

Factors Affecting Medical Waste Management Among Healthcare Personnel on their Competency In Level 2 Private Hospitals In Pampanga: Enhancement of Operational Development Plan

Christian Daevin F. Javines, RN, MAN¹, Dr. Erwin M. Faller²

<https://orcid.org/0009-0002-9024-1096>¹, <http://orcid.org/0000-001-8269-7304>²

St. Bernadette of Lourdes College¹, Holy Child Central College Inc.²

cd.javines@sblc.edu.ph¹, erwinfaller@hccci.edu.ph²

ABSTRACT

Healthcare waste or medical waste poses a significant threat to environmental sustainability and public health. This requires effective waste management strategies. This study explored the factors affecting medical waste management among medical personnel. A total of 200 healthcare personnel from Hospital A, Hospital B, and Hospital C, three selected Level 2 private hospitals in Pampanga. The research design is descriptive-quantitative-correlational. Three dimensions of factors in healthcare waste management served as foci of the study: environmental awareness, infection prevention and control, safety compliance, and healthcare waste management resources. Three sets of questionnaires were used to gather data. The data were analyzed and interpreted through descriptive statistics. The healthcare personnel respondents reflect a workforce of varied medical groups in their early middle adulthood and mid-career experiences. They come from diverse ethnic groups with a preponderance of Pampangos. The factors affecting medical waste management in terms of environmental awareness, infection prevention and control, safety compliance, and healthcare waste management resources are at the moderate/good level, suggesting a need to raise the level of observance in all dimensions. The level of observance of the factors in healthcare waste management is significantly associated with the demographic variables of age, position/designation, and years of experience/service but not significantly associated with ethnicity. The proposed operational plan is envisioned to enhance existing operational plans that address the factors in medical waste/healthcare waste management and competency of healthcare personnel in the target hospitals.

Keywords: Healthcare/medical waste, healthcare waste management, healthcare personnel, environmental awareness

INTRODUCTION

Healthcare waste management is essential for protecting patients, healthcare workers, the community, and the environment. Improper segregation, handling, and disposal of medical waste increase the risk of infections, occupational hazards, and environmental pollution. Effective healthcare waste management depends on healthcare personnel's environmental awareness, compliance with infection prevention and control practices, and the availability of institutional resources.

Despite existing healthcare waste management policies, many healthcare facilities continue to experience challenges in policy implementation, staff competency, and resource availability. These issues may affect compliance with waste management standards and compromise patient and environmental safety.

This study assessed the factors affecting medical waste management practices among healthcare personnel in three selected Level 2 private hospitals in Pampanga. Specifically, it examined environmental awareness, infection prevention and control, safety compliance, and healthcare waste management resources to develop an operational development plan for improving healthcare waste management practices.

Statement of the Problem

The study aimed to describe the factors affecting medical waste management among healthcare personnel in selected Level 2 private hospitals in Pampanga. The findings served as a basis for designing an operational development plan for medical waste management.

Specifically, the study sought to answer the following research questions:

1. What is the demographic profile of the healthcare personnel in the selected level 2 private hospitals in Pampanga in terms of:
 - 1.1. Age
 - 1.2. Position/Designation
 - 1.3. Years of Service
 - 1.4. Ethnicity?
2. What are the levels of factors affecting medical waste management among healthcare personnel in the selected Level 2 private hospitals in Pampanga in terms of:
 - 2.1. Environmental Awareness,
 - 2.2. Infection Prevention and Control and Safety Compliance,
 - 2.3. Healthcare Waste Management Resources?
3. Is there a significant relationship between the demographic profile and the level of factors affecting medical waste management among healthcare personnel in the selected Level 2 private hospitals in Pampanga?
4. What operational development plan can be proposed to address the factors affecting medical waste management in the target hospitals?

Scope and Delimitations

The study was conducted among healthcare personnel employed in Hospital A, Hospital B, and Hospital C, three selected Level 2 private hospitals in Pampanga. Respondents included physicians, nurses, patient care technicians, medical technologists, radiologic technologists, housekeeping personnel, material recovery facility personnel, and administrative employees. The study focused on three determinants of medical waste management practices: environmental awareness, infection prevention and control and safety compliance, and healthcare waste management resources, using a descriptive-quantitative correlational research design.

Review of Related Literature

Current literature consistently identifies environmental awareness, infection prevention and control and safety compliance, and the availability of healthcare waste management resources as major determinants of effective medical waste management. Healthcare personnel with greater environmental awareness are more likely to practice sustainable waste management behaviors, whereas adherence to infection prevention and control guidelines reduces occupational exposure and healthcare-associated infections. Studies likewise emphasize that adequate financial resources, appropriate facilities, trained personnel, and institutional support are fundamental in sustaining effective healthcare waste management programs. Collectively, these studies provided the theoretical and empirical basis for examining the factors influencing healthcare waste management practices among healthcare personnel in selected Level 2 private hospitals in Pampanga.

Theoretical Framework

This study was anchored on Endsley's Theory of Situation Awareness (1995), the Theory of Reasoned Action/Theory of Planned Behavior by Fishbein and Ajzen, and Hart's Natural Resource-Based View (NRBV) Model. These theories explain that healthcare personnel's knowledge, attitudes, behavioral intentions, environmental awareness, and institutional resources collectively influence compliance with appropriate healthcare waste management practices. They further support the premise that competency and organizational capability contribute to environmentally sustainable healthcare operations.

