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## NOVICE NURSES AND BIOMEDICAL WASTE MANAGEMENT: ASSESSING THE RETENTION AND APPLICATION OF THEIR KNOWLEDGE AND ATTITUDE REGARDING BIOMEDICAL WASTE MANAGEMENT

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### ABSTRACT

Hospitals could be the potential area of acquiring infections if the hospital generated wastes are not handled carefully. The proper disposal of these health care wastes known as Biomedical wastes is mandatory as they have the potential of causing infection. Infection control is part of the nursing curriculum and all nursing students are thought theoretically how to manage the biomedical wastes. Has the theory helped during practise in clinical settings? The answer for this question was the aim of this research article where the fresh graduates currently working as staff nurses known as novice were surveyed upon. The study concluded that their knowledge regarding the topic was fresh and adequate and a positive correlation was established between the knowledge and attitude of the novice nurses towards practising biomedical waste management.

### KEYWORDS

Novice, Infection, Biomedical Waste, Disposal, Nursing Curriculum, Transition and Healthcare.

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### INTRODUCTION

Waste generation is increasing day by day globally and is a challenge to a pollution free environment. Hospitals are one of the major contributors of waste in addition to wastes produced by houses<sup>1</sup>. Hospitals generate pathological wastes which usually

comprises of two major categories, solid or semisolid wastes and liquid wastes<sup>2</sup>.

Safe Disposal is the key element in managing the biomedical wastes and preventing the transmission of infectious diseases<sup>3</sup>. The government of India introduced a rule in 1998 “Biomedical Waste (Management and Handling) which emphasized the need for safe disposal of biomedical wastes. The nurses and doctors those who come in direct contact with these wastes and hence need to handle these wastes appropriately<sup>4</sup>. Research evidence have found that there is a high risk of acquiring infection through a used needle stick injury and among this 30% are affected with HBV, 1.8% of them with HCV and 0.3% with HIV<sup>5</sup>. The Centre for Disease Control presses the need for prevention of infection among nurses. When a look was taken into the volume of solid wastes produced in hospitals in India are between 1 – 2.2kg/day/bed<sup>6</sup>.

#### **Need for the study**

The researchers came out with this study in the curiosity to know if their curriculum which has a well- designed concept of Biomedical Waste Management had an impact on their practices in the wards without additional training. A reduction in organising expensive workshops related to this concept can be achieved and the resources can be utilized for advanced skills.

#### **Objectives of the study**

To assess the retention of theoretically acquired knowledge of novice nurses.

To assess the implementation of their acquired knowledge into practice.

To assess the novice nurse’s attitude towards biomedical waste management.

To correlate the knowledge and attitude on Biomedical Waste Management.

### **METHODOLOGY**

Research designs are a blueprint for conducting a study. The research design spells out the basic strategies that researchers adopt to develop evidence that is accurate and interpretable.

#### **Descriptive Survey Design**

Survey studies are the investigations in which self-reported data are collected from samples for

describing populations on variables of Interest. The research design selected for this study is Descriptive Survey Design.

#### **Setting of the study**

The chosen setting for the Unit was the PSG Hospital, a 900 bedded multi-specialty Hitech Hospital.

#### **Population**

The samples recruited for the study were the newly recruited staff nurses who were fresh graduates from nursing institutes without prior working experience. The process of recruitment of samples were done by collecting the recently recruited nurses for the academic year in the PSG Hospital from the HR department with permission. 73 novice nurses were identified suitable for our inclusion criteria.

#### **Sampling**

We chose samples using the convenient sampling technique.

#### **Criteria for selection of Novice Nurses**

The term “Novice Nurses” in the study are defined by the following inclusion criteria.

Newly joined nurses to the hospital.

Graduated from the nursing programme Diploma/Bachelor’s /Post Basic recently within 6 months.

Has not had any specific training in the form of workshop regarding Biomedical Waste Management.

#### **Description of the Research Tool Used**

The research tool had four sections.

#### **Section A**

This section covered the demographic data including the age, sex, educational qualification, months of experience, year of graduation and attendance of workshop.

