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Research Article

A Study To Assess The Knowledge Of Biomedical Waste Management Among Housekeeping Staff Working At SMVMCH

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Abstract:

Background: Biomedical waste management is an essential component of infection control and environmental safety in healthcare settings. Housekeeping staff are directly involved in the collection, segregation, handling and disposal of biomedical waste, making adequate knowledge important for safe waste management. **Objective:** To assess the level of knowledge regarding biomedical waste management among housekeeping staff at SMVMCH and to determine the association between knowledge and selected demographic variables. **Methods:** A quantitative research approach with a descriptive research design was adopted. The study was conducted at Sri Manakula Vinayagar Medical College and Hospital, Puducherry. A total of 50 housekeeping staff were selected using purposive sampling. Data were collected using a structured knowledge questionnaire consisting of demographic variables and questions related to biomedical waste management, including definitions, segregation, colour coding, handling, disposal and safety measures. Descriptive statistics and Chi-square test were used for analysis. **Results:** Among the 50 housekeeping staff, 58% were aged 40–50 years, 98% were female, 98% had schooling education, and 100% had a monthly income of Rs. 5,000–10,000. Most were married (94%), lived in terrace houses (72%), belonged to nuclear families (74%), were Hindu (96%), lived in rural areas (78%), and had 7–8 years of hospital work experience (48%). Regarding knowledge, 84% had adequate knowledge and 16% had highly adequate knowledge; none had moderate, inadequate or highly inadequate knowledge. Education showed a statistically significant association with knowledge ($\chi^2 = 5.375$, $p = 0.021$), whereas age, sex, income, marital status, type of house, type of family, religion, residential area and years of working experience were not significantly associated with knowledge. **Conclusion:** The majority of housekeeping staff had adequate knowledge regarding biomedical waste management. Educational status was significantly associated with knowledge. Regular training, supervision and reinforcement of biomedical waste management procedures are recommended.

Keywords: Biomedical waste management; housekeeping staff; knowledge; waste segregation; colour coding; hospital.

INTRODUCTION

Biomedical waste is any solid and/or liquid waste, including its container and intermediate products, generated during the diagnosis, treatment or immunization of human beings or animals, or during related research, production and testing activities. Healthcare facilities generate different categories of waste, including anatomical, infectious, pathological, pharmaceutical, chemical, radioactive and sharps waste. Improper handling and disposal can expose healthcare workers and the community to infection, injury and environmental hazards.

Healthcare waste management begins with waste generation and segregation at the source and continues through collection, storage, disinfection, transportation, treatment and final disposal. Proper segregation is particularly important because it reduces the amount of infectious waste requiring special treatment and prevents hazardous materials from being mixed with general waste.

Housekeeping staff are among the important personnel involved in the practical handling and movement of biomedical waste within hospitals. Their knowledge of colour coding, safe handling, personal protective equipment, sharps disposal and reporting of injuries is essential for preventing occupational exposure and maintaining hospital infection-control standards.

Although biomedical waste management rules and guidelines are available, gaps in knowledge and compliance may still occur in healthcare settings. Therefore, assessment of knowledge among housekeeping staff is necessary to identify areas requiring reinforcement and training. The present study

was undertaken to assess knowledge of biomedical waste management among housekeeping staff working at SMVMCH, Puducherry.

NEED FOR THE STUDY

Biomedical waste mismanagement can result in infection transmission, occupational injuries and environmental contamination. Housekeeping staff are first-line workers in the collection and handling of hospital waste and may be exposed to contaminated materials, sharps and other hazards. The source study highlights continuing concerns related to inadequate awareness of segregation, colour coding, handling and disposal procedures.

Previous studies cited in the study have reported variable levels of biomedical waste management knowledge among healthcare and housekeeping personnel. Some studies demonstrated gaps in knowledge and practice, whereas educational interventions produced improvement in knowledge. Assessing the existing knowledge of housekeeping staff at SMVMCH is therefore important for identifying educational needs and strengthening safe biomedical waste management.

