

CREATING A GREEN HOSPITAL CONCEPT THROUGH THE MANAGEMENT OF NON-MEDICAL WASTE

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ABSTRACT

The management of non-medical waste in hospital and its environment to create Green Hospital is really needed by 'consumer' of health industries. The objective of this research was to know the correlation between the management of non-medical waste and the patients' comfort and satisfaction in hospital. Furthermore, this research is to know the effect of the Green Hospital concept to the patients' comfort and satisfaction. This research was done in Pare Public Hospital (RSUD Pare) in Kediri regency, East Java, Indonesia. The research method was using survey and giving questionnaire to the respondents as primary data. Data analysis of this research used SEM (Structural Equation Modeling). The result of research showed that the management of non-medical waste in hospital and its environment in creating Green Hospital concept gives positive influence and significantly gives comfort and satisfaction for patients. Thus, the direct effect was significantly gives comfort to the patients.

KEYWORDS: Management of non-medical waste, patients' comfort, patients' satisfaction, and Structural Equation Modeling (SEM).

I. INTRODUCTION

Nowadays, many hospitals in some countries in the world change their management process into better services and sustainable operational. It is in line with vision of the society in the world to support the development of any aspects, including health. Hagland (1993) stated that hot issues related to the responsibility of hospital to support the environment to be better had been already discussed since 1990s [10]. Right now, hospitals give more attention to the environment because it gives direct contribution to the patients and whole society members [8, 9, 12]. It can be said that hospital is a basic and significant infrastructure urgently needed for health and people in common.

At this moment, hospital is not only focusing on health but also becoming health services industry that can give contribution for potential human resource, increases efficient services, uses friendly material, lessens energy usage, and uses non-pollutant and toxic. Bedford Hospital is one of the hospitals that use principles of sustainable development with some basic aspects management and operational, such as adopts Good Corporate Citizen model, develops the relationship with local stakeholder, and follows the rules about environment policies in England [3]. In this time, hospital management has claimed integratively that gardens in hospital are very important for health therapy (Healing garden) [15].

Waste is very crucial problems in any hospitals [4, 12, 20]. In sustainable development, hospital has to be operated with minimum effect of waste. In fact, hospital waste contribution is one of dangerous pollutants to the environment. Zimmer and McKinley, (2008) said that one of important hospital contributions is lessening wastes and pollutants [20]. It can be concluded that the management of Hospital waste is very important in modern hospital, both developing and developed countries. Waste lessening is an important effort led to the hospital sustainability and development. Wastes solving, both solid and liquid, are focus in some discussion because hospital waste has direct effect to the quality of hospital environment.

Great attention in managing the hospital waste will minimize the pollution, so that it will give a real contribution to increase the higher quality environment. Rehdanz and Maddison, (2008) observes that there is high significance relationship between the quality of an environment and one's satisfaction [17]. Relationship between the quality of environment and satisfaction had been studied in some places with different social backgrounds and revenues [16, 17].

In Indonesia, the attention of non-medical waste management in hospital is based on Decree of the Ministry of Health number 1204 in 2004 (Kep. MenKes.RI No.1204/Menkes/SK/X/2004) about the Rules and Regulations of Health of Hospital Environment [13]. The rules have to be obeyed by all of the hospitals in Indonesia, includes in city or town and regency. The evaluation in waste management in a well-known hospital in big city has already been conducted and reported, but the application in regency and town has not fulfilled yet.

Green Hospital refers to a hospital that includes environment as part of quality services. It has characteristic such as, strategic location, efficiently water usage, energy and good air pollution, using good material and can be produced other product, keeps indoor environmental quality, provides good food, provides green environment (green education), has orientation for green product, non-toxic environment, green cleaning, waste reduction, and provides healing garden [18]. Thus, Green Hospital has to give attention to the sustainable design [14].

The targeted country of Green Hospital in 2020 is not only the developed countries but also the developing ones, including Indonesia. Some workshops and seminars about Green Hospital by Indonesian Ministry of Health (Depkes, 2012) have targeted that Green Hospital will already been applied in 2020 [7].

The purpose of this research is to know the correlation between the hospital management of non-medical waste and the patients' comfort and the patients' satisfaction. Moreover, it wants to know the effect of the waste management to the patients' comfort and the patients' satisfaction.

