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Biomedical Waste Management among Nursing Students

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Abstract

Any waste generated during the diagnosis, treatment, or immunization of people is referred to as biomedical waste. It is now well established that hospital waste produced during patient care has a variety of adverse and harmful consequences on the environment, including people. Assessment of knowledge, attitude, and practice of biological waste management (BWM) was one of the study's main objectives. The study used a descriptive research design and non-probability volunteer selection techniques to gather a sample of 100 nursing students who met the inclusion criteria. A questionnaire, a standardized method for evaluating knowledge, attitude, and practice of BWM, was used for the pre-test and post-test. The pretest mean was 56.51 (Standard deviation: 20.5229). Chi square analysis revealed that, with the exception of education and training, there was no significant correlation between demographic factors. The results showed that regular BWM training programs are necessary for nursing students to improve their skill on BWM.

Key Words: *Biomedical waste management, Nursing students, Awareness*

1. Introduction:

As healthcare facilities grow, there is a daily increase in the creation of biological waste. If BWM is carried out correctly, several problems can be avoided. Biological waste is typically separated, stored, processed, transported, and disposed of as part of health care waste management. If we want to see improved results, we must immediately increase the level of training and instruction in biomedical waste and environmentally friendly health care while adhering by all relevant rules and regulations [1].

Waste produced during medical operations carries a larger risk of infection than other types of rubbish. Lack of knowledge on how to manage medical waste appropriately can harm both the environment and one's health. India produces 0.33 million tons annually [2]. No matter where it is created, it is essential to treat biomedical waste safely and properly.

Although there are laws in place (Rules 1998) to reduce the population's exposure to infectious and toxic hospital waste, these laws have not yet been properly implemented [3]. Poor waste management, ignorance of the health concerns posed by biological wastes is the most important problems with healthcare waste [4]. India's degree of awareness is deemed to be inadequate, despite the fact that health professionals worldwide are more aware of the hazards and the appropriate management measures [5].

The proper understanding of the health risk posed by hospital waste, appropriate handling procedures, and practice of safety measures can help to ensure the safe disposal of hazardous hospital waste and protection of the population from the numerous harmful repercussions of the hazardous waste.

One of a healthcare worker's most crucial duties is to handle biomedical waste created in a facility properly because incorrect management of this waste not only puts people and the environment at risk but might also

result in legal action against hospital administration [6]. Given this context, the primary objective of this study was to evaluate the knowledge on BWM among nursing students.

Hospital Waste Management - Color Coding

The most recent standards for bio-medical waste segregation in India advocate color coding in the following shades: red, yellow, blue, white, and black. (Figure 1):

Figure 1: Hospital Waste Management

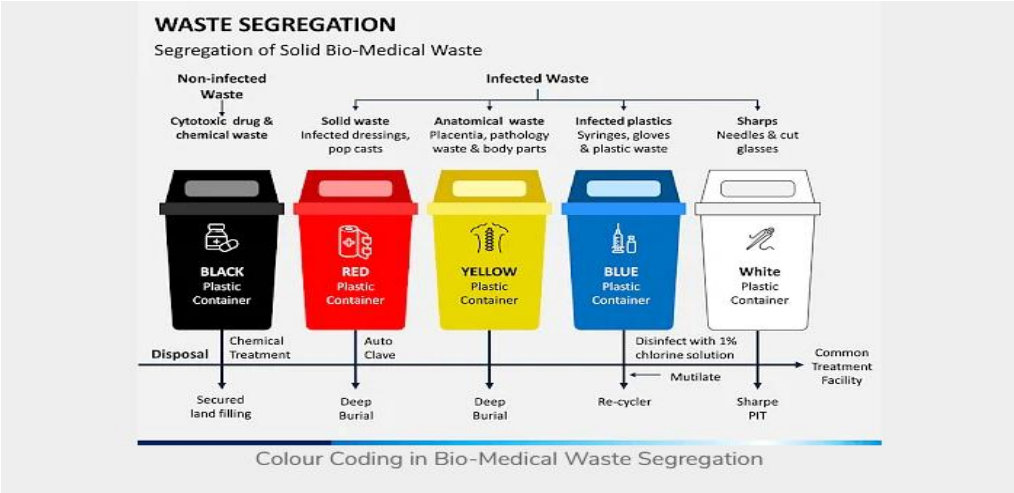

Figure 1 shows different color codes used for segregation of waste, red is for solid and infectious waste, yellow is for plastic and body parts waste, blue and white are for non-hazardous waste, and black is for hazardous garbage.

2. Objective

Assessment of knowledge, attitude, and practice of biological waste management (BWM) was one of the study's main objectives

3. Methods:

Non-experimental descriptive research design was chosen as the study's research method. 100 nursing students who met the inclusion criteria were collected using a non-probability convenience sampling technique. Demographic data including age, sex, education, kind of job, marital status, years of experience, and participation in continuing nursing education programs were gathered using a structured interview schedule. The 30-item questionnaire includes multiple-choice questions that measure Knowledge, attitude, practice on BWM in the areas of definition, segregation, treatment, and management. Each multiple-choice question in the Knowledge, attitude, and practice sections has four possibilities and one right answer. The score is one for each accurate response. There was a 30-point scoring range. The subjects were grouped according to their scores (Table 1). The data were gathered at the hospitals in the Namakkal District over the course of six weeks. Each student was introduced along with the purpose of the interview before it began. To evaluate the Knowledge, attitude, practice related the management of biomedical waste; data were gathered through planned interviews using a semi-structured questionnaire and checklist.