STATEMENT OF THE PROBLEM

A study to assess the knowledge of biomedical waste management among housekeeping staff working at SMVMCH.

OBJECTIVES

- To assess the level of knowledge regarding biomedical

waste management among housekeeping staff at SMVMCH.

- To associate the level of knowledge regarding biomedical waste management among housekeeping staff at SMVMCH with their selected demographic variables.

MATERIALS AND METHODS

Research approach: A quantitative research approach was adopted.

Research design: A descriptive research design was used to explore and document the level of knowledge of housekeeping workers.

Setting: The study was conducted at Sri Manakula Vinayagar Medical College and Hospital (SMVMCH), Puducherry.

Population: The target population included all housekeeping workers at SMVMCH, Puducherry.

Sample: The study sample consisted of housekeeping workers who met the inclusion criteria.

Sample size: The sample consisted of 50 housekeeping workers.

Sampling technique: Purposive sampling technique was used for the present study.

Inclusion criteria: Housekeeping workers aged 30–55 years; willing to participate with informed consent; available at the time of data collection; and present on the day of data collection.

Exclusion criteria: Participants above 50 years of age and those unwilling to participate in the study, as stated in the source methodology.

Tool: Section A consisted of demographic variables including age, sex, education, income, type of house, type of family, religion, residential area and years of working experience in the hospital. Section B consisted of a knowledge-based questionnaire related to biomedical waste management, including definitions, practices, absorbents used, disposal methods and colour coding.

Scoring: The knowledge questionnaire contained 30 items. Scores of 25–30 were classified as highly adequate, 19–24 as adequate, 13–18 as moderate, 7–12 as inadequate and 0–6 as highly inadequate.

Data collection procedure: Prior permission from hospital authorities and informed consent from participants were obtained. The purpose of the study was explained to the housekeeping staff. The questionnaire was administered in the hospital setting, instructions were provided and doubts were clarified when necessary. Confidentiality of responses was assured.

Data analysis: Frequency, percentage, mean and standard deviation were planned for descriptive analysis. Chi-square test was used to assess the association between knowledge and selected demographic variables.

RESULTS IN PARAGRAPH

Table 1 shows that 58% of housekeeping staff were aged 40–50 years, 32% were above 50 years and 10% were aged 30–40 years. Most participants were female (98%). Regarding education, 98% had schooling education and 2% were graduates. All participants (100%) had a monthly income of Rs. 5,000–10,000. The majority were married (94%), while 6% were categorized under the extended marital-status category. Most participants lived in terrace houses (72%), followed by semi-pucca houses (18%) and pucca houses (10%). Table 1 further shows that 74% of participants belonged to nuclear families and 26% to joint families.

Regarding religion, 96% were Hindu and 4% were Christian. Most participants lived in rural areas (78%), while 22% lived in urban areas. With regard to hospital work experience, 48% had 7–8 years of experience, 32% had more than 8 years, 16% had 4–6 years and 4% had 1–3 years of experience.

Table 2 shows that 84% of housekeeping staff had adequate knowledge regarding biomedical waste management and 16% had highly adequate knowledge. None of the participants had moderate, inadequate or highly inadequate knowledge.

Table 3 shows that education had a statistically significant association with the level of knowledge regarding biomedical waste management ($\chi^2 = 5.375$, $p = 0.021$). The source study reported no significant association between knowledge and age, sex, income, marital status, type of house, type of family, religion, residential area or years of working experience.

DISCUSSION

The present study assessed knowledge regarding biomedical waste management among 50 housekeeping staff working at SMVMCH. The findings showed that 84% had adequate knowledge and 16% had highly adequate knowledge, with none having moderate, inadequate or highly inadequate knowledge. This indicates that the participants generally demonstrated a favourable level of knowledge regarding biomedical waste management.

The present finding is supported by Gopalakrishnan et al. (2021), as cited in the study, who reported that the majority of healthcare workers had adequate knowledge and no intermediate or inadequate knowledge levels. The similarity suggests that healthcare workers who are routinely exposed to biomedical waste may possess adequate basic knowledge of waste management procedures.