II. RESEARCH METHOD

This research was done in Pare Public Hospital (RSUD Pare) – Kediri regency, East Java, Indonesia – on October 2012. This research started from an assumption that waste management is one of important aspects for comfort of patient. Waste management and comfort can affect for satisfaction of patient. To know the correlation, the researchers arrange structural correlation hypothetic model that uses three aspects; they are waste management, patients' comfort and patient's satisfaction. The data collecting technique was using survey. The data for structural model was collected through questionnaire. The primary data was collected by giving questionnaires to the hospital occupants – 137 of 1,370 patients (10%) as samples – and deep interview to the hospital management staffs. The questionnaires were arranged to give response to some indicators of three aspects. The indicators of waste management, the first aspect, are the respondents' responses of waste sorting process, waste container, waste collecting and carrying, decimation, and non-medical waste composting. The patients' comfort indicators include the occupants' valuation of environment, fresh air, temperature, and humidity. The indicators of last aspects, patients' satisfaction, are reliability, specification appropriateness, durability, service ability, aesthetics, and quality assessment.

The step is analyzing the collected data using SEM (Structural Equation Modeling) to give brief explanation of structural correlation of the three aspects. Hair *et al.* (2006) stated that the minimum sample using SEM is 100 respondents [11]. Normal distribution checking using multivariate was done by calculating the correlation of Mahalanobis distance to the value of chi-square in free degree as many as the indicators used [19]. Next, the outlier univariate can be decided by determining the

threshold value [11]. In contrast, unidimensionality is a condition needed to analyze reliability and validity construct [1].

III. FINDING AND DISCUSSION

3.1 Hospital Management Policy

The research was done in Pare Public Hospital, which is located in Pare sub district of Kediri regency, East Java, Indonesia. The hospital is one and only of the government's health facility in Kediri regency that located in Pare sub district and has to give services to the other 26 sub districts and 344 villages. It has more complete facilities and nursing than private hospital, and gives better services to all people from different social level including recommended patients, and states employee with maximum efforts. About 700 patients come every day. Customers' Satisfaction is the highest priority of the hospital.

3.2 Correlation of Non-Medical Waste Management, Comfort and Satisfaction

This research developed structural model with 15 indicators and used 137 samples. Based on the numbers of the sample, the research has already fulfilled the terms of SEM analysis; there are more than 100 samples [11].

The Hospital management staffs give high attention to non-medical waste management by putting 36 of outsourcing employees divided into three shifts. In managing non-medical waste, the hospital staffs sort wet and dry waste into two different containers, with black plastic bag on each container, which have been provided on each room. Then, three times a day, the cleaning service officers collect and carry the waste to hospital garbage dump. The correlation of waste management, patients' comfort and patients' satisfaction is shown briefly on Figure 1 below

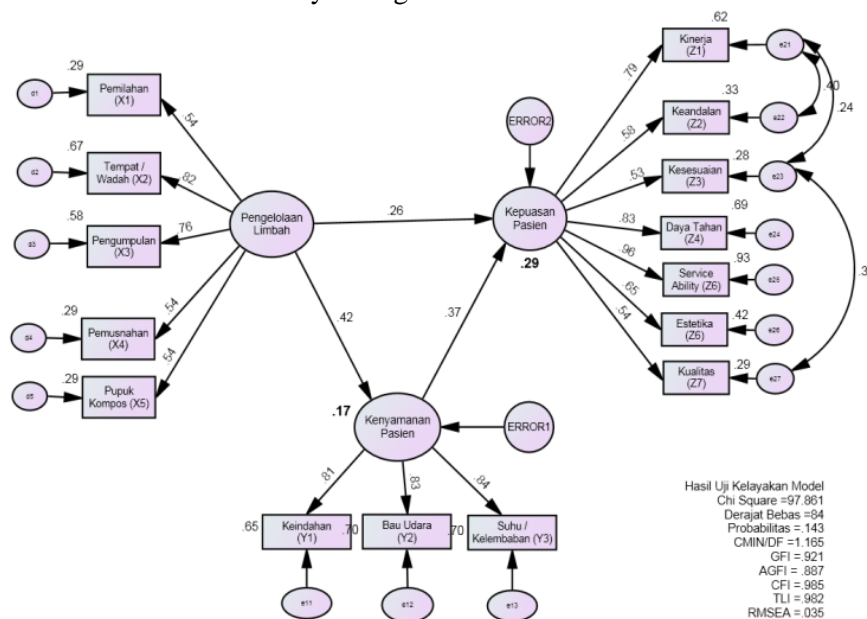


Figure 1: Structural Correlation between Hospital waste management, Patients' comfort and satisfaction.

