is of paramount importance because of its infections and hazardous characteristics. Some of the specific problems of improper waste management.

- Organic portion, of health care waste ferments and attracts fly breeding, which may increase the risk of infection of waste handlers, and (eventually) the general public.
- Poor management can increase risk of infections to medical, nursing and other hospital staff.
- Injuries from sharps can results to all categories of hospital personnel and waste handlers.
- Poor waste management and poor infection control can lead to noscomial infections in patients.
- Increase in risks associated with hazardous chemicals & drugs being handled by persons handling waste at all levels.
- Poor hospital waste management encourages disposable being repacked and sold without proper disinfection.
- Poor management practices can lead to disposed drugs being repacked and sold

The Government of India has promulgated the Bio-chemical waste management & handlings rules, 1998. These are a welcome step towards improving the overall waste management of health care units in India. These waste management of health care units in India. These rules are applicable to all persons who generate, receive, store, transport, treat, dispose or handle bio-medical waste. These rules are also applicable to any institution generating bio-medical waste including hospitals, nursing homes, clinics, dispensaries veterinary institution, animal houses, pathological laboratories and blood bank, or authorities in charge of these institutions.

**Methodology:** A Non Probability Purposive Sampling Technique was used for this study

**Research approach:** The present study aims at assessing the knowledge of nurses regarding biomedical waste management hence the investigator has adopted the evaluative approach.

**Research design:** In the this study the investigator selected the Non Experimental descriptive design.

### Variables under study

**Dependent variable:** In this study dependent variable is biomedical waste management.

**Independent variable:** In this study independent variable is

Nursing officers.

**Research Setting:** The setting for this study was the selected hospitals in PCMC, Pune.

**Population:** The population of the present study conducted in selected hospitals at PCMC, Pune.

**Sample:** Sample for this study consists of Nursing officers working in selected areas of PCMC Hospital, Pune.

### Sample Selection criteria (Inclusion and Exclusion)

#### Inclusion criteria

Nursing officers who are working in PCMC Hospital, Pune.  
Nurses who are willing to participate in the study

**Exclusion criteria:** Nurses with higher qualification than B. Sc nursing  
Nurses who are not willing to participate in the study

**Sample Size:** 30

**Sampling technique:** in this study Purposive Sampling Technique

**Development of tool:** Opinions and suggestions were taken from the experts, which helped in determining the important areas to be included.

**Description of the tool -It includes three sections:**

**Section I:** This section involves items searching the information on demographic profile of a sample such as age, gender, designations, education, and clinical experience of the hospital.

**Section II:** This section includes the structured questionnaire regarding biomedical waste management. It consists of 20 multiple choice type questions. Knowledge levels were scored as;

Poor: 0-5

Good: 6-10

Average: 11-15

Excellent: 16-20

### Validity

The data collection tool was sent to experts along with a scoring sheet for content validity. Tool was sent to 20 experts out of whom, 15 were received back with their valuable suggestions and guidance for the perfection. The validity of the tool was established by experts from the different departments i.e. Paediatric Medicine, Paediatric nursing, stastician. They are suggested need to scoring is important for feeding observation tool. The valuable suggestions from the experts were used to receive a positive direction for the study. Certain items were modified as per their suggestions.

### Ethical consideration

- Researcher had obtained approval from appropriate review boards to conduct the study.
- Researcher had taken formal permission from the parents of newborn to conduct study.
- Only the samples who had signed the consent form are

included in the study.

- Confidentiality of the data is maintained strictly

**Reliability**

The reliability of an instrument that yields Quantitative Data is a major concern for assessing its quality and adequacy. Essentially the reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to be measuring. The reliability of a measuring tool can be assessed in several different ways. Reliability was assessed using test re-test method for knowledge section and inter-rated method of reliability for practice section.

The test re-test reliability was used for Structured Questionnaire. The researcher administered the same Structured Questionnaire test to 10 Nursing officers working in PCMC Hospital on two occasions with an interval of 30 minutes and then compared the scores obtained. The comparison procedure was performed objectively by computing a reliability coefficient, which is numerical index of the magnitude of the test’s reliability. For knowledge section, reliability was assessed using test-retest method. Pearson’s correlation coefficient was found to be 0.98.

**Plan for data collection**

- Ethical committee clearance
- Permission from the authorities of the Hospitals.
- Consent from parents of newborn

**Data analysis and interpretation**

- Items related to the background variables were analyzed in terms of frequency and percentages.
- Scores was graded in 3 categories i.e. Poor, Average and Good
- Frequency distribution were plotted to represent the final score.
- Mean, standard deviation of the test was computed.
- The findings were documented in tables, graphs and diagrams.

**Pilot study**

After doing pilot study investigator found that it is feasible to carry out actual study. In these study data was done among selected samples of nursing officers.

**Result**

The analysis is defined as the categorizing, ordering, manipulating and summarizing of data to obtain answers to research questions. The purpose of analysis is to reduce the data to intelligible and interpretable form so that the relation of research problems can be studied and tested.

