

**EVALUATION OF INTEGRATED SOLID WASTE
MANAGEMENT IN ROEMANI HOSPITAL**



A Thesis Submitted in Partial Fulfillment for The Requirements of Master Degree in
Environmental Sciences

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ABSTRACT

Hospital is a place for delivering health services. Hospitals will produce solid waste due to their health care related daily activities. If not properly handled, the waste will of cause harm to patients, visitors and the environment. Therefore, the importance of healthy environment around the hospital has become a prominent issue to analyze in order to find out problems associated to hospital solid waste management. This research aimed to analyze solid waste management at Roemani Hospital, Semarang. Object of the research is process of integrated solid waste management using data obtained from interview and observation pursuant on the Ministry of Health Decree of the Republic of Indonesia No.1204/Menkes/Sk/2004. These data were then subject to a descriptive analysis. Results of the study showed that solid waste management had not fulfilled the requirement of the Minister of Health Decree of the Republic of Indonesia No.1204/Menkes/Sk/2004. In the current solid waste management, phase segregation, collection, and disposal of end waste had not fulfilled the decree's requirements. Poorly trained personnel and the absence of personal protective equipment, as well as facilities were among the major problems in the management of solid waste. In short, the solid waste management at Roemani Hospital, Semarang did not meet environmental health requirements stipulated within Minister of Health Decree of the Republic of Indonesia No.1204/Menkes/Sk/2004. To make worse, resources of waste management was inadequate due to lacking of education training and personnel management, which should have been made available, supported by the application of appropriate guidelines and safety standards, provision of equipment and waste treatment facilities are safe for workers and the environment. Evaluation of waste management is a good management for creating the effectiveness and efficiency of solid waste management.

Key words : waste disposal, solid waste management, hospital.

ABSTRAK

Rumah sakit merupakan tempat pelayanan kesehatan. Rumah sakit dalam melaksanakan kegiatan, menghasilkan limbah padat yang mengganggu kesehatan. Jika tidak ditangani dengan baik akan menimbulkan kerugian bagi pasien, pengunjung dan lingkungan. Untuk itu perlu menganalisis masalah-masalah yang berhubungan dengan pengelolaan limbah padat rumah sakit. Jenis penelitian adalah survey yang bersifat deskriptif yaitu untuk menganalisis pengelolaan limbah padat di Rumah Sakit Roemani Semarang. Objek penelitian adalah proses pengelolaan limbah padat secara terpadu. Data diperoleh dengan cara wawancara dan observasi yang berpedoman pada Peraturan Menteri Kesehatan Republik Indonesia No.1204/Menkes/ Sk/2004 dan dianalisa secara deskriptif. Hasil penelitian menunjukkan bahwa pengelolaan limbah padat masih belum sesuai dengan Peraturan Menteri Kesehatan Republik Indonesia No. 1204/Menkes/Sk/2004. Pada pengelolaan limbah padat, tahap pemilahan, pengumpulan, dan pembuangan akhirnya belum memenuhi syarat. Tenaga yang kurang terlatih dan tidak menggunakan alat pelindung diri, sarana yang masih belum memenuhi syarat merupakan masalah utama dalam pengelolaan limbah padat. Sehingga, pengelolaan limbah padat di Rumah Sakit Roemani Semarang belum memenuhi syarat kesehatan lingkungan sesuai dengan Peraturan Menteri Kesehatan Republik Indonesia No. 1204/Menkes/Sk/2004. Sumber daya pengelola limbah yang belum optimal, sehingga perlu pelatihan dan pendidikan bagi tenaga pengelola limbah dari sumber hingga pembuangan akhir, penerapan pedoman yang sesuai standar dan aman, penyediaan alat dan sarana pengolah limbah yang aman bagi petugas dan lingkungan. Evaluasi manajemen pengelolaan sampah yang baik untuk efektifitas dan efisiensi pengelolaan limbah padat.

Kata kunci : pembuangan limbah, pengelolaan limbah padat, rumah sakit

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CHAPTER I

INTRODUCTION

1.1 Background

Hospital as an institution characterized by socio-economic functions and duties to provide health services to the community to the fullest. In providing health services, waste products that pollute the affected environment is possible.

Waste generated from hospital activities may pollute the environment, both domestic and clinical. In particular, the clinical waste needs a special handling in order to reduce, or eliminate, negative impacts that may arise.

In an effort of providing health services, the hospital is a meeting place for patients, employees, visitors and surrounding communities. The presence of interaction in it allows the spread of disease if not supported by good hospital environment condition. Activities generate a variety of hospital wastes in the forms of liquid, solid and gas.

Management of hospital waste is part of environmental sanitation activities in the hospital that aims to protect the public from the dangers of environmental pollution originating from hospital waste. Hospital waste is any waste generated by hospital activities and other supporting activities. Hospital wastewater may contain organic and inorganic materials. Whereas hospital solid waste consists of easily decomposing garbage, flammable wastes, and others.

