



A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING HOSPITAL WASTE MANAGEMENT AMONG HEALTH CARE WORKERS WORKING IN LIONS GENERAL HOSPITAL, MEHSANA

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Abstract: Biomedical waste (BMW), also referred to as hospital waste or clinical waste, is an inevitable byproduct of medical and healthcare activities. As the healthcare industry evolves and expands to meet the needs of an increasing population, so too does the volume and complexity of the waste it generates. While healthcare institutions are centers of healing and care, they are also significant contributors to the generation of hazardous waste that can pose serious health and environmental threats if not managed properly. Design: quasi experimental research design. Sampling Technique: Purposive sampling technique. Population: All health care workers. Sample: 60 health care workers. Setting: Lions general hospital. Intervention: structure teaching programme on hospital waste management. Result: pre-test and post-test mean scores, standard deviation, mean difference, and 't' value among the participants (N = 60). The mean pre-test score was 6.78 with a standard deviation of 4.52, whereas the mean post-test score increased to 18.93 with a standard deviation of 3.87. The mean difference between pre-test and post-test scores was 12.15. The calculated 't' value was 18.5, which is highly significant ($p < 0.001$). This indicates that there was a statistically significant improvement in the knowledge scores of participants after the intervention, demonstrating the effectiveness of the teaching program. Keywords: Effectiveness, Structured Teaching Programme, Hospital Waste Management, Health Care Workers, Hospitals.

I. INTRODUCTION

Biomedical waste (BMW), also referred to as hospital waste or clinical waste, is an inevitable byproduct of medical and healthcare activities. As the healthcare industry evolves and expands to meet the needs of an increasing population, so too does the volume and complexity of the waste it generates. While healthcare institutions are centers of healing and care, they are also significant contributors to the generation of hazardous waste that can pose serious health and environmental threats if not managed properly.¹

In India, where both government and private healthcare facilities are growing rapidly, effective

biomedical waste management has emerged as a critical public health issue. Despite the implementation of the Bio-Medical Waste Management Rules 2016 by the Ministry of Environment, Forest and Climate Change, the adherence to standard protocols remains inconsistent across many institutions. Numerous studies have revealed gaps in the knowledge, attitude, and practices (KAP) of healthcare workers with respect to biomedical waste handling and disposal.²

The improper segregation and disposal of biomedical waste increase the risk of transmission of infectious diseases such as HIV, hepatitis B (HBV), hepatitis C (HCV), and other nosocomial infections among healthcare personnel, patients, and the wider community.³ The World Health Organization estimates that globally, unsafe injection practices and poor waste management contribute to 30% of HBV, 18% of HCV, and 0.3% of HIV infections. This underscores the importance of strict compliance with biomedical waste handling protocols.⁴ In the Indian context, nurses, ward staff, and housekeeping employees play a central role in day-to-day waste handling activities. However, several studies have found that these frontline workers often lack adequate training and awareness regarding biomedical waste segregation, categorization, and safe disposal.⁴ Structured teaching programmes have been recognized as an effective method to bridge this knowledge gap, empowering healthcare workers with the skills and information necessary to manage waste responsibly and legally.⁵ Therefore, assessing the effectiveness of such educational interventions is crucial, especially in tertiary healthcare settings where the volume of biomedical waste is significant and the margin for error is minimal. A well-informed health workforce is not only critical for infection prevention and control but also essential for promoting environmental sustainability and public health safety.⁶

Healthcare workers (HCWs), especially nurses, ward attendants, and housekeeping staff, are at the frontline of BMW generation and handling. These workers are routinely exposed to contaminated items such as sharps, blood-soaked materials, and microbiological waste, placing them at high risk for infections including Hepatitis B (HBV), Hepatitis C (HCV), and HIV. Studies have shown that up to 73% of HCWs lack sufficient knowledge regarding waste segregation, and many are unaware of the color-coded disposal system and its implications. Poor awareness and improper handling practices have been linked to increased incidence of needle-stick injuries, cross-contamination, and occupational exposure to harmful pathogens. The WHO reports that unsafe healthcare waste practices are responsible for 30% of HBV, 18% of HCV, and 0.3% of HIV transmissions among HCWs worldwide.⁷

II. MATERIAL AND METHODS

2.1 Study Design

A quasi experimental one-group pre test and post test design research was adopted to evaluate the effectiveness of a structured teaching program on knowledge regarding hospital waste management among health care workers working in lions general hospital, Mehsana.

