

Investigating Healthcare Waste Regulation: Employees' Knowledge, Perceptions and Practices with Regard to Recycling

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Abstract

Health care waste (HCW) management is critical because of the possible environmental and public health threats it poses. The major goal of this study was to evaluate HCW management procedures in Karachi, the metropolis of Sindh province in southern Pakistan. Thirty government and private hospitals were involved in the project.

Males and nurses were far more likely than Female and physicians to react. In general, people have a limited understanding of trash management and recycling practises. This could be because clinicians' and hospital personnel' views are influenced by factors other than their knowledge, such as long working hours and a hectic environment, which make recycling more difficult. Positive attitudes were found to be weak predictors of hospital waste management and advance education training.

In underdeveloped nations, more education and training on medical waste management should be encouraged. The introduction of new technology in hospital waste management, notably the recycling of hospital household trash, may alter the future outlook for hospital waste disposal in both developed and developing countries. More research on training hospital employees about waste management, particularly about hospital waste recycling and its relative safety, should be promoted.

Keywords: Medical waste, Health care waste, Hospital household recycling, Healthcare workers, Waste management.

Introduction

Over the last few years, healthcare waste has become a significant concern around the world [1]. HCW is defined as all sorts of waste produced by healthcare establishments (HCEs), including infectious and non-infectious waste, chemicals, and hazardous and non-hazardous materials [2]. HCW poses a severe concern to developing countries because of its ability to harm the environment and public health. The lack of awareness among health professionals and the general public about improper HCW handling, the lack of an effective regulatory framework and national policy, and financial constraints are the major impediments to effective healthcare waste management (HCWM), all of which increase the risk of environmental and public health hazards.

About 85% of the waste generated by healthcare activities is non-hazardous, whereas the remaining 15% is classified as hazardous materials, which could be infectious, poisonous, or radioactive [3]. According to a research, only 10 to 25% of hospital trash is infectious or harmful. The volume of such hazardous trash is fairly little, and it was not effectively handled [4]. When combined with home solid trash, the overall waste stream becomes dangerous. Many clinical wastes (e.g., syringes,

needles, saline drips, abandoned food, gauze, vials, and ampoules) are gathered by women and children who resell them despite the dangers to their health.

If not appropriately managed or disposed of, this small amount of HCW may pose different environmental and health hazards. A variety of technologies have been developed so far for the treatment and disposal of HCW. However, determining an acceptable waste treatment method for the chosen site remains a difficult problem for planners and decision-makers, particularly in developing nations. A lot of things have a role in this. Quantification and classification of local trash, degrees of safety, technological applicability, and cost and environmental impact are among them.

Incineration, microwaving, autoclaving, hydropulping, and compaction are all alternatives for HCW treatment. Incineration is an excellent solution for all forms of hazardous and non-hazardous waste. The temperature of combustion exceeds 1800°F [5]. All harmful and toxic substances can be successfully destroyed. The process decreases waste volume by up to 95% of its original volume [6, 7], which is the largest reduction rate of all the methods. However, incineration has a high initial investment cost and may produce pollutants. Microwaving, on the other hand, has a lower environmental impact than incineration because there are no combustion emissions produced by the system. It is capable of reducing waste volume by up to 80%. Microwaving pathological waste is not recommended and necessitates a careful monitoring system [6, 8]. Tudor T et al. advised that recycling and other sustainable activities should be better integrated into the organization's focus, policies, and practises; if high recycling rates and low waste generation rates are to be attained [9].

Material and Method

The research was carried out in 30 different hospitals during the period of February 2022 to March 2022. The data for this study came from two questionnaire surveys: one to collect demographic information about hospital healthcare workers, and the other, the main questionnaire, to examine hospital workers' levels of awareness and attitudes toward HCW management and hospital waste recycling. To extract their knowledge, nurses, hospital management, doctors, Physicians, and cleaners were asked a series of particular questions. To acquire the desired results, data was tabulated and analysed in terms of percentages using MS Excel version 2010 and inferences were drawn from the results. A variety of graphs, such as bar charts, were also employed to clearly concentrate the situation.

Results

The study covered thirty (30) hospitals of different types, in which 20% of the hospitals were public and 80% were private. Out of the 198 respondents, 61% were male (n=120) and 39% were female (n=78). Among male and female respondents 1.52% waste team staff (n=3), 27.27% and 37.87% were physician (n=54) and nurses (n=75), 6.06% were paramedics (n=12), 6.06% were pharmacist (n=12) and 21.22% were related to others departments of the hospitals (n=42). (Table: 1).