Figure 1 showed that there are correlation between hospital waste management, patients' comfort and patients' satisfaction, the details explanation are as follow:

1. The correlations between hospital waste management (indicators: waste sorting process, waste container, waste collecting and carrying, decimation, and non-medical waste composting) and the patients' comfort (indicators: the occupants' valuation of environment, fresh air, temperature, and humidity) are significantly related.
2. The non-medical waste management is not only affecting to the patients' comfort but also to the patients' satisfaction because the hospital staffs are able to show their service ability and performance by giving quick responses to the patients' complain of waste in order to create a clean

and health environment. If non-medical waste management is better, the patients' satisfaction will be higher.

3. There is significant and direct relation between patients' comfort and patients' satisfaction. When the patients feel comfort with the hospital condition and environment which is supported with beautiful garden and park as healing garden and fresh air, the patients' trust will be more and they will back when they have health complain.
4. Considering the direct and significant relation; not only between the hospital waste management and the patients' comfort, but also between the patients' comfort and the patients' satisfaction; it can be said that there is significant relation between the hospital waste management and the patients' satisfaction.

Moreover, the effect of the hospital waste management to the patients' comfort and the patients' satisfaction is shown on Table 1.

Table 1: The Influence of the Hospital Waste Management to the Patients' Comfort and the Patients' Satisfaction

Nature of Influence		Co efficiency Standard	CR	p-value	Status
Exogenous	Endogenous				
Non-medical waste management (X)	Patients' comfort (Y)	0.417 **	4.031	0.000	Significant
Non-medical waste management (X)	Patients' satisfaction (Z)	0.260 *	2.474	0.013	Significant
Patients' comfort (Y)	Patients' satisfaction (Z)	0.371 **	3.388	0.000	Significant

Status : ns = not significant ($p\text{-value} > 0,05$); * = $p\text{-value} < 0,05$; ** = $p\text{-value} < 0,01$; CR = Critical Ratio

3.3 Non-medical Waste Management and Patients' Comfort

The management of non-medical waste gives direct effect to the patients' comfort (Table 2). The main Indicator for waste management was container (coefficient 0,816). Waste collecting and carrying (coefficient 0,759) is the second main indicator. The need and procedure of waste collecting and carrying; includes the ways, regularity, and tool or equipment; will give great effect to increase the patients' comfort and satisfaction.

Table 2: The Effect of Non-medical Waste Management to the Patients' Comfort

	Loading	C.R	p-value	Status
Waste soil sorting	0.538	5.742	0.000	Significant
Numbers of waste container	0.816	8.152	0.000	Significant
Waste collecting and carrying	0.759	Fixed	Fixed	Significant
Waste treatment	0.538	5.739	0.000	Significant
Composting	0.542	5.784	0.000	Significant

The hospital chief of maintenance unit, through interview on May 27, 2013, stated as follows:

"Although most of the patients and visitors are from low economic level and do not pay much attention of waste management and other facilities in the hospital, but the patients' and visitors' comfort and satisfaction can hopefully be increased through the waste management as one of the responsibilities of the hospital."

3.4 Non-medical Waste Management and Patients' Satisfaction

Non-medical waste management gives direct effect to patients' satisfaction. Main indicators to patient's satisfaction are service ability (coefficient 0,962) and durability (0,833). Good service at complain of customers about waste and quick response of hospital cleaning service in waste management is the reflection of patients' satisfaction.

The patients' satisfaction is the motto of Pare Public Hospital – Kediri regency. The hospital management staffs always evaluate its performances such as quick response, easy and comfort of cleaning services, and hygienic and complete facilities of waste management. The hospital chief of

training and education who has responsible of maintenance unit always take control and evaluate the staffs' performance and handle a meeting as well in order to increase the patients' satisfaction.

