

Evaluation of nurses Attitudes Toward Medical Waste Management

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Received: 4 / 5 /2025

Accepted: 10 / 7 /2025

Published: 31 / 3 /2026

DOI:

10.65682/kjnhs.v2.i5.85-91

Abstract

Background: Medical waste puts nurses at a greater risk than others. Nurses visit the ward more than anyone which increases their chance of being exposed to hazards. It is important that they ensure the rest of the team and the community are not at risk of waste matters. The attitudes of nurses toward medical waste management are crucial for ensuring effective waste segregation, handling, and disposal practices. Positive attitudes can enhance compliance with established protocols, while negative perceptions may lead to unsafe practices, increasing the likelihood of infections and environmental contamination. Thus, the main objective of this study is to assess the level of nurse's attitudes towards medical waste management and to find out the relationship between nurses' attitudes and key sociodemographic characteristics such as age, sex, qualifications in nursing, years of experience, attending training courses and department they work in.

Methods: A descriptive cross-sectional design was employed; 318 nurses were taken from various departments. Data were collected using a specially developed questionnaire encompassing demographic characteristics and attitudes toward medical waste management.

Results: The findings revealed more than half of the sample %59.8 have a moderate level of attitudes towards medical waste management in the hospital under study. The results showed a statistically significant relationship between the sample's attitudes and their educational level, years of experience, and participation in training courses, respectively, at a significance level of 0.05%.

Conclusion: The study highlights the critical role of nurses in effective waste management and underscores the need for targeted training programs to enhance compliance and safety practices.

Keywords: Medical waste management, Nurses' Attitudes.



1. Introduction

Hospitals provide the community with many health services such as curative, rehabilitative, preventive, patient care and health education. Hospitals and healthcare organizations must look after public health which can happen by caring for patients or by maintaining a clean, hygienic environment for both their workers and the surrounding areas (Sobh, 2018). Nurses play a crucial role in healthcare waste management, making the assessment of their attitudes toward this process essential for ensuring effective and safe practices (Shafee et al., 2010). Understanding nurses' attitudes regarding medical waste (BMW) management is critical for improving waste segregation, handling, and disposal in healthcare settings (Shafee et al., 2010). This proper management is intended to decrease environmental pollution because, if not managed properly, medical waste can cause air, water, and land pollution. Collective teamwork with committed government support in finance and infrastructure development is a very important requirement for the effective disposal of medical waste (Joshi et al., 2015). Medical waste is categorized into four types: solid waste, regulated medical waste, pharmaceutical waste, and recyclable waste. Solid waste includes lightly contaminated or non-recyclable items. Regulated medical waste consists of materials saturated with bodily fluids, further split into sharps and red bag waste. Pharmaceutical waste encompasses unused, partially used, or contaminated medications (Bansod et al., 2023). Favorable attitude of waste handlers are key factors for having proper hazardous medical waste handlers and to protect them from exposure to potentially hazardous substances (Bizuneh et al., 2024). Nurses' attitudes toward medical waste management are crucial determinants of their practices and compliance with established protocols. Positive attitudes can lead to better waste segregation, proper disposal techniques, and active participation in medical waste management training programs. Conversely, negative attitudes may result in poor waste handling practices, increased risks of infection, and environmental hazards. Understanding the factors that shape nurses' attitudes is, therefore, essential for designing effective interventions to improve medical waste management practices in healthcare settings (Deress et al., 2019). Establishing a health care system is an essential requirement of every society. Therefore, the problems arising from medical waste management have received great global attention, and many studies and research have been conducted on these issues (Shivalli & Sanklapur, 2014).

Furthermore, the Ministry of Health and Environment provided instructions and laws for handling hazardous waste in addition to the National Infection Control Manual which gave detailed guidelines to Iraqi health institutions for managing medical waste from its production until it was disposed of (Dalui et al., 2021). For effective management of hospital waste, attitude is a vital requirement for staff of health care institutions to avoid serious health problems within health care institutions as well as outside environment and society (Janjua et al., 2010). Training programs have been shown to improve nurses' attitudes. A study emphasized the need for refresher training to ensure the sustainability and further improvement of nurses' Medical waste management practices (Banstola et al., 2017).

2. Objective of the study

- 1-To assess level of nurses attitudes towards medical waste management
- 2- To find out the relationship between nurses' attitudes and key sociodemographic characteristics such as age, sex, qualifications in nursing, years of experience, attending training courses and department they work in.