The respondents in the age category 31-40 years were the most numerous, accounting for 46.96 % (n=93) of all respondents in their age group. The second most responder group age was 20 – 30 years which account for 42.42% (n=84). Less than 20 years and above 40 years age group respondents were 1.52% (n=3) and 9.1% (n=18). The majority of the responders had a university or postgraduate degree. Almost half of the respondent 51.51% (n=102) have a university education, while 45.45% (n=90) have postgraduate degree. Only 1.52% (n=3) respondents having high school or less than

high school education (Table: 1).

The most respondents were those who had been employed for less than ten years. 65.15% of respondents (n=129) have fewer than 10 years of experience. Responders with employment spans ranging from 11 to 20 years were 24.24% (n=48) and very fewer responses were received from those which had employment period of 21 to 30 years, 10.61% (n=21) (Table: 1).

Table: 1. Demographic and Social Profiles of Respondents

Variables	Categories	Respondents	Percentage
Gender	Male	120	61%
	Female	78	39%
Age	<20	3	67%
	21-30 Years	84	23%
	31-40 Years	93	6%
	41-50 Years	18	4%
Educational Details	< High school	3	1.52%
	High School	3	1.52%
	University degree	102	51.51%
	Post Graduate Degree	90	45.45%
Employment Duration	< 10 years	129	65.15%
	11 – 20 years	48	24.24%
	21 – 30 years	21	10.61%
Occupation	Nurses	75	37.87%
	Physician	54	27.27%
	Pharmacist	12	6.06%
	Paramedics	12	6.06%
	Waste team staff	3	1.52%
	Others	42	21.22%

The response rates were not significantly different between individuals who received basic in-house waste management training 78.79% (n= 104) and those who did not. Only few respondents were trained by short course 13.64% (n=18) and via degree programme 7.57% (n=10) (Figure: 1).

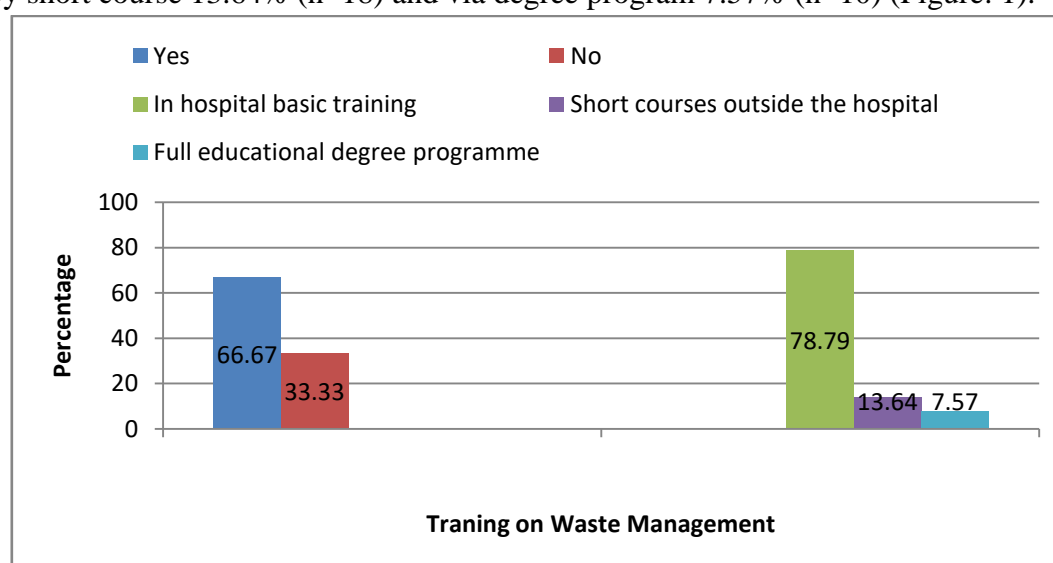


Figure: 1. Waste management training and types of the training.

The respondents showed considerable discrepancies amongst those who had worked for varying lengths of time. Those who had been employed for less than 10 years had the most knowledge, followed by those who had been engaged for 11 to 20 years. Respondents between the ages of 21 and 30 did not display any good expertise (Figure: 2).