Waste is likely to contain pathogenic microorganisms or harmful toxic chemicals that cause infection and can spread into the hospital environment due to a lack of health care techniques, poor handling of contaminated materials and equipment, as well as inadequate provision and maintenance of sanitation facilities. The types of hospital waste include medical waste, non-medical waste, pathological waste, kitchen waste, and radioactive waste.

Medical waste generated during routine patient care, surgery and in high-risk units. For example dirty bandage (dressing), body fluids, amputated limbs, needles and syringes used, the bag of urine and blood products. These wastes may be dangerous and result in a high risk of bacterial infection to other patients, hospital staff and the population in

general (visitors and residents around the hospital). Therefore they need to be clearly labeled as high risk.

Waste or hospital waste may be harmful because it can be toxic, infectious and radioactive. In addition, because of the activity or the nature of services provided, the hospital became the central of all kinds of diseases that exist in society, or the distribution of disease as well as the source, because it is always occupied, used, and visited by whom are vulnerable and weak from disease.

In 1999, WHO reported, in France there were 8 cases of HIV-infected workers, two of whom worked in medical waste handling. It evidenced that the need for good waste management not only on sharp medical waste but include overall hospital waste.

Incineration is a technology that converts solid material (in this garbage) into the material gas (exhaust gas), as well as solid materials that are unflammable, in the forms of ash (bottom ash) and dust (fly ash). Heat generated from the incineration process can also be used to convert any other matter and energy, for example, electricity and hot water. Incineration is a method of waste processing by burning waste in a furnace.

Waste incineration facility is recommended only to destroy/burn waste that cannot be recycled. It is not feasible to landfill. This tool must be equipped with control systems and controls to meet emission limits of particles and exhaust gases, thus ensuring the smoke exerted by the incinerator to be neutral in nature. Incineration has an end target to reduce the mass and the volume of waste, kill bacteria and viruses, reduce toxic chemical materials, as well as facilitate subsequent waste handling. Incineration is capable of reducing the volume of domestic solid waste up to 85-95% and weight reduction up to 70-80%.

The similar case also occurred at Roemani Hospital and the case had been detected since its establishment in 1975. Roemani Hospital was granted by Muhammadiyah. Health service activities undertaken at the hospital is based on Islamic law. As stated before that cleanliness is part of the faith, throughout the development the Roemani Hospital has received a lot of help and a certificate of accreditation in the field of hospital services. This shows that the Hospital Roemani has reached the goal, the vision and mission in achieving good quality health services.

However, in terms of sanitation and solid waste management there are several shortcomings of the Hospital Roemani, between the assessments, not all waste properly sorted, the provision of bins that are not in accordance with the standards, such as capless. Waste transport activities were not done correctly, such as less attention completeness of the officers of waste, and waste storage shelf life in excess of that stipulated in the Minister of Health. Before the incineration of medical waste, stored between 3-4 days. This exceeds the recommended time, i.e a maximum of 1 x 24 hours. Some of these deficiencies should be evaluated so that the achievement of an integrated waste management in the context of fulfilling the vision and mission of health care Roemani Hospital can be fulfilled.

1.2 Research Question

The research proposed the following research questions:

1. How much and where are the solid waste generated by Roemani Hospital ?
2. How is the implementation of integrated solid waste management in Roemani Hospital according to regulation ?

1.3 Research Objective

The research had the following purposes:

1. To investigate the source and quantity of solid waste generation at Roemani Hospital.
2. To evaluate the integrated solid waste management system adopted by the Roemani Hospital, and other elements related to solid waste management.

1.4 Research Scope

The scope of practical work was finding out the source of non medical waste and medical solid waste, the quality of solid waste, and all activities and operations processes in solid waste management conducted at Roemani Hospital based on the Minister of Health Decree of the Republic of Indonesia No. 1204/Menkes/Sk/X/2004 on health requirement of the hospital, including waste minimization, collection, sorting, storage, transportation, and incineration.

1.5 Research Originality

This study was performed to determine the evaluation of an integrated solid waste management at Roemani Hospital. The study was different from the previous studies because it did not conduct an evaluation of the incinerator that involved the third parties. Below is the explanation of previous studies that support the current research.

Table 1.1 Previous Researches

Researcher	Title, Year	Research Objectives
Sushant Prasad	A TQM Approach To Implementation of Handling and Management of Hospital Waste in Tata Main Hospital, 2000	Total Quality Management approach concept to implement proper handling and management of hospital wastes by The Government of India
Felicia Nemathaga	Hospital Solid Waste Management Practices in Limpopo Province, South Africa, 2007	Waste management practices to fix a serious mismanagement of hospital waste, which is typical of many semi-rurals hospital in South Africa, by reusing their incinerator.
Sutrisnowati	Infectious Solid Waste Management at Hospital (Case Study at Pupuk Kaltim Hospital), 2004	Evaluate the infectious solid waste management in Pupuk Kaltim Hospital.