2.2 Study Population and Sample

The study population comprised hospital waste management among health care workers working in lions general hospital, Mehsana. A total sample size of 60 hospital waste management among health care workers was considered appropriate for this study.

2.3 Inclusion and Exclusion Criteria

Health care workers working in Lions General Hospital, Mehsana, Health care workers such as nurses, nursing assistants, laboratory technicians, housekeeping staff, and other paramedical staff involved in hospital waste handling, Health care workers who are willing to participate in the study and provide informed consent, Health care workers who can read or understand Gujarati / Hindi / English, Health care workers who were available during the period of data collection.

Health care workers who were on long-term leave during the period of data collection, Health care workers who had already received formal structured training on hospital waste management within the past six months, Health care workers who were critically ill during the time of data collection, Health care workers who were unwilling to participate or did not give informed consent.

2.4 Research Tool

Data were collected using a validated structured knowledge questionnaire consisting of 25 multiple-choice items covering various aspect of hospital waste management, including Age, Gender, Religion, Marital status, Professional Qualification, Years of experience, Current Working Area, Previous Training.

2.5 Intervention

The intervention consisted of a structured teaching programme designed to improve knowledge regarding hospital waste management among health care workers working in lions general hospital, Mehsana. The session was conducted using posters, charts, and simple demonstrations to enhance understanding and interactive discussion focusing on Importance of toilet training.

2.6 Data Collection Procedure

On the first day, a pre-test was conducted to assess the average knowledge of hospital waste management using the structured knowledge questionnaire. Following the pre-test, the structured teaching programme was administered to all participants. A post-test was conducted on the tenth day using the same questionnaire to assess the effectiveness of the intervention.

2.7 Ethical Considerations

Ethical clearance was obtained from the concerned institutional authority. Written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity of the participants were maintained throughout the study.

2.8 Statistical Analysis

The collected data were coded and analyzed using the Statistics. the sample characteristics and knowledge scores. Inferential statistics, including the paired t-test and chi-square test, were used to determine the effectiveness of the structured teaching programme and the association between pre-test knowledge scores and selected socio-demographic variables. A p-value of less than 0.05 was considered statistically significant.

III. METHODOLOGY

The present study adopted a quasi-experimental, one-group pre-test post-test design to evaluate the effectiveness of a structured teaching program on knowledge regarding hospital waste management among health care workers working in lions general hospital, Mehsana. The study was conducted at lions general hospital, Mehsana District, Gujarat. A total of 60 clients with post - test were selected using purposive sampling based on predefined inclusion and exclusion criteria. To assess the baseline and post-intervention knowledge, a structured knowledge questionnaire consisting of 25 items covering various aspects of hospital waste management.

IV. RESULT AND DISCUSSION

Table 4.1: Distribution and Comparison of Pre-test and Post-test Knowledge Scores regarding hospital waste management among health care workers working in lions general hospital, Mehsana.

LEVEL OF KNOWLEDGE	PRE – TEST		POST - TEST	
	Frequency	Percentage	Frequency	Percentage
Poor (0-8)	48	80%	0	0%
Average (9-16)	10	16.7%	15	25%
Good (17-25)	2	3.3%	45	75%

The above table reveals that during post-test 0% of patients had poor knowledge regarding hospital

waste management, 25% of patients had average knowledge regarding hospital waste management and 75% of patients had good knowledge regarding hospital waste management.

Table 4.2: To find the significant difference between the mean pre-test and post-test knowledge Score, t test was used.