3. Methodology

Cross-sectional descriptive research had been used in the present to determine nurses toward medical waste management at Al-Imam Al-Hussein Medical City in Karbala City during the period 30th September 2024 to 15th February 2025. The study collected data by using non-probability "convenience" sample from (318) nurses employed in specific departments of the hospital who satisfied eligibility requirements. A different group of 30 nurses served as participants in the pilot

study then were excluded from the main analysis. There are reliable measures through literature review which served as the basis for this study to accomplish its objectives. This questionnaire includes two parts: Part I: Demographic Characteristics: This part consists of (6) items that include: (Age, sex, educational level, years of experience, participation in training course, department (units)). Part II: nurses' attitude toward medical waste management: The questionnaire includes (14) items. Statistical Analysis: Descriptive Data Analysis and Statistics Frequency (f): In statistics the frequency of an event is the number of times the event occurred in an experiment or study Percentage (%): A percentage is a number or a ratio stated as a fraction of 100 in mathematics. Mean (M) and Standard Deviation: The "mean" in biostatistics refers to the arithmetic average of a set of values. In statistics, the "standard deviation" is a measure of the amount of variation or dispersion of a random variable expected about its mean.

4. results

Table (1): Distribution of nurses according to their Socio-demographic Characteristics

List	Characteristics	f	%	
1	Age (year) M±SD= 28 ± 6	20 – 29	243	76.4
		30 – 39	53	16.7
		40 – 49	17	5.3
		50 – 59	5	1.6
		<i>Total</i>	<i>318</i>	<i>100</i>
2	Sex	Male	133	41.8
		Female	185	58.2
		<i>Total</i>	<i>318</i>	<i>100</i>
3	Qualification in nursing	Preparatory school	30	9.4
		Diploma	125	39.3
		Bachelor	158	49.7
		Master	4	1.3
		Doctorate	1	.3
		<i>Total</i>	<i>318</i>	<i>100</i>
4	Years of experience M±SD= 4.7 ± 5.6	Less than 1	15	4.7
		1 – 5	211	66.4
		6 – 10	57	17.9
		11 – 20	24	7.5
		21 +	11	3.5
5	Participation in training courses	<i>Total</i>	<i>318</i>	<i>100</i>
		No	220	69.2
		1 – 3	90	28.3
		4 – 6	6	1.9
		7 +	2	.6
	<i>Total</i>	<i>318</i>	<i>100</i>	

f: Frequency, %: Percentage, *M*: Mean, *SD*: Standard deviation

Table (1) shows that most of nurses are young fall within age group of 20 – 29 years. The sex of nurses reveals that female nurses are more than male nurses as seen with 58.2% females and 41.8% males. Regarding qualification in nursing, the highest percentage refers to bachelor degree in nursing among 49.7% out of 318 followed by diploma degree among 39.3%.

The years of experience for nurses is reported 66.4% of nurses have 1 – 5 years of experience, expert nurses seen with minor percentages (11 – 20 years, 7.5% and 3.5%). Regarding participation in training courses about medical waste management, 30.8% of nurses reported their participation distributed over various number of courses that is highly frequent with 1 – 3 training courses among 28.3%.

Table (2): Overall Assessment of Nurses' Attitude Strength about Medical Waste Management

Overall Attitude	f	%	M	SD	Ass.
Low	22	6.9	8.29	2.619	Moderate
Moderate	190	59.8			
High	106	33.3			
Total	318	100			

f: Frequency, %: Percentage, M: Mean for total score, SD: Standard Deviation for total score, Ass: Assessment

The findings in Table (2) reveal that the highest percentage of nurses (59.8%) exhibits "Moderate" attitude toward medical waste management. Notably, 33.3% demonstrate "High" attitude strength ($M \pm SD = 8.29 \pm 2.619$). However, the 6.9% nurses reported with a "Low" attitude.

Table (3): Relationships among Level of Nurses' Attitudes toward Medical Waste Management and their Sociodemographic Variables

Variables	Overall knowledge		
	Mean	SD	Relationship
Age (year)	20 – 29	8.38	$r^s = .028$ P-value= .615 Sig= N.S
	30 – 39	7.87	
	40 – 49	8.76	
	50 – 59	7.00	
	Total	8.29	
Sex	Male	8.47	$r^* = .054$ P-value= .340 Sig= N.S
	Female	8.17	
	Total	8.29	
Qualification in nursing	Preparatory school	7.30	$r^s = .167$ P-value= .003 Sig= H.S
	Diploma	7.96	
	Bachelor	8.78	
	Master	7.25	
	Doctorate	7.00	
Total	8.29	2.619	
Years of experience	Less than 1	8.40	$r^s = -.133$ P-value= .017 Sig= S
	1 – 5	8.36	
	6 – 10	8.05	
	11 – 20	8.04	
	21 +	8.64	
Total	8.29	2.619	
Participation in training courses	No	7.79	$r^s = .274$ P-value= .001 Sig= H.S
	1 – 3	9.54	
	4 – 6	8.17	
	7 +	7.50	
Total	8.29	2.619	

