

A Study to Assess Knowledge on Biomedical Waste Management among Staff Nurses at Noor Hospital, Warudi, Jalna

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Abstract

Background: Biomedical waste (BMW) generated in healthcare settings poses serious health and environmental risks if not managed properly. Nurses play a pivotal role in biomedical waste management; therefore, adequate knowledge among staff nurses is essential for effective implementation of biomedical waste management rules. **Objective:** To assess the knowledge regarding biomedical waste management among staff nurses working at Noor Hospital, Warudi, Jalna, and to determine the association between knowledge levels and selected demographic variables. **Methods:** A quantitative descriptive research design was adopted. Thirty staff nurses were selected using a non-probability purposive sampling technique. Data were collected using a structured knowledge questionnaire during January 2025. Descriptive and inferential statistics were used for data analysis. **Results:** The study revealed that 90% of staff nurses had average knowledge, 6.67% had good knowledge, and 3.33% had poor knowledge regarding biomedical waste management. A statistically significant association was found between knowledge levels and years of experience as well as designation ($p < 0.05$). **Conclusion:** Although most staff nurses demonstrated an average level of knowledge, gaps remain in comprehensive understanding of biomedical waste management. Regular training programs, continuous monitoring, and strict adherence to guidelines are recommended to improve compliance and ensure safe waste handling practices.

Keywords: Biomedical Waste Management, Knowledge, Staff Nurses.

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INTRODUCTION

Biomedical waste management is a critical component of hospital infection control and environmental safety. Biomedical waste is generated during diagnosis, treatment, immunization, or research activities involving human beings or animals. Improper handling and disposal of biomedical waste may lead to the transmission of serious infections such as HIV, hepatitis B, and hepatitis C, posing significant risks to healthcare workers, patients, and the community.

In India, the rapid expansion of healthcare services has resulted in an increased generation of biomedical waste. To address this issue, the Government of India has mandated proper segregation, handling, and disposal of biomedical waste through the Biomedical Waste Management Rules. Nurses, being primary caregivers and frontline healthcare workers, are directly involved in biomedical waste handling. Therefore, adequate knowledge and awareness among staff nurses

are essential to ensure compliance with guidelines and to minimize occupational and environmental hazards.

METHODS

Study Design and Approach

A quantitative approach with a descriptive research design was used to assess the knowledge of staff nurses regarding biomedical waste management.

Setting and Sample

The study was conducted at Noor Hospital, Warudi, Jalna. A total of 30 staff nurses who fulfilled the inclusion criteria were selected using a non-probability purposive sampling technique.

Inclusion and Exclusion Criteria

Staff nurses who were willing to participate, available during the data collection period, and able to understand English were included in the study. Nurses who were sick or unable to cooperate during the study period were excluded.

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Data Collection Tool

A structured knowledge questionnaire on biomedical waste management was used. Content validity was established through expert review. Reliability was assessed, and the reliability coefficient was found to be 0.8.

Data Collection Procedure

Permission was obtained from the concerned hospital authorities. Data were collected during January 2025. Participants were informed about the purpose of the study and were given adequate time to complete the questionnaire.

Data Analysis

Data were analyzed using descriptive statistics (frequency and percentage) and inferential statistics (chi-square test) to determine the association between knowledge levels and selected demographic variables.

Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee of the concerned nursing college. Permission was obtained from hospital authorities, and informed consent was taken from all participants. Confidentiality and anonymity were maintained throughout the study.

RESULTS

Demographic Characteristics

Among the participants, 43% were aged 21–25 years, 47% were aged 25–30 years, and 10% were above 30 years. Females constituted 63% of the sample, while 37% were males. Most of the staff nurses (80%) had 3–6 years of work experience. Regarding educational qualification, 80% were RANM and 20% were RGNM. About 63% of the participants had not received any prior training on biomedical waste management.

Knowledge Level on Biomedical Waste Management

The study findings showed that 90% of staff nurses had average knowledge (score 10–20), 6.67% had good knowledge (score >20), and 3.33% had poor knowledge (score <10) regarding biomedical waste management.

Association between Knowledge and Demographic Variables

A statistically significant association was found between knowledge level and years of experience as well as designation ($p < 0.05$). No significant association was observed between knowledge level and other demographic variables.

DISCUSSION

The present study revealed that the majority of staff nurses possessed an average level of knowledge regarding biomedical waste management. Similar findings were reported by Deepak *et al.*, who observed moderate

knowledge levels among healthcare students regarding biomedical waste management. Hina *et al.* also reported that nurses demonstrated better knowledge compared to other healthcare workers, with work experience significantly influencing knowledge levels.

The significant association between knowledge and years of experience in the present study suggests that clinical exposure plays an important role in enhancing understanding of biomedical waste management. However, the limited proportion of nurses with good knowledge highlights the need for regular in-service education and structured training programs.

The lack of prior training among a majority of participants may explain the observed knowledge gaps. Continuous education, strict supervision, and the availability of color-coded waste bins are essential to improve biomedical waste management practices in hospital settings.

CONCLUSION

The study concludes that while most staff nurses had an average level of knowledge regarding biomedical waste management, comprehensive understanding remains insufficient. Regular training programs, reinforcement of biomedical waste management guidelines, and provision of necessary infrastructure are recommended to ensure safe and effective biomedical waste management practices. Strengthening nursing education and continuous professional development can significantly improve compliance and reduce health and environmental hazards.

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