This chapter presents the analysis and interpretation of the data collected to assess the knowledge regarding biomedical waste management among staff nurses. The data was analyzed according to objectives of study, which were:

- To assess the knowledge level regarding biomedical waste management among Nursing officers in selected areas of PCMC Hospital, Pune.
- To determine the association between level of knowledge regarding biomedical waste management and the selected demographic variables.

**Organization of the data**

The collected data was tabulated, analyzed, organized and presented under the following headings:

**Section I:** Description of samples (Nursing officers) based on personal characteristics.

**Section II:** Analysis of data related to the knowledge level regarding biomedical waste management among Nursing officers.

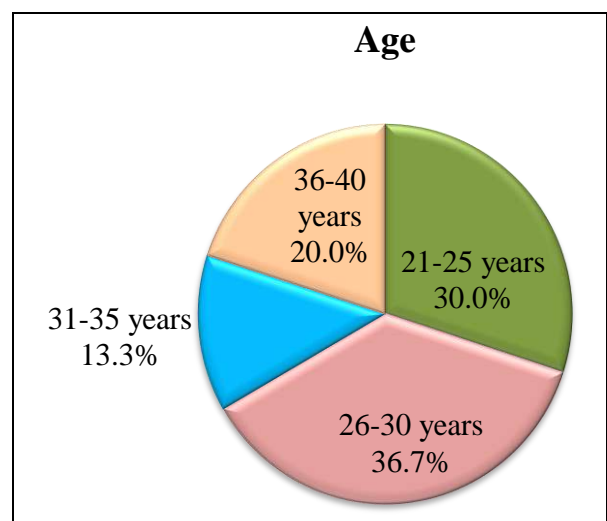
**Section III:** Analysis of data related to association between level of knowledge regarding biomedical waste management and the selected demographic variables.

**Section I**

**Description of samples (Nursing officers) based on personal characteristics**

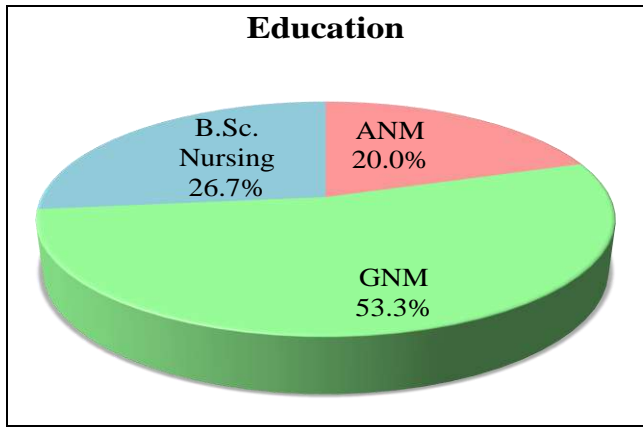
**Table 1:** Description of samples (Staff nurses) based on personal characteristics in terms of frequency and percentages N=30

Demographic variable	Freq	%
<b>Age</b>		
21-25 years	9	30.0%
26-30 years	11	36.7%
31-35 years	4	13.3%
36-40 years	6	20.0%
<b>Gender</b>		
Male	5	16.7%
Female	25	83.3%
<b>Education</b>		
ANM	6	20.0%
GNM	16	53.3%
B.Sc. Nursing	8	26.7%
<b>Years of experience</b>		
0-2 years	11	36.7%
3-5 years	14	46.7%
6-9 years	3	10.0%
More than 9 years	2	6.7%



**Fig 1:** Description of sample according to age by percentage

30% of the Nursing officers had age 21-25 years, 36.7% of them had age 26-30 years, 13.3% of them had age 31-35 years and 20% of them had age 36-4 years.



**Fig 3:** Description of sample according to qualification by percentage

20% of them were ANM, 53.3% of them were GNM and 26.7% of them had B.Sc. Nursing.

**Section II**

**Analysis of data related to the knowledge level regarding**

**biomedical waste management among staff nurses**

**Table 2:** Knowledge level regarding biomedical waste management among staff nurses N=30

Knowledge	Freq	%
Poor (Score 0-6)	8	26.7%
Average (Score 7-13)	15	50.0%
Good (Score 14-20)	7	23.3%

Half (50%) of the Nursing officers had average knowledge (Score 7-13), 26.7% of them had poor knowledge (Score 0-6) and 23.3% of them had good knowledge (score 14-20) regarding biomedical waste management.

