



Risk Perception of Healthcare Workers Regarding Polymer Medical Waste Management

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ABSTRACT

Despite the relatively small amounts produced, medical waste is a significant issue for the government and the healthcare industry primarily because it poses threats to persons and the environment. Healthcare wastes pose threats to the environment and public health, but knowledge of these concerns and how they relate to management techniques is still lacking. Evaluating waste management practices and healthcare staff expertise is critical to identify shortcomings and lower risk levels. The study was conducted at three selected private hospitals. These three hospitals contain 462 beds, all together with 184 healthcare workers. The study was designed as a descriptive cross-sectional study, and three private healthcare institutions in the study region were evaluated. These 100 healthcare workers were chosen by purposive sampling. The hospitals under consideration include general surgical, Gynecological, pediatric, and various specialty treatments. Data was gathered for the study utilizing a quantitative questionnaire, which includes closed-ended structured questionnaires. The results showed that most healthcare workers practice waste segregation at source. Chemical cross-linking was very poor. However, waste shredding technology is being used substantially. Risk perception among Healthcare workers regarding polymer help waste management showed more of average to high risk. The study concluded that despite the existence of policies and plans, execution is still subpar at private healthcare institutions. The creation of guidelines for hospital waste management, their distribution to other institutions, and their encouragement to do a critical self-evaluation should all be required by the government.

INTRODUCTION

Polymers are substances connected with energy-intensive manufacturing processes, along with environmental deterioration and severe loss of precious resources due to excessive waste generation (Evide et al. 2021). Furthermore, polymer items are extremely susceptible to rapidly shifting environmental conditions. Globally, the consumption and production of all forms of polymers have been increasing at a virtually consistent rate of roughly 6-7% each year (Balla et al. 2021). In India, main polymers such as plastics, rubber, and so on account for barely 4-5% of world consumption. According to a study, the plastic sector has risen at an annual growth rate of 10% in volume terms, with 8.33 million metric tonnes per year (Jaiswal & Mishra 2019).

Despite the relatively small amounts produced, medical waste is a significant issue for the government and the healthcare industry, primarily because it poses threats to persons and the environment (Wei et al. 2021). Previous research has demonstrated that medical waste is poorly

managed in impoverished countries, and India is no different. Some have researched the related dangers, but few have looked into risk awareness among healthcare workers, especially in this setting (Ferreira & Teixeira 2010).

Healthcare wastes may be harmful because they include infectious agents, poisonous or hazardous chemicals or medications, sharps, teratogenic or radioactive, among other things. Most incidents recorded in the literature have been linked to infectious medical wastes, especially sharps (Prem Ananth et al. 2010). The design and execution of waste management techniques decrease health and environmental concerns, according to several studies undertaken in various situations to evaluate healthcare waste management methods. There have also been reports of persistent shortcomings in handling medical waste (Azouz et al. 2019).

A committed waste leadership team, effective administration, careful planning, excellent organization, supporting legislation, sufficient funding, and complete

employee engagement are all necessary to manage polymer waste in a hospital (WHO 2019). Healthcare wastes pose threats to the environment and public health, but knowledge of these concerns and how they relate to management techniques is still lacking (Kenny & Priyadarshini 2021). Evaluating waste management practices and healthcare staff expertise is critical to identify shortcomings and lower risk levels. The objective of the study includes identifying the practices among healthcare workers regarding polymer health waste management, and identifying the risk perception among healthcare workers regarding polymer health waste management

MATERIALS AND METHODS

A study was conducted at three selected private hospitals. These three hospitals contain 462 beds, all together with 184 healthcare workers. The study was designed as a descriptive cross-sectional study, and three private healthcare institutions in the study region were evaluated. These 100 healthcare workers were chosen by purposive sampling. The hospitals under consideration include general, surgical, gynecological, pediatric, and specialty treatments. Data was gathered for the study utilizing quantitative questionnaires, including closed-ended structured questionnaires. It contains three parts. The questionnaire's first component evaluated Socio-demographic characteristics, while the second part evaluated the practices for handling polymer-based medical waste. The third part was risk perception, measured by a 10-point Likert scale and evaluated the risk grading as low, average, and high.

RESULTS

Section 1: Socio-Demographic Characteristics

Table 1 shows the social demographic variables of the

Table 1: Socio-demographic characteristics.

Characteristics	N	Frequency
Type of Area		
Medical	28	28%
Surgical	22	22%
Obstetrics and Gyane	11	11%
Pediatric	9	9%
OT	12	12%
Laboratory	7	7%
Radiology	6	6%
Others	5	5%
Know the waste management policy		
Yes	44	44%
No	56	56%
Got training regarding waste management		
Yes	82	82%
No	18	18%

participants. 28% of them belong to the medical area, 22% belong to the surgical area, 11% belong to the obstetrics and gynecological area, 9% belong to the pediatric area, 12% belong to the operation theatre area, 7% belong to laboratory area, 6% belongs to radiology area whereas other were 5%.

44% of them knew the waste management policy, and 56%, that is, the majority, were unaware of it. 82% have already received training regarding waste management, whereas only 18% did not get any training.