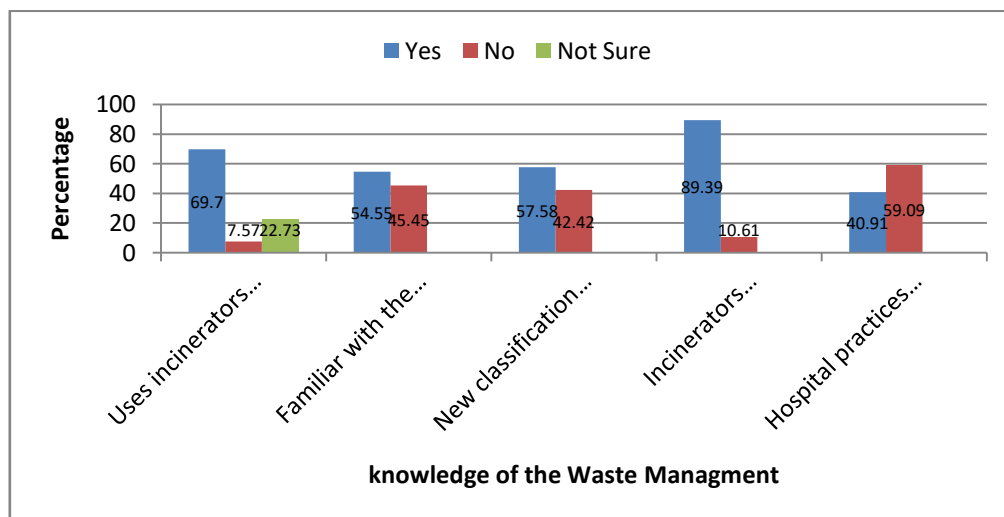


Figure: 2. Respondent knowledge and practices of the waste management.

When compared to those who do not support a system to reduce the risk of harmful substances during waste management, respondents showed 53.03% favourable sentiments. 45.46% respondent showed recycling is a better approach to manage the hospital waste. 42.42% respondents were bothered about the contamination of recycle hospital waste. The respondent (37.88%) were agreed to implement and adopt a comprehensive recycling policies and 56.06% respondent indicated that improving the recycling policies could be cost effective for the hospital (Figure: 3).

