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HOSPITAL WASTE MANAGEMENT: A MINI REVIEW

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ABSTRACT

Various types of hazardous wastes may be generated as a result of health-care operations. Mismanagement of these wastes may put the environment and workers' health at jeopardy. When it comes to the proper management of hospital wastes, developing nations are limited by resources. The major problems in hospital waste management in developing nations are summarized in this research. According to a study of the literature, rules and legislation focused on hospital waste management are relatively new in many of these nations. The way these regulations are implemented differs from one hospital to the next. Furthermore, trash production rates vary greatly both inside and between these nations. This is mostly due to a lack of consensus among academics on terminology and methods for measuring such wastes. Furthermore, inadequate waste segregation, collection, storage, transportation, and disposal procedures plague hospitals in many nations, posing occupational and environmental hazards. In the lack of training for hospital personnel, knowledge and awareness of appropriate waste management remain low. Furthermore, sanitary personnel and scavengers working in hospitals are not provided with safety equipment or vaccination. Illegal recycling of non-segregated trash poses additional safety concerns. In general, medical waste management in poor nations is fraught with difficulties. Sustainable waste management techniques may help to mitigate the negative consequences of hospital waste.

KEYWORDS: *Infectious waste, Clinical Waste, Medical Waste, Waste Generation, Sustainable Development.*

INTRODUCTION

Today, there is a rising recognition throughout the globe that trash is a resource that should not be discarded and dumped in landfills. Studies on trash treatment and recycling methods and processes abound in the literature. However, certain wastes are deemed too dangerous to be recycled or reused without first being pre-treated. One kind of trash is infectious healthcare waste. According to the World Health Organization (WHO), about 75 percent to 90 percent of waste produced in healthcare institutions is non-hazardous; nevertheless, the remaining 10–25 percent cannot be overlooked. This may include things that are contagious, radioactive, poisonous, or genotoxic. These waste materials are hazardous to the environment and to workers' health[1]. Due to a rise in population, the number of healthcare facilities, and the usage of disposable medical goods, the production of hospital trash has grown considerably in recent years. Many industrialized nations have stringent regulations in place for the segregation,

storage, and transportation of medical waste[2]. When it comes to efficient hospital waste management (HWM), developing nations are reported to be resource limited.

Hospital waste management is a critical activity that must be handled carefully. Hazardous waste management requires specialized knowledge and laws, and it must be carried out by experts in the area[3].Large amounts of trash are transported to dumpsites. Waste from wealthy countries, on the other hand, is mostly disposed of in developing countries. Untreated residents pay a financial price for garbage on the sides of the road and on empty areas. It also pollutes the environment in the area. Hazard. Pollution levels are growing, causing changes in the ecosystem and increasing the cost of garbage in terms of health concerns, as well as having a negative impact on infrastructure. Authorities' perspectives have changed on it[4].

Despite being a relatively new problem, waste management has attracted the attention of governments all over the globe. Management of waste nowadays refers to the collecting, sorting, processing, recycling, and reuse of things that would otherwise be thrown away[5]. This article examines strategies for managing medical waste using five case study hospitals as examples.The Waste Management Rules 2005, which were adopted under the Pakistani government's Environment Protection Act, established the criteria (1997). Until recently, medical waste management was not considered a concern. In the 1980s and 1990s, concerns about human immunodeficiency virus (HIV) and hepatitis B virus (HBV) infection spurred investigations into the hazards of medical waste. Hospital waste generation has become a major concern due to its many consequences as a risk factor for the health of patients, hospital staff, and the general public[6].

Hospital waste management refers to the treatment of garbage generated by hospitals with the goal of preventing disease transmission. Hospital waste management, including segregation, collection, storage, transportation, and disposal, is not well understood in poor nations. According to studies, approximately 2.0 kilogramme of trash is generated per bed every day in Pakistan, with 0.1-0.5 kg classified as hazardous waste[7].Hospital waste management is a significant issue in the majority of nations. With the introduction of reusable needles, syringes, and other similar products in recent years, medical waste disposal has become even more problematic. Hospital wastes are divided into various groups based on their weight density and contents. Medical waste is divided into five categories by the World Health Organization: contagious, sharp objects, pathology, pharmacological, and radioactivity[8].