Section II: Practices Regarding Polymer Waste Management

Table 2 describes the practices regarding polymer waste management among healthcare workers. 68% of the healthcare workers practice waste segregation at source, 22% are not practicing, whereas 10% do it sometimes. Chemical cross-linking was very poor, as 72% were not practicing. Rather, only 28% were practicing. Regarding waste shredding Technology, only 69% were used, whereas 31% were not used. 94% claimed to be using incinerators, whereas only 6% were not using them. 88% practiced burning and landfills, whereas 12% did not use them. 92% said they disinfected the sharps before disposal, whereas 8% did not.

Section III: Risk Perception Among Healthcare Workers Regarding Polymer Health Waste Management

Fig. 1 represents the risk perception among healthcare workers regarding polymer help waste management. 28% showed low risk, 58% were on average risk, whereas 16% represented high risk

DISCUSSION

This study evaluated private hospitals' procedures for managing healthcare waste. It was found that the hospitals

Table 2: Practices regarding polymer waste management.

Characteristics	N	Frequency
Waste segregation at the source		
Yes	68	68%
No	22	22%
Sometimes	10	10%
Practicing Chemical cross Linking		
Yes	28	28%
No	72	72%
Practicing waste shredding technology		
Yes	69	69%
No	31	31%
Incinerator		
Yes	94	94%
No	6	6%
Burying and Landfills		
Yes	88	88%
No	12	12%
Disinfection of sharps before disposal		
Yes	92	92%
No	8	8%

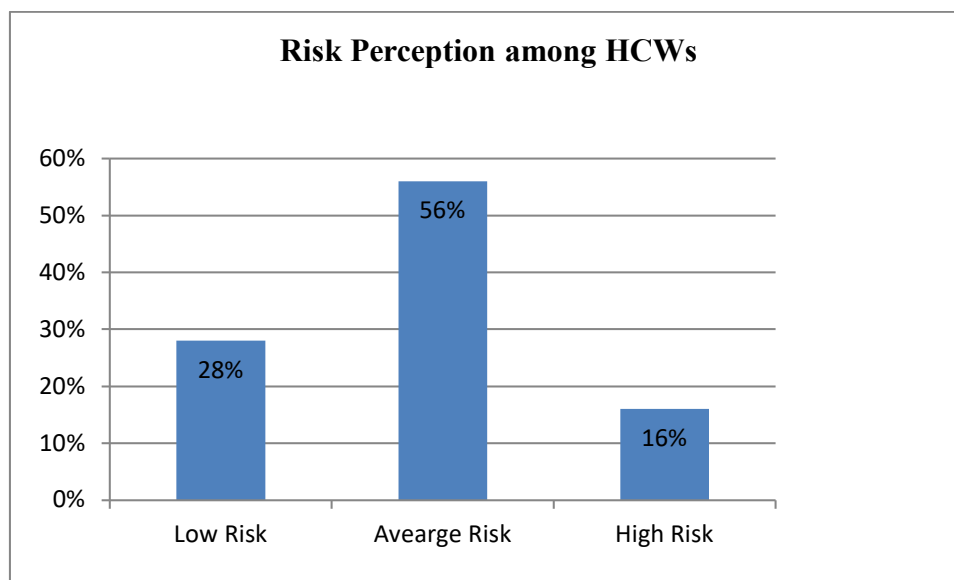


Fig. 1: Risk Perception among healthcare workers.

had well-framed waste management policies, but 56% were unaware of that. Healthcare workers are the main task force dealing with health waste management, and it has been observed that more than 50% were unaware of the policy. Most of them practice waste-shredding Technology, whereas chemical cross-linking is the rarest. To minimize the volume of hospital trash and render it unidentifiable, waste-shredding techniques have previously been integrated with other waste treatment practices such as autoclaves, microwaves, and chemical treatment techniques (Mukhtar et al. 2018).

However, the shredding and compression techniques may be integrated with landfill and incinerator technologies in the chemical cross-linking approach because the shredding technique alone does not fulfill the objective of preventing hospital polymer waste recycling. A crucial component of effective waste management is separating trash at the source. However, maximum (68%) said they separated garbage at the source, which is substantially greater than the results described by Oli et al. where according to the study, 37 (12.3%) and 66 (21.4%) of the survey participants who

worked in government and private hospitals, respectively, consistently separated trash at the site of creation (Oli et al. 2016) The majority of respondents believed they were at risk, 58% were on average risk whereas 16% were representing high risk. Only a few people adopted protective measures. This discrepancy between risk perception and personal safety may be due to a lack of knowledge, personal protective equipment, and even the hazards of polymer waste (Koelmans et al. 2017). Such an assessment's results will help respond to the current public worry in a balanced way and allow policymakers to take measures for scientifically sound reasons.

CONCLUSION

According to the study, adequate resources are often available for waste segregation at the point of creation. However, healthcare employees do not follow safety regulations, and there is no awareness of waste management policy. Despite the existence of policies and plans, execution is still subpar at private healthcare institutions. Most individuals are very aware of the dangers involved with managing polymer health waste, yet risk perception is relatively poor. The creation of guidelines for hospital waste management, their distribution to other institutions, and their encouragement to do a critical self-evaluation should all be required by the government. These concepts can be further developed toward technical guidance documents, and then actual risk assessments for plastic debris of all sizes will be within reach. The results of such an assessment will inform policymakers and reduce the present ignorance and uncertainty about ecological and human health risks.

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