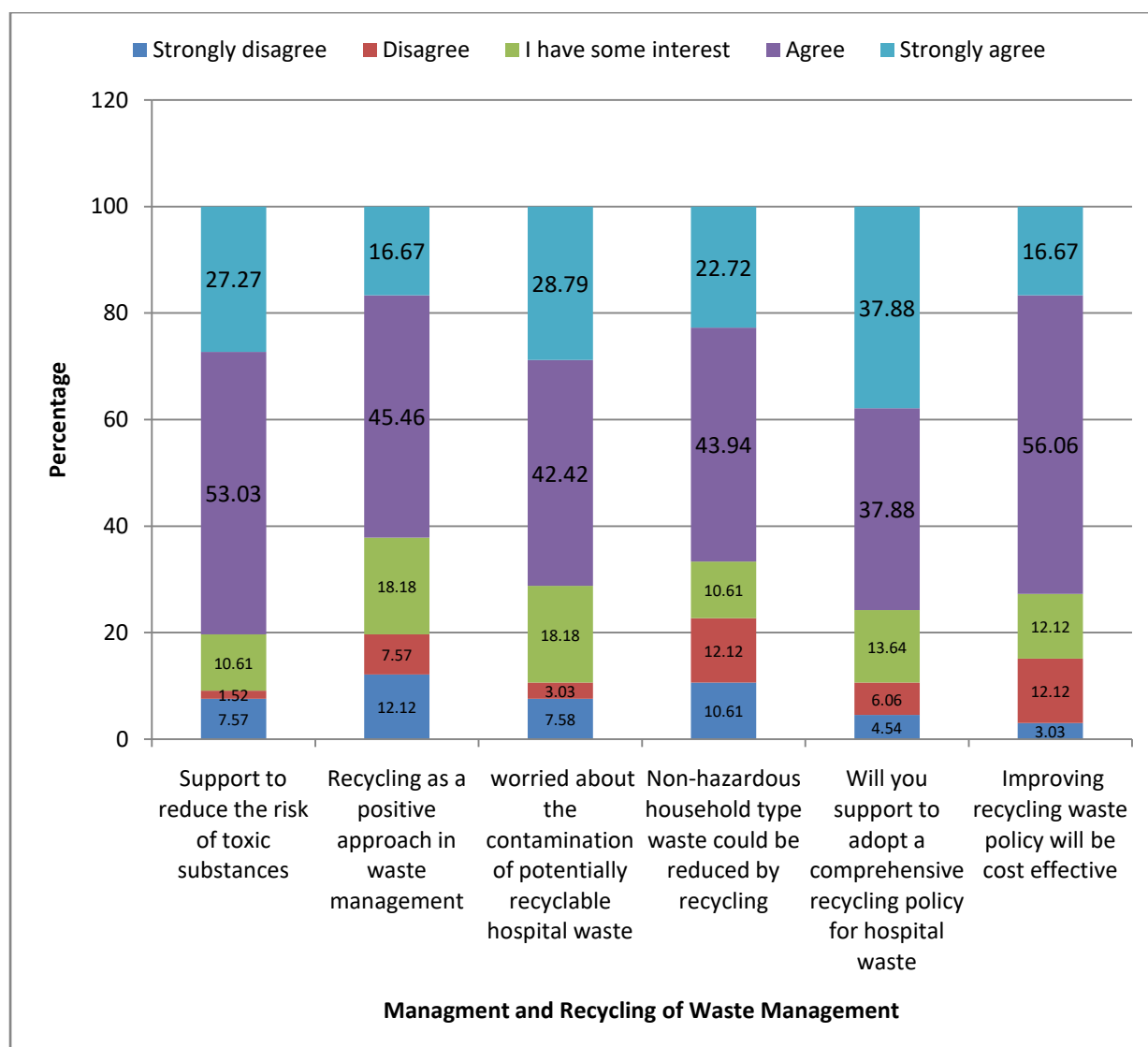


Figure: 3. Respondent Attitudes towards sustainable waste management.

Discussion

Despite its potential environmental and public health problems, HCW management has received little attention recently. HCW is contagious and dangerous. So poses major risks to the environment and human health, and it necessitates special care and management before being disposed of. With an ever-increasing number of hospitals, clinics, and diagnostic laboratories in Karachi, the problem is getting worse. However, there has been relatively little research on this crucial subject, and there is a severe lack of information for planning. Although the rate of dangerous and infectious HCW creation appears to be minimal, its environmental relevance is substantially greater. For HCW source separation, the HCWM is quite satisfactory when using colour coding.

The failure to create good practise for the disposal and recycling of HCW appears to be due to a lack of information, trainings, experiences, and health-care policies and programmes. The lack of such a policy that governs HCW disposal, as well as the lack of an auditing mechanism that supervises the waste collecting and disposal procedure, demonstrates that hospital management is devoid of order and good practise.

HCW recycling evaluation entails more than just calculating the amount of garbage recycled. It also includes other crucial issues such as the hospital's policy on HCW management and recycling. Another important factor to consider when analysing HCW recycling is segregation. Safety is also crucial, and it is an element that should not be overlooked while analysing HCW recycling. The recycling process and how it is carried out, as well as how much and what is recycled, are all pillars in the evaluation of recycling. For good control of the hazards related with the HCW, a number of hospital policy instruments covering HCW management exist. Command-and-control instruments, economic or market-based instruments, voluntary agreements, and information-based methods are some of these policies [10]. According to Ball J., (2006), "Waste management in underdeveloped nations is characterised by a widespread lack of resources and reliable operational systems". This results in sub-optimal or poor waste management in hospitals. Ball J. (2006) identified 7 major elements affecting hospital policy making, political will, and lack of resources, which are priority standing, local factors, systems and information, unsatisfactory waste management methods, and donor money, based on personal experience [11].

Conclusion

Hospital waste recycling could have a substantial impact on overall waste management systems and how hospital waste is separated and disposed. The involvement of hospital employees is critical in enhancing recycling performance; yet, hospital workers' attitudes about hospital waste recycling are still unclear, and research in this area is lacking. The factors that influence recycling behaviour are little reported in the medical literature, and there has been little research on disparities in hospital staff' opinions of recycling in developing and wealthy nations. The findings pave the way for more research into the elements that influence recycling attitudes, as well as encouraging hospitals in developing nations to start recycling and provide the necessary infrastructure.

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