#### **Section B**

This section had 20 multiple choice questions related to Biomedical Waste Management. The questions were prepared and scattered under areas of assessing “Knowledge, Application, Analysis, and Skill”. It was done this way to assess the implementation of their acquired knowledge during nursing education into clinical practice. The MCQ had one lead question and 4 distractors.

### **Section C**

This section intended to be in the form of an “icebreaker” from the usual research questionnaire. It was named “Choose the Bin”. These had mention of 10 random items that is used in the hospital for patient care and goes in for disposal. The sample had to identify the right bin into which it goes. By this way, the skill aspect of the novice nurse was assessed. This also helped to assess their skills in sorting the biomedical wastes.

### **Section D**

This section included a 5 point Likert Scale which was developed in order to assess the novice nurses attitude towards biomedical waste management. The tool in all had 10 statements where it focuses on BMW as a responsibility, infection control, awareness of policy related to BMW, time consuming, if training is essential.

### **Validity**

The tool was sent to 5 experts in the field to check for the content validity and relevance of the items in the questionnaire. Based on review comments, slight modifications were made on the tool.

## **DATA COLLECTION**

### **Ethical Clearance**

The research Proposal was submitted to the IHEC (Institutional Human Ethics Committee). After the review comments and corrections, resubmission was done. The study began after the ethical approval.

### **Consents and Permission**

The Nursing Directorate at the Hospital was informed about the purpose of the research and permission was obtained to conducted the data collection among the chosen Novice Nurses. The agreement of sharing the research findings with the CNE committee was also made through the nursing directorate.

### **Pilot Study**

A pilot study was done on 10 samples from the obtained lists just to know the feasibility of conducting study. After the pilot study, we were able to understand the minimum time required for filling the questionnaire, also a few questions were remodified for better clarity. The novice nurses involved in the pilot were not included for the main

study. Hence the sample size for the proposed study was reduced to 63 nurses.

### **Initial Preparation**

The authors initially met to get their responsibilities towards data collection because the nurses were scattered in different shifts and in different wards. The agreement in tracing the samples during their shifts were made and data collection was divided among all.

### **Data Collection**

The Informed consent was taken from the participants. The self-administered research tool was given to them and ensured that they filled it without any interruption to their patient care. Most of them filled during their tea break while at shift. It took less than 15 minutes per nurse to fill the questionnaire. Data was collected from 60 novice nurses, 3 of them were on leave.

## **DATA ANALYSIS AND INTERPRETATION**

### **Demographic Profile**

Using Descriptive statistics, the demographic profile was described as,

#### **Age**

The staff nurses were in the range of 20 to 24 years.

#### **Gender**

56 were females and 4 were males.

#### **Education**

48 of them had completed BSN programme and 12 were Diploma Holders.

#### **Training/Workshop Attendance**

None of them have attended any specific workshops or training on Biomedical Waste management except theoretically exposed while at college.

#### **Retention Level of Acquired Knowledge**

The collected data through the MCQ questionnaire was interpreted with Frequency. Each question had one right distractor. The frequency was analyzed for all 20 questions and scored accordingly. The obtained score out of 20 was converted into percentage and the level of Knowledge was interpreted using terms “Excellent, Good, Fair and Average”.

From the obtained results, a comparison was made between the BSN and Diploma students, Out of the 12 Diploma holders, 5 were in the category of

average 3 in the Fair category, 1 in Good and 2 in the Excellent category.

#### **Choose the Bin**

This was a paper and pen skill test where the nurses matched the random items to be disposed with the appropriate bins. This assessed the skill as well as the implementation of knowledge acquired into practice.

#### **Attitude towards Biomedical Waste management**

The 5 point Likert Scale measured the Agreement (Strongly Agree and Agree) and Disagreement (Strongly Disagree and Disagree) and Neutral Attitude of nurses. The frequency of each item scored was calculated. None of them had a disagreement which means all of them had a favourable attitude towards practicing the appropriate waste management technique.

#### **Karl Pearson's correlation coefficient**

Karl Pearson's correlation of coefficient was adopted to assess the correlation between the knowledge and attitude of nurses and the results showed a positive correlation with  $r = 0.711$ .