Table 1: Knowledge, attitude, practice level

S. No	Knowledge level	Score
1	Adequate level	75% and above
2	Moderate level	50 – 74%.

3	Inadequate level	Below 49%

Table 1 show 75 % and above belongs to adequate level, 50-74% moderate level and below 49% is inadequate level.

4. Result:

Figure 2: Frequency and percentage distribution of samples based on Knowledge, attitude, practice on BWM

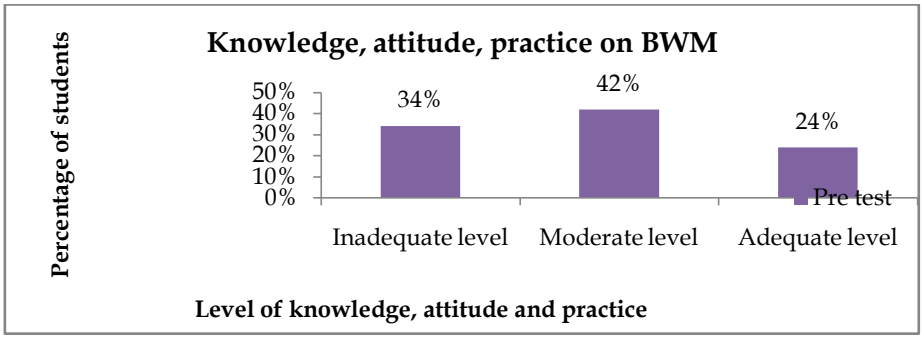

Figure 2 shows frequency and percentage distribution of samples according to the knowledge score of health care personnel regarding biomedical waste management. It reveals that 34% of health care personnel had inadequate, 42% of health care personnel had moderate level, and 24% of health care personnel had adequate level.

Table 2: Knowledge, attitude, practice on BWM

Group	Mean	SD
Pretest	56.51	20.5229

Table 2 shows that the average pre test scores on level knowledge and practice regarding biomedical waste management among health care personnel at a tertiary care hospitals is 56.51 (SD 20.5229)

Table 3: Association between knowledge, attitude and practice on BWM with their selected demographic variables.

S. No	Demographic variable		Knowledge, attitude, practice level			Chi square value	Table value	Inference
			>49%	50-74%	>75%			
1.	Age (years)	21–25	1	15	9	8.1431	9.488	NS
		26–30	11	16	8			
		31&above	22	11	7			
2.	Sex	Male	6	7	5	0.184	5.991	NS
		Female	28	35	19			
3.	Marital status	Married	15	13	12	2.6727	5.991	NS
		Unmarried	19	29	12			
4.	Education	PG Degree	1	8	11	31.7314	12.02	S*
		UG Degree	5	20	5			

		Diploma	17	9	4			
		Others	11	5	4			
5.	Religion	Hindu	34	20	14	5.3351	9.488	NS
		Muslim	0	15	6			
		Christian	0	7	4			
7.	Training	Yes	15	35	20	16.4332	5.991	S*
		No	19	7	4			

Table 3 shows that level of KAP on biomedical waste management has not been influenced by age, sex, marital status, religion, except education, training.

5. Discussion:

The aim of the study was to evaluate the knowledge, attitude and practice of BWM among health care personnel. The study's findings show that nursing students need to make plans to increase their knowledge even if they have a basic understanding of biomedical waste management and routinely attend training sessions. According to a study by Mathur. V in the city of Allahabad, the significance of training in biomedical waste management needs to be emphasized. Appropriate waste disposal practices are impacted by inadequate knowledge of biomedical waste management [7]. All healthcare personnel, particularly group D workers, need to regularly participate in training programs on biological waste management and its risks, according to the results of another study done by Basavaraj. Along with educational efforts, it is crucial to strictly adhere to biological waste management regulations and monitor them at all levels [8]. After doing research, Kulumina came to the conclusion that nursing professionals' knowledge, attitudes, and practices regarding the management of biomedical waste were satisfactory. Our study found that nurses were completely immunized against hepatitis B (100%) thanks to a hospital policy that offered free vaccinations to high-risk groups. By giving nurses a sense of security, such policy choices actually have a favorable effect on how effectively they perform their jobs. [9].

Khubchandani K did a study, and she came to the conclusion that all pupils generally had a positive attitude about the safe management of BMW. However, educational institutions need to pay attention to this knowledge and practice in order to provide ongoing educational programs and oversee proper waste disposal. This was supported by the finding that students with higher education levels performed better on this subject [10]. In a study done in Cairo, Hakim and She found that, with the exception of nurses with more work experience, who were more likely to have satisfactory knowledge about waste disposal than less experienced nurses, training and the length of work experience were not significantly associated with knowledge, attitude, and practice scores[11]. A study conducted by Kumar. D at the SRM Institute of Science and Technology in Chennai revealed that none of the staff nurses had adequate understanding of biological waste management, while 25% of the staff nurses had just moderate knowledge [12]. To attain the goal of a green and clean environment, Bansod H S conducted a review research and advised that the creation of ecologically friendly procedures as well as the proper strategy and processes for the disposal of BMW are crucial. This review article's objective is to present systematic, evidence-based data combined with an in-depth examination of BMW in an organized manner [13].

The results of the study led to the conclusion that all nursing students, especially group D professionals, require ongoing training on BWM and associated risks. Along with educational interventions, it is crucial to strictly adhere to the rules for managing biomedical waste and to monitor those rules at all levels.

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