Human tissues and body parts, animal corpses, syringes, knives, saws, medicines, vomits, urine, chemicals, and laboratory fluid are all examples of infectious waste. HIV/AIDS, hepatitis B, and C virus infections are all caused by infectious health-care waste. Injuries from needles and sharp items contaminated with human blood are the most common way for these viruses to spread[9].Human tissues and body parts, animal corpses, syringes, knives, saws, medicines, vomits, urine, chemicals, and laboratory fluid are just a few examples of infectious waste. Infectious health-care waste is a leading source of HIV/AIDS, hepatitis B, and C[10]. Injuries from needles and sharp items contaminated with human blood are the most common routes of transmission for these viruses. The degree of sensitization of health managers and other professionals, as well as existing local laws and available resources, all influence healthcare waste management in any nation. Despite the presence of the Pakistan Biosafety Rules 2005, neither adequate hospital waste management systems nor the relevant health experts and managers are aware of the severity of the problem that has resulted. The entire amount of trash produced by health institutions is typically disposed of alongside municipal rubbish or burnt

outside, posing environmental risks. The aspect of waste segregation followed by suitable disposal techniques for different parts of the trash is virtually non-existent, and waste storage before disposal is typically open.

According to studies in Pakistan, about 2.0 kg of trash is generated per bed each day, of which 0.1-0.5 kg is classified as hazardous waste. Various health outlets create about 4 to 2,000 Kg of trash each day, of which 75 percent to 90 percent is non-risk waste produced by health care premises, housekeeping, and administrative activities, and only 10-25 percent is infectious and requires more cautious disposal. Furthermore, failing to properly dispose of spent syringes, blades, and other medical devices results in their reuse, increasing the risk of disease transmission. In Pakistan, landfills and incinerator are the most common ways for disposing of medical waste. Hospital trash is buried underground in the landfill technique, but according to health specialists, not a single landfill is built on scientific lines. When clinic waste is burned, toxic gases like dioxin and chemicals are released into the air, which can be a potential carcinogen. Crematoriums installed in various locations also lack proper filters and scrubbers, and when clinic waste is burned, toxic gases like dioxin and chemicals are released into the air, which can be a potential carcinogen. Only a few hospitals have incinerators that are up to code. Medical trash should be separated from solid garbage and kept in specific containers, according to health experts. Proper landfills should be built, and any landfills without screens or scrubbers should be closed down promptly.

MATERIALS AND METHODS

At July 2010, a cross-sectional research was performed in five hospitals in Lahore: Children's hospital, Sheikh Sayed hospital, Shakta Khanum hospital, Main Mushy hospital, and Shalamar hospital. This research is based on an assessment of existing medical waste information, including its nature, effects, and management methods. Considering the infrastructure requirements for hospital waste management as well as compliance with Pakistan's HWM Rules 2005. For all 5 hospitals, storage and segregation methods at the ward/department level, internal and external transportation, and on-site ultimate disposal / off-site disposal were investigated. A literature study and an internet search were used to gather information. Following a thorough review of the literature, a questionnaire was created to gather information on the disposal of biological waste produced in hospitals. The hospitals were visited, and the institutions' administrations were questioned, in order to get a thorough understanding of their waste management policies & staff training. They were informed about the research and verbal permission was acquired. The estimate of simple percentage was the statistical method utilized to analyze the obtained data.

OBSERVATIONS AND RESULTS

Convenient sampling was used to perform a cross-sectional research at five teaching hospitals in Lahore. Hospitals from both the public and private sectors were included in the study. The existence or lack of waste management techniques was observed in the hospitals. The administrators of the institutions were interviewed in order to get a better understanding of their waste management policies and staff training. Percentages were used to evaluate the data gathered from the questionnaire. Figure 1 depicts the many kinds of waste generated in hospitals, including radioactive waste. This demonstrated the need of appropriate waste disposal in all hospitals.

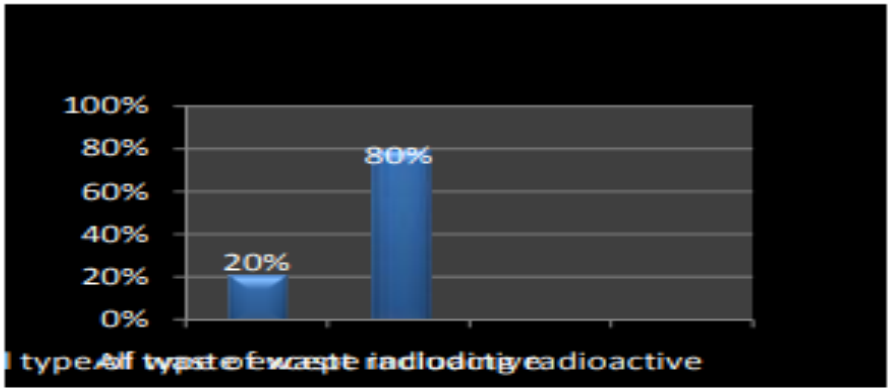

Figure 1. **Type of waste material in hospital**

Figure 1 illustrates the many kinds of waste generated in hospitals, including radioactive waste. As a result, all hospitals must have appropriate waste disposal.