### **RESULTS AND DISCUSSION**

The newly recruited novice staff nurses are the most prone to have infection due to improper waste disposal. A study conducted in a tertiary hospital of West Bengal assessed the knowledge and practice among healthcare professionals. One of their major findings was that one third of the participating population was junior doctors and nurses between age group 21- 30 years. But the study recommended need for refresher trainings for biomedical waste disposal<sup>7</sup>.

There are very few studies that have tried to assess the knowledge which has been retained from exposure to their curricular learning. A study conducted among 120 nurses in multispecialty hospitals in Aurangabad was tested for knowledge before and after use of a self-instructional module. The pretest knowledge was lesser in all cadres compared to a posttest knowledge and improved gradually after the reading the module<sup>8</sup>.

Identifying the translation of theoretical knowledge into a skill is very objective from the gaming method as projected in our interpretation. Gaming makes

learning fun and participation interesting. A group of researchers figured out the effect of gaming on knowledge regarding biomedical waste management among nursing students at Bhubaneswar. It improved the knowledge in this concept significantly<sup>9</sup>. Most of the studies proved that the participants recorded a positive attitude towards the biomedical waste management<sup>10-14</sup>.

#### **Implications**

From the results of this study it was understood that the fresh graduates had good retention of acquired Knowledge during their study and were also able to apply into practice without the requirement of any additional training and Workshops. However, the comparatively lesser exposure for the Diploma Graduates in the knowledge aspects may be due to the difference in the depth of topics related to Biomedical Waste management in their curriculum. A ward orientation during the inductive period might fill the Gap without the need for an extensive workshop.

#### **Recommendations**

As the study purely focused on novice nurses, the sample size was smaller. The results would be more generalizable if novice nurses may be selected from Multiple Centers/Hospitals to have a larger sample size.

S.No	Biomedical Wastes	Right Bin N=60	Wrong Bin N=60
1	Syringes	57	3
2	Soiled cotton and Gauze	40	20
3	Vials	38	22
4	Masks and Caps	56	04
5	Gloves	52	08
6	IV Cannula	30	30
7	Body Fluids	25	35
8	Plastic Bottles	51	09
9	Catheters - Urinary	58	02

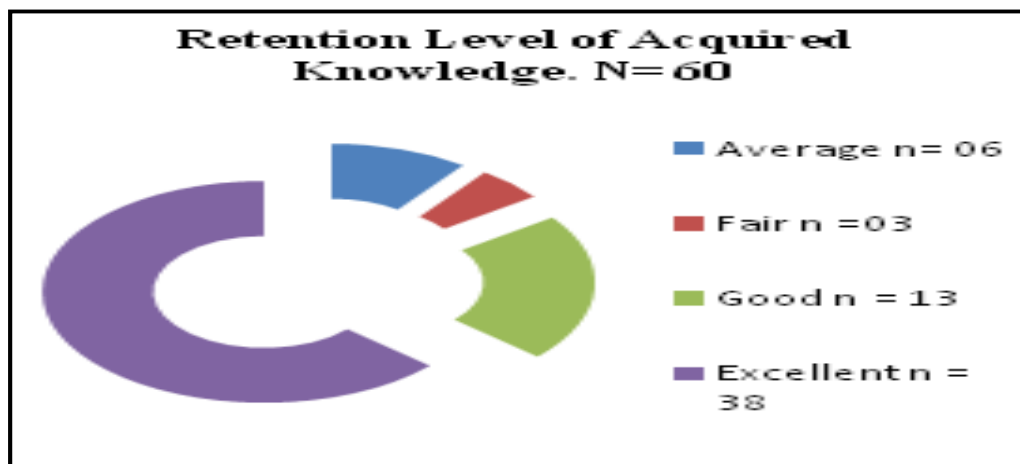


Figure No.1: Retention level of acquired knowledge

## CONCLUSION

Thus a thorough base in the curriculum helps the nurses to practice the acquired skills with less attendance of trainings and workshops but mere orientation to the practice in their workplace. However, refresher courses or hands on practice sessions may refine the obtained skills.

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## CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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