The finding differs from the study by Chindhana K., Kanimozhi and colleagues (2021), which reported that 70% of housekeeping workers had inadequate knowledge, 26% had moderately adequate knowledge and only 4% had adequate knowledge. The difference may be related to variations in setting, previous training, work exposure and institutional practices.

The present study also found a significant association between educational status and knowledge ($\chi^2 = 5.375$, $p = 0.021$). This finding is supported by Mahesh et al. (2025), as cited in the source study, who reported a significant association between higher education and better biomedical waste management knowledge, while age, sex and years of experience did not show significant associations.

No significant association was observed between knowledge and age, sex, income, marital status, type of house, type of family, religion, residential area or years of working experience. This indicates that educational status was the principal demographic characteristic associated with knowledge in the present study.

CONCLUSION

The study concluded that the majority of housekeeping staff at SMVMCH possessed adequate knowledge regarding biomedical waste management, while a smaller proportion demonstrated highly adequate knowledge. Educational status was significantly associated with knowledge, whereas the other selected demographic variables were not significantly associated. Continuous training, supervision and reinforcement of biomedical waste management procedures are important for maintaining safe practices.

NURSING IMPLICATIONS

Nursing Practice: Nurses should guide and supervise housekeeping staff in correct biomedical waste segregation and disposal. Regular teaching and reminders should be provided, and appropriate personal protective equipment should be encouraged during waste handling.

Nursing Education: Nursing students should be educated regarding biomedical waste management so that they can participate in health education and training of housekeeping staff. Demonstrations on colour coding and safe handling should be incorporated into teaching.

Nursing Administration: Hospital administrators should provide adequate training programmes for housekeeping staff. Colour-coded bins, posters and protective equipment should be available, with regular supervision and audits to ensure proper waste handling.

Nursing Research: Further studies should be conducted to improve knowledge and practices of biomedical waste management among housekeeping staff and to evaluate the effectiveness of educational interventions.

REFERENCES

- Regular training programmes on biomedical waste management should be provided for housekeeping staff.
- Colour-coded waste segregation charts should be displayed in all working areas.
- Necessary personal protective equipment and waste disposal materials should be available at all times.
- Periodic supervision and audits should be conducted to ensure compliance with biomedical waste management guidelines.
- Further studies may be conducted using larger samples and different hospital settings.

LIMITATIONS

- Self-reported data may not accurately reflect actual knowledge or behaviour.
- Time constraints and staff availability may limit participation.
- The study does not cover other categories of hospital staff such as nurses or technicians.

REFERENCES

1. Achary, D. B., & NectaSingh. (2000). The book on hospital waste management. New Delhi: Minerva Press.
2. Basavanthappa, B. T. (2010). Nursing research (1st ed.). Jaypee Brothers Medical Publishers, New Delhi.
3. Bertin, M. L. (1996). The communicable disease, infection prevention of nurses at work and at home nurse cline, North America, 509–526.
4. Sharma, S. K. (2012). Nursing research and statistics (1st ed.). Elsevier.
5. Patil, S. P., Tambe, M. P., Patil, P. J., & Bhagwat, V. R. (2013). Awareness of healthcare workers regarding biomedical waste management at tertiary care government hospital in Dhule, Maharashtra. NJIRM.
6. Hegde, V., Kulkarni, R. D., & Ajantha, G. S. (2007). Biomedical waste management. Journal of Oral and Maxillofacial Pathology, 11(1), 5–9.
7. Mathur, P., Patan, S., & Shobhawat, A. S. (2012). Need of biomedical waste management system in

hospitals – an emerging issue – a review. International Research Journal of Environment Science.