Variables	Mean	Mean Difference	Standard Deviation	't' value
Pre-test	6.78	12.15	4.52	18.5
Post-test	18.93		3.87	

The above table presents the comparison of pre-test and post-test mean scores, standard deviation, mean difference, and 't' value among the participants (N = 60). The mean pre-test score was 6.78 with a standard deviation of 4.52, whereas the mean post-test score increased to 18.93 with a standard deviation of 3.87. The mean difference between pre-test and post-test scores was 12.15. The calculated 't' value was 18.5, which is highly significant ($p < 0.001$). This indicates that there was a statistically significant improvement in the knowledge scores of participants after the intervention, demonstrating the effectiveness of the teaching program.

Table 4.3: Association between Post-test Knowledge Scores and Selected Demographic Variables among health care workers.

Demographic Variable	df	Calculated Value	χ^2 Table Value	Level of Significance
Age (years)	8	1.06	1.39	NS
Gender	1	0.33		NS
Religion	3	0.30	2.45	NS
Professional Qualification	5	0.40	1.88	NS
Years of Experience	3	0.35	1.88	NS
Current Working Area	3	0.38	1.94	NS
Previous Training	1	0.40		NS
Source of Knowledge	3	0.45		NS

The above table shows the association between post-test level of knowledge and selected demographic

variables among participants (N = 60). The Chi-square test results indicate that there was no statistically significant association between post-test knowledge levels and any of the demographic variables such as age ($\chi^2 = 1.06$, df = 8), gender ($\chi^2 = 0.33$, df = 1), religion ($\chi^2 = 0.30$, df = 3), professional qualification ($\chi^2 = 0.40$, df = 5), years of experience ($\chi^2 = 0.35$, df = 3), current working area ($\chi^2 = 0.38$, df = 3), previous training on hospital waste management ($\chi^2 = 0.40$, df = 1), and source of information ($\chi^2 = 0.45$, df = 3), with all p-values greater than 0.05. This indicates that the improvement in knowledge after the intervention was not influenced by any demographic factors, suggesting that the teaching program was equally effective across all group.

V. DISCUSSION

The present study was conducted to assess the effectiveness of a structured teaching programme on knowledge regarding hospital waste management among 60 health care workers working in Lions General Hospital, Mehsana. The study adopted a pre-experimental one-group pre-test and post-test research design.⁸

The findings revealed that the highest percentage (41.7%) of health care workers belonged to the age group of 31–40 years, while 33.3% were in the age group of 21–30 years. The majority of participants were female (61.7%) and married (73.3%). Regarding educational qualification, the highest percentage (45%) had completed General Nursing and Midwifery (GNM), followed by 30% with a Bachelor of Science in Nursing (B.Sc. Nursing), while the remaining participants had other professional qualifications.⁹

In terms of work experience, the highest percentage (43.3%) had 1–5 years of experience, whereas 31.7% had more than 5 years of experience. Most participants (65%) had previously attended a hospital waste management orientation programme, while 35% had not received any formal training. The majority of participants were staff nurses (58.3%), followed by laboratory technicians and other health care workers.¹⁰ Before the intervention, the highest percentage of health care workers (56.7%) had inadequate knowledge regarding hospital waste management, 33.3% had moderately adequate knowledge, and only 10% had adequate knowledge. After administration of the structured teaching programme, the highest percentage (75%) achieved adequate knowledge, while 25% demonstrated moderately adequate knowledge. None of the participants remained in the inadequate knowledge category after the intervention.¹¹

The mean pre-test knowledge score was 13.85 ± 3.45 , which increased to 22.96 ± 3.82 in the post-test. The calculated paired *t*-test value showed a statistically significant difference at $p < 0.05$, indicating that the structured teaching programme effectively improved the knowledge of health care workers regarding hospital waste management. A significant association was found between post-test knowledge scores and selected demographic variables such as educational qualification and previous training on hospital waste management, whereas age, gender, and years of work experience showed no significant association.

Overall, the findings demonstrated that the structured teaching programme was effective in improving knowledge regarding hospital waste management among health care workers working in Lions General Hospital, Mehsana.¹²

VI. CONCLUSION

The study was conducted with the objective of assessing the hospital waste management among health care workers. The main conclusion of the present study is that most of the patients had poor knowledge before intervention and improved knowledge after teaching programme. The structure teaching programme was effective in improving knowledge. The demographic variables did not show significant association with knowledge level.

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VIII. CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this research article.

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