Conceptual Framework

The study adopted an Input–Process–Output (IPO) framework. The input consisted of the respondents' demographic characteristics and the three dimensions affecting medical waste management: environmental awareness, infection prevention and control, safety compliance, and healthcare waste management resources. The process involved data collection, statistical analysis, and interpretation of findings. The output was an operational development plan designed to enhance medical waste management practices in the participating hospitals.

METHODOLOGY

This study employed a **descriptive-quantitative correlational research design** to determine the factors affecting medical waste management practices among healthcare personnel in selected Level 2 private hospitals in Pampanga. The design enabled the researcher to describe the current status of healthcare waste management practices and examine the relationship between respondents' demographic characteristics and the identified factors affecting medical waste management.

Research Design

A descriptive-correlational approach was utilized to assess healthcare personnel's level of environmental awareness, infection prevention and control, safety compliance, and healthcare waste management resources. The study also examined whether demographic variables were significantly associated with these factors.

Research Steps

The study commenced with an extensive review of related literature and existing policies on healthcare waste management. The researchers selected, validated, and administered the research instruments after obtaining the necessary approvals from the participating hospitals. Data collected from the respondents were encoded, processed, statistically analyzed, interpreted, and utilized as the basis for developing an operational development plan to improve healthcare waste management practices.

Data Collection and Sample Selection

The respondents were 200 healthcare personnel from Hospital A, Hospital B, and Hospital C, three selected Level 2 private hospitals in Pampanga. Participants included physicians, nurses, patient care technicians, medical technologists, radiologic technologists, housekeeping personnel, material recovery facility personnel, and administrative employees. Structured questionnaires were used to collect data on environmental awareness, infection prevention and control, safety compliance, and healthcare waste management resources. Prior to data collection, informed consent was obtained from all participants, and participation was voluntary.

Data Analysis Methods

Descriptive statistics, including frequency, percentage, weighted mean, and ranking, were used to describe the respondents' demographic profile and the level of factors affecting healthcare waste management. Inferential statistics were employed to determine the significant relationship between the respondents' demographic profile and the identified factors affecting medical waste management. Statistical analyses were performed using an appropriate level of significance.

Research Hypotheses and Validation

The study tested the null hypothesis that no significant relationship exists between the demographic profile of healthcare personnel and the factors affecting medical waste management practices. The validity and reliability of the adopted research instruments were established through previous validation studies, while the researcher-developed questionnaire on healthcare waste management resources was based on recent literature and subjected to expert validation before administration.

Study Limitations and Ethical Considerations

The study was limited to healthcare personnel employed in three selected Level 2 private hospitals in Pampanga during Academic Year 2025–2026. Ethical principles were observed throughout the study by securing institutional approval, obtaining informed consent, ensuring respondent anonymity and confidentiality, and informing participants of their right to withdraw at any stage without penalty.

RESULTS AND DISCUSSION

SOP 1. What is the demographic profile of the healthcare personnel in the selected Level 2 private hospitals in Pampanga?

The study involved 200 healthcare personnel from Hospital A, Hospital B, and Hospital C, representing various healthcare professions with diverse ages, years of service, and positions.

SOP 2. What is the level of factors affecting medical waste management among healthcare personnel?

The overall level of factors affecting medical waste management was moderate (Grand Mean = 3.11). Environmental Awareness obtained the highest mean (3.16), while Infection Prevention and Control and Safety Compliance (3.09) and Healthcare Waste Management Resources (3.09) were also rated moderate. These findings indicate good practices but highlight the need for continuous improvement through training and resource enhancement.

SOP 3. Is there a significant relationship between the demographic profile and the factors affecting medical waste management?

Age, position/designation, and years of service were significantly associated with medical waste management practices, whereas ethnicity showed no significant relationship. This suggests that professional experience and job responsibilities influence healthcare waste management competency.

SOP 4. What operational development plan can be proposed?

An operational development plan was developed focusing on continuous staff training, policy reinforcement, regular monitoring, and improved healthcare waste management resources to strengthen compliance with hospital and national standards.

SUMMARY

The study assessed the factors affecting medical waste management practices among healthcare personnel in three selected Level 2 private hospitals in Pampanga. Findings revealed that environmental awareness, infection prevention and control and safety compliance, and healthcare waste management resources were generally at a moderate level. Significant relationships were found between medical waste management practices and the respondents' age, position/designation, and years of service, while ethnicity showed no significant relationship. These findings served as the basis for developing an operational development plan to strengthen healthcare waste management practices.

CONCLUSIONS

Based on the findings, healthcare personnel demonstrated satisfactory but improvable medical waste management practices. Professional experience and organizational roles significantly influenced competency in medical waste management. Continuous training, policy reinforcement, and adequate institutional resources are essential to enhance compliance and promote safe and sustainable healthcare waste management practices.

RECOMMENDATIONS

Based on the findings of the study, the following are recommended:

1. Hospitals should strengthen competency-based training on healthcare waste management.
2. Regular monitoring and evaluation of compliance with waste management policies should be conducted.
3. Adequate resources and facilities should be maintained to support effective healthcare waste management.
4. Future studies may include other healthcare institutions and additional variables to further validate the findings.

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AI DECLARATION STATEMENT

AI-supported tools helped with grammar and structure in creating this article. No AI tools were used to collect, analyze, or interpret data; all authors are credited for their academic contributions.

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