8. Saini, S., Nagarajan, S. S., & Sharma, R. K. (2005). Knowledge, attitude and practices of bio-medical waste management amongst staffs on tertiary level hospital in India. Journal of the Academy of Hospital Administration, 17(2).
9. Singh, K., & Arora, S. K. (2004). Bio-medical waste management in the U.T., Chandigarh. Journal of Environmental Science and Engineering, 46(1), 55–60.
10. Moanjini, M. J. (2014). A study to assess the knowledge on biomedical waste disposal among Group-D workers in Sri Ramakrishna Hospital at Coimbatore. Asian Pacific Journal of Health Sciences, 1(4), 465–470.
11. Panneerelvam, S. (2016). A study to assess the knowledge on biomedical waste management among nurses working in hospital at Madurai. International Journal of Health Sciences and Research, 8(6).
12. Kumar, P. V. S. (2017). Knowledge, attitude, practices of biomedical waste management among nursing students and staff in a tertiary care hospital. Annals of International Medical and Dental Research, 4(3), 1.
13. Radha, K. V., Kalavani, K., & Lavanya, R. (2009). A case study of biomedical waste management in hospitals. Global Journal of Health Sciences, 1, 82–88.
14. Puranik, D. S., Nagaraju, B., Padmavathi, G. V., Shantharaj, M. P., & Sampulatha, S. P. (2013). A study to assess the knowledge and practice on biomedical waste management among health care providers working in PHCs of Bagepalli Taluk with the view to prepare informational booklet. International Journal of Medical and Biomedical Research, 1(2), 28–35.
15. Srivastava, J. (2016). A study to assess the knowledge regarding biomedical waste management among the staff nurses. International Journal of Scientific and Research Publications, 7(5), 1–2.
16. Nagaraju, B. (2013). A study to assess the knowledge and practices on biomedical waste management among the health care providers. International Journal of Medical and Biomedical Research, 1(2), 29.
17. Kumar, D. (2018). A study to access the knowledge level on bio-medical waste management among the nurses in Tamilnadu. Acta Scientific Medical Sciences, 3(1), 78–87.
18. Karamouz, M., Zahraie, B., Kerachian, R., & Jaafarzadeh, N. (2007). Developing a master plan for hospital solid waste management: A case study. International Journal of Medical Informatics, 27(5), 626–638.
19. Rao, D., Dhakshaini, M. R., Kurthukoti, A., & Doddawad, V. G. (2018). A study to assess the knowledge, practices and attitude among health care professionals in tertiary care teaching hospitals. Biomedical and Pharmacology Journal, 11(3), 1737–1743.

Table 1. Frequency and Percentage Distribution of Demographic Variables of Housekeeping Staff (N = 50)

S.No.	Demographic variable	Category	f	%
1	Age	30–40 years	5	10.0
		40–50 years	29	58.0
		Above 50 years	16	32.0
2	Sex	Male	1	2.0
		Female	49	98.0
3	Education	Illiterate	0	0.0
		Schooling	49	98.0
		Graduate	1	2.0
		Postgraduate	0	0.0
4	Income	Rs. 5,000–10,000	50	100.0
		Rs. 10,001–15,000	0	0.0
		Above Rs. 15,000	0	0.0
5	Marital status	Married	47	94.0
		Unmarried	0	0.0
		Extended	3	6.0
		Widow	0	0.0
		Divorce	0	0.0
6	Type of house	Terrace	36	72.0
		Pucca	5	10.0
		Semi-pucca	9	18.0
7	Type of family	Nuclear family	37	74.0
		Joint family	13	26.0
8	Religion	Hindu	48	96.0
		Muslim	0	0.0
		Christian	2	4.0
		Others	0	0.0
9	Residential area	Urban	11	22.0
		Rural	39	78.0
10	Years of working experience	1–3 years	2	4.0
		4–6 years	8	16.0
		7–8 years	24	48.0
		Above 8 years	16	32.0