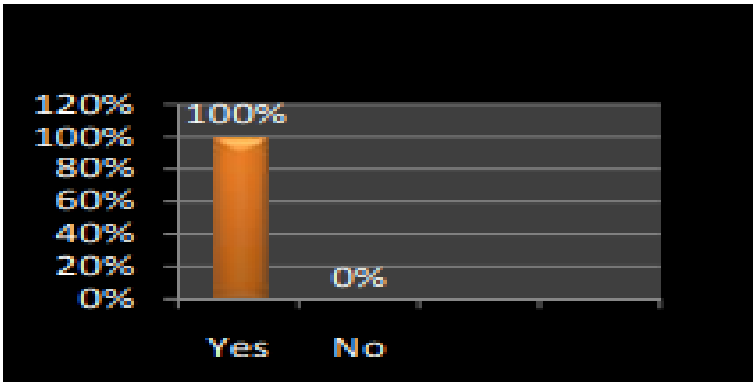

Figure 2. Is there segregation of waste?

In ordinary medical practice in poor nations, such as Pakistan, overuse of injections is prevalent. The person in charge must cut or break any disposal medical equipment and supplies, such as syringes, needles, plastic bottles, drips, and infusion bags, and make them non-reusable at the point of use. In 60% of hospital, a needle cutter is utilized.

CONCLUSION

Pharmaceutical waste must be properly collected and separated. Medical waste management methods and their effect on public health and the environment are not well understood. Medical waste removal and management are also insufficiently practiced. However, there is a need to raise awareness about medical waste and the problems that surround it. An in-depth examination of current waste management methods in public and private hospitals. Creating appropriate training programs for hospital employees and health professionals. Hospital waste management initiatives are being monitored and evaluated. The necessity for health-care waste management planning in order to make it easier to put in place the required steps to address the current situation. Pharmacists play an important role in this field. "If we sell it, we're also responsible for collecting and disposing of it," one pharmacist said. Pharmacists' responsibilities include the following. Creating a disposal procedure, potentially in collaboration with associations, manufacturers, and hospital management. Creating a program for the return and disposal of unwanted medications, which involves encouraging patients to return their medications to the

pharmacy, Patients' expired, discontinued, and unused medications are collected. Calculation and recording of waste volume, as well as the rationale/causes/sources of waste, and use of this data to justify the necessity for waste reduction initiatives and obtain or retain sponsorship.

DISCUSSION

In many poor nations across the globe, HWM is a significant issue. HWM flaws may put all stakeholders in such societies at danger of health, safety, and the ecosystem. A thorough evaluation of their existing HWM methods in resource-constrained nations is required to address the problem. This may aid in the identification of gaps and the prioritization of available alternatives. These choices may be standardized and then utilized for monitoring and assessment in the future. This is a particularly pressing problem in underdeveloped nations. The bulk of these nations are in Asia, Africa, and Latin America, and their urbanization and population growth rates are typically high (2010–2014). In Pakistan, for example, 35 percent of the population lives in cities, and this number is expected to increase to almost half of the population within a decade. Cities in the developing countries lack the capacity needed to fulfill the demands of growing urbanization. Despite these obstacles, the government in these nations has not given public healthcare the attention it deserves. As a result, many critical healthcare actions go unnoticed. One of these activities is the safe handling of healthcare waste. Despite the fact that healthcare waste is controlled by law in many nations, the practical execution of these regulations is dubious. In these nations, the number of studies that measure hospital waste by categories and assess compliance with laws is inadequate. Members of disadvantaged minorities make up the majority of sanitary and housekeeping personnel in hospitals.

In the lack of training for hospital personnel, knowledge and awareness of appropriate waste management remain low. As a result, appropriate segregation protocols are rarely followed, and medical waste often ends up in landfills or open dumping grounds alongside household trash. People who live near these locations are exposed to public health hazards as a result of this. In certain cases, this trash is burnt without even any safeguards in place, posing environmental and occupational hazards. Furthermore, sanitary staff at hospitals and waste pickers in landfills labor without being immunized or wearing protective gear. This puts children at risk of infection and injury from needles and sharps. Near garbage dumps, stray animals and drug users are also prevalent, posing additional epidemiological hazards. The media has reported on the illegal selling of medical waste for recycling and reuse. These materials are used into toys and drinking straws. Laboratory liquid and chemical wastes are often discharged into public sewers without ever being treated. During floods and monsoons, clogged drains expose the population to additional health risks.

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