Low= 0 – 4.66, Moderate= 4.67– 9.32, High= 9.33 – 14, r^s : Spearman Correlation coefficient, r^* : Biserial correlation coefficient, P: Probability, Sig: Significance, N.S: Not Significant, S: Significant, H.S: High Significant

The Table (3) indicates that age shows no significant relationship with attitudes ($p = 0.615$). Gender also shows no significant relationship ($p = 0.340$). However, qualification in nursing reveals a highly significant relationship ($p = 0.003$), with nurses holding higher qualifications (particularly bachelor's degrees) demonstrating more positive attitudes toward medical waste management. Years of experience show a weak but significant inverse relationship ($r = -0.133$, $p = 0.017$), where nurses with less than one year of experience had slightly more positive attitudes. Participation in training

courses has a strong positive correlation ($r = 0.274$, $p = 0.001$), indicating that nurses who participated in more training sessions exhibited significantly more favorable attitudes toward medical waste managements.

5. Discussion:

Study findings indicated that the greater percentage (76.4%) of nursing staff was within the age group of 20 – 29 years, (16.7%) was in the age group of 30 – 39 years, (5.3%) was in the age group of 40 – 49 years and (1.6%) in the age group of 50 – 59 years, this finding supports (Shivalli & Sanklapur, 2014) who conducted a research study to assess the attitude of nurses staff which found that the most participants are less than 30 years.

The sex of nurses reveals that female nurses are more than male nurses as seen with 58.2% females and 41.8% males this agreement with kalyubia Governorate (2019) who shows that the 91.3% of study samples were female.

According to subjects' educational qualification, the majority (49.7%) of the respondents was holding bachelor in nursing. this agreement with Dalui et al. (2021) who found that most of nurses (78.2%) had nursing bachelor's degree.

More than half of nurses (66.4%) had generally less than five years' experience as a nurse this finding inconsistent with Qadir et al. (2024) It was found that 67.8% of the participants had more than 10 years of work experience and a large part—49.6%—participated in training about biomedical waste management.

Regarding participation in training courses about medical waste management, 30.8% of nurses reported their participation distributed over various number of courses that is highly frequent with 1 – 3 training courses among 28.3%. this result disagrees with Musa et al. (2020) who conducted (71.1%) Participation in training courses has a strong positive correlation indicating that nurses who participated in more training sessions exhibited significantly more favorable attitudes toward medical waste management.

Regarding to nurses' attitudes toward medical waste management vary, with an overall moderate to high assessment this result resembles with study result done by Akkajit et al. (2020) More than 85% of participants were favorable toward medical west management., according to overall assessment of nurse's attitudes toward medical waste management reveal that the highest percentage of nurses (59.8%) exhibits “Moderate” attitude toward medical waste management. Notably, 33.3% demonstrate “High” attitude, and 6.9% nurses reported with a “Low” attitude this result disagree with finding Akkajit et al. (2020) Nurse managers had an overall attitude categorized as high and other occupations had scores of 95.2%, 93.4%, 85.4% and 80.0%. Participation in training courses has a strong positive correlation ($r = 0.274$, $p = 0.001$), indicating that nurses who participated in more training sessions exhibited significantly more favorable attitudes toward medical waste managements this finding agreement with study results done by Mugabi et al. (2018) which show that strong association between training courses and attitudes towards medical waste management.

6. Conclusion:

The assessment of nurses' attitudes toward medical waste management at Al-Imam Al-Hussein Medical City reveals a predominantly moderate to high level of awareness and positive attitudes among nursing staff. Younger nurses and those with higher educational qualifications demonstrated more favorable attitudes, highlighting the influence of training and education on MWM practices. Despite the overall positive outlook, concerns regarding the perceived risks associated with waste segregation indicate a need for further education and training. Implementing regular training programs can enhance nurses' understanding and compliance with established protocols, ultimately improving biomedical waste management practices. This study underscores the essential role of nurses in safeguarding public health through effective waste management strategies.

7. Acknowledgement

We would like to acknowledge the all- nursing staff in AL-Imam Al-Hussein Medical City. So, special thanks provided to all nurses who participate and cooperate in study

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