**Section III**

**Analysis of data related to association between level of knowledge regarding biomedical waste management and the selected demographic variables.**

Association between level of knowledge regarding biomedical waste management and the selected demographic variables was assessed using Fisher’s exact test. The summary of Fisher’s exact test is tabulated below:

**Table 4:** Association between level of knowledge regarding biomedical waste management and the selected demographic variables N=30

Demographic variable		Poor	Average	Good	p-value
Age	21-25 years	5	4	0	0.001
	26-30 years	3	8	0	
	31-35 years	0	1	3	
	36-40 years	0	2	4	
Gender	Male	0	4	1	0.387
	Female	8	11	6	
Education	ANM	4	2	0	0.071
	GNM	4	7	5	
	B.Sc. Nursing	0	6	2	
Years of experience	0-2 years	7	4	0	0.001
	3-5 years	1	10	3	
	6-9 years	0	1	2	
	More than 9 years	0	0	2	

Since p-values corresponding to age and years of experience are small (less than 0.05), age and years of experience of Nursing officers were found to have significant association with knowledge regarding biomedical waste management.

**Conclusion**

The study concluded that Half (50%) of the Nursing officers had average knowledge (Score 7-13), 26.7% of them had poor knowledge (Score 0-6) and 23.3% of them had good knowledge (Score 14-20) regarding biomedical waste management. 60.0% of the Nursing officers knew the personal protective measures. 53.3% of them were aware of the colour of the container in which are needles and blades disposed. 46.7% of them knew Plastic syringe will be discarded in what colour bin. 46.7% of them knew Cotton dressing soiled with blood goes in which colour code. 50% of them knew General and domestic waste is put in what colour bag. 60% of them knew the waste disposal methods. 43.3% of them knew what the disease caused during hospitalization are called. 30% of them knew Hospital infection control concerns personnel. The investigator concluded that in the wake of increased demand on quality

care and accreditation also in the best concern of the clients there is a need to improve the knowledge level of Nursing officers regarding biomedical waste management. Staff training activity like continuing nursing education, workshops and seminars on the concerned topic should be undertaken. Also periodic assessment through competency matrix and evaluation is required.

**Discussion**

The findings of the study have been discussed with reference to the objectives stated in chapter 1 and with findings of other studies.

- 30% of the Nursing officers had age 21-25 years, 36.7% of them had age 26-30 years, 13.3% of them had age 31-35 years and 20% of them had age 36-4 years.
- 83.3% of them were females and 16.7% of them were males.
- 20% of them were ANM, 53.3% of them were GNM and 26.7% of them had B.Sc. Nursing.
- 36.7% of them had 0-2 years of experience, 46.7% of them had 3-5 years of experience, 10% of them had 6-9 years of experience and 6.7% of them had more than 9

years of experience.

Half (50%) of the Nursing officers had average knowledge (Score 7-13), 26.7% of them had poor knowledge (Score 0-6) and 23.3% of them had good knowledge (score 14-20) regarding biomedical waste management.

60.0% of the Nursing officers knew the personal protective measures. 53.3% of them were aware of the colour of the container in which are needles and blades disposed. 46.7% of them knew Plastic syringe will be discarded in what colour bin. 46.7% of them knew Cotton dressing soiled with blood goes in which colour code. 50% of them knew General and domestic waste is put in what colour bag. 60% of them knew the waste disposal methods. 43.3% of them knew what the disease caused during hospitalization are called. 30% of them knew Hospital infection control concerns personnel. 70% of them knew Duration to re-autoclave dressing drum. 30% of them knew IV set can be used for how many days. 60% of them knew what should be used for cleaning Blood stain on the floor. 43.3% of them knew how the Sharps container should be. 33.3% of them knew while handling biomedical waste what staff must ware. 66.7% of them knew whose responsibility is biomedical waste management. 40% of them knew the texture of Sharps container. 40% of them knew Recapping of used needles is done or not. 53.3% of them knew how much is 1% Hypo chloride solution. 33.3% of them knew What is the concentration of savlon solution used for cleaning in hospital. 53.3% of them knew the stages of biomedical waste management. 43.3% of them knew in which colour container Human anatomical waste is discarded.

The association between level of knowledge regarding biomedical waste management and the selected demographic variables was assessed using Fisher's exact test.

Since p-values corresponding to age and years of experience are small (less than 0.05), age and years of experience of Nursing officers were found to have significant association with knowledge regarding biomedical waste management.

### Limitations

The following points were beyond the control of the investigator:

- Study is limited only those who are willing to participate in the study
- Study is limited to a House keeping staff
- Study is limited to qualified staff nursing staff

Study is limited to only Hospital.

### Recommendations

Following study can be undertaken in relation to present study.

- It is suggested that the study may be used in a larger population of nursing staff.
- This study can be done in different districts of Maharashtra and in different states of India.
- A comparative study can be done in rural areas 'A study to assess the knowledge regarding biomedical waste management among Nursing officers in selected areas Pune

A study should be undertaken to assess the attitude of doctors

### Acknowledgement

"Lord, thank you for walking with us through the seasons of our lives. Let us be grateful to the people who make us happy; they are the charming gardeners who make our souls blossom."

It is something beyond one's human ability to put in words one's sincere feeling of gratitude to those whom one Owes something.

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The proverb that 'One can never make it alone', could never be truer than in this situation. I have so many well-wishers that I find it impossible to name them all however, deep down in my heart; I shall always remember each and every one of them for their contribution.

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