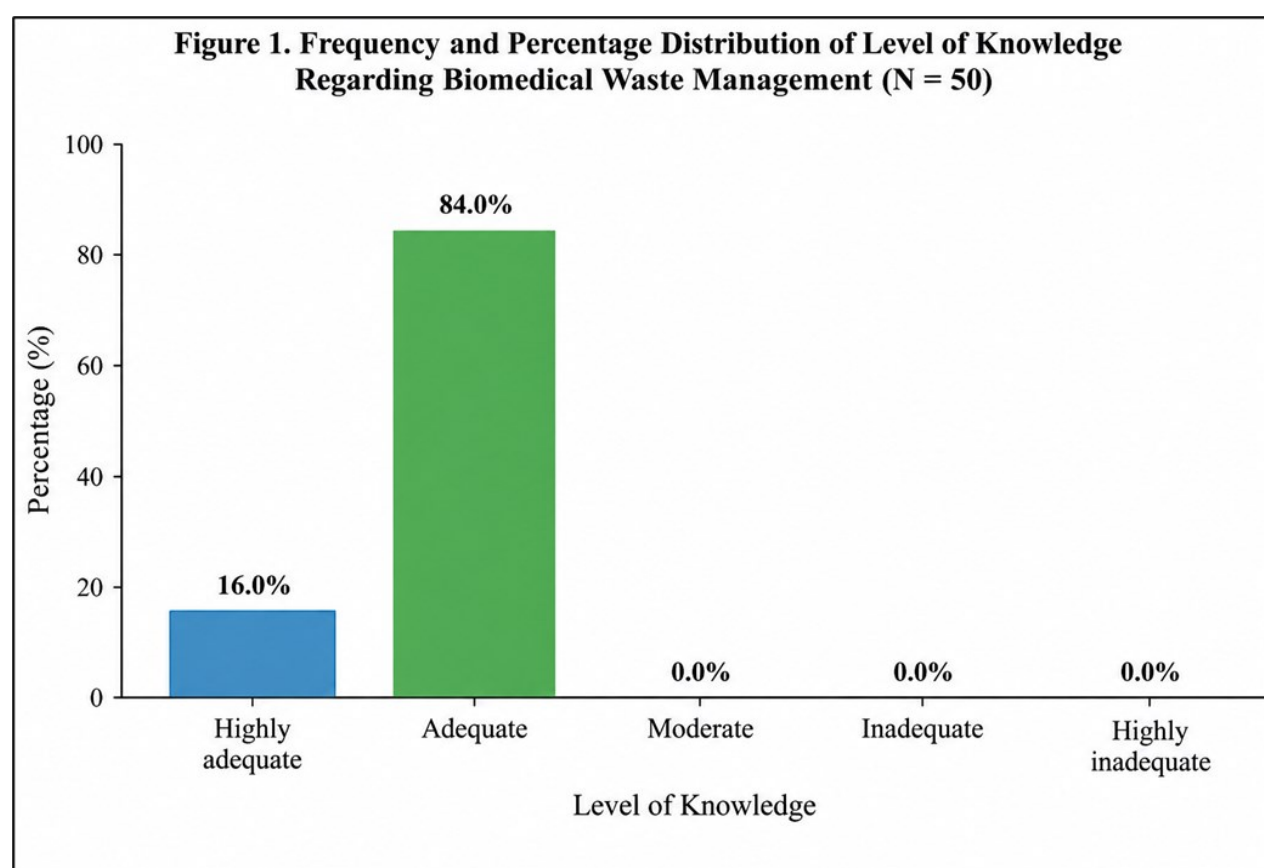
Table 2. Frequency and Percentage Distribution of Level of Knowledge Regarding Biomedical Waste Management (N = 50)

S.No.	Level of knowledge	f	%
1	Highly adequate	8	16.0
2	Adequate	42	84.0
3	Moderate	0	0.0
4	Inadequate	0	0.0
5	Highly inadequate	0	0.0

Table 3. Significant Association Between Level of Knowledge and Selected Demographic Variable (N = 50)

Demographic variable	Distribution	χ^2	df	p-value	Interpretation
Education	Highly adequate: Schooling 7 (14.0%), Graduate 1 (2.0%); Adequate: Schooling 42 (84.0%)	5.375	1	0.021	Significant

Note: The source study reported education as the only demographic variable significantly associated with knowledge. Age, sex, income, marital status, type of house, type of family, religion, residential area and years of working experience were not significantly associated with knowledge ($p > 0.05$).



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