Reliability, in form of staffs' responsibilities are based on their capability, competence and experience. To optimize the staffs' performance, their earnings are in line with minimum salary of regional standard. Main duty and function of each staff of Hospital has suitable standard so each staff will do the duty based on his or her own job description (*appropriateness of specification*). As a result, it would be positive to increase services to the patients and visitors.

The general management unit, which takes responsibility to keep hospital facility, has used annual budget, which provided by the hospital management, in a good ways. So that, the durability of facilities such as dustbins, trolleys, garbage dumps and other facilities are always in good condition.

Table 3. The Effect of the Waste Management and the Patients' Satisfaction

Indicators	Loading	C.R	<i>p-value</i>	Status
Performance	0.790	7.107	0.000	Significant
Reliability	0.579	5.322	0.000	Significant
Appropriateness of Specification	0.532	Fixed	Fixed	Significant
Durability	0.833	6.555	0.000	Significant
Service Ability	0.962	6.891	0.000	Significant
Aesthetics	0.649	5.726	0.000	Significant
Perceived Quality	0.540	6.388	Fixed	Significant

Excellent services that showed by giving quick responses, competences and good management of patients' and visitors' complains as part of services abilities have given satisfaction to the patients and visitors too.

Friendly acts from staffs and nurses, modern and complete tools and equipments, architecture design, well-decorated rooms, comfortable rooms, beautiful garden and fresh air are other excess of this hospital. By keeping so, the hospital management hopes that it could help patients to be better from his or her illness as soon as possible.

To build a good reputation is not only doing the job based on the job description but also with full of responsibility and self awareness. Self-awareness in this research means that the activities of waste management are not only done by cleaning service staffs but also by all staffs member from top to the bottom. It does not mean that nurses, for example, interfere directly in handling the waste management, but they can start it by putting the non-medical waste into different dustbins provided. One of vice directors of the hospital consolidated the situation above through his statement on the interview on May 31, 2013, as follows:

"The problem of waste management in the hospital is quite simple since it is a regular and common activity for our staffs. Moreover, there are no crucial problems faced by our cleansing staffs since the other staffs member are also helping them by putting the waste into different dustbin. As the result, we can minimize the patients' and visitors' complain of the waste management, so that we can hold tight our motto to give the best satisfaction to the patients and visitors."

3.5 The Patients' Comfort and the Patients' Satisfaction

Patients's comfort has direct effect to the patient's satisfaction. Main indicators to patients are air humidity (coefficient 0,838) and bad smell (coefficient 0,834). Planting many plants as an effort of collecting and carrying the waste in procedural waste management to create clean and green environment gives great effect to the patients' satisfaction.

Table 4 Result Hipotesistest Model to patients's comfort

Indicators	Loading	C.R	<i>p-value</i>	Status
Beauty	0.809	10.152	0.000	Significant
Fresh air	0.834	Fixed	Fixed	Significant
Humidity	0.838	10.459	0.000	Significant

Fresh air, beautiful garden, and no swampy soil or mud can increase the patients' comfort. For stayed patients, they have quite large experience in the hospital in such of situation so they can tell to others about the cleanness, the beauty, and the competence of the staffs of the hospital. As the result, when they or their relatives, friends, or neighbours who get medical problems or just want to have a medical

check up, they will trust the hospital to take care of them or recommend the hospital to their relatives, friends, or neighbours; even though it is quite far from their residents.

The following statement is from one of surgeon of Pare Public Hospital – Kediri regency through interview conducted on May 29, 2013.

“Most patients are not paying much attention of the comfort. They just focus on their own health. Getting better and getting good and quick services and responses are their main point. But, when they are recovery from their illness they will comment and tell their experience; especially about the condition, cleanness and the staffs’ cares and competences; to other; of course on their own viewpoint and in different versions.”

Non-medical waste management, which is done by the hospital, gives indirect effect to the patients’ comfort and satisfaction. On the other hand, careless management of non-medical waste will decrease the patients’ comfort and satisfaction.

The management of non-medical waste of Pare Public Hospital did not create the patients’ satisfaction in direct way. However, arrange some plants and flowers into a beautiful garden and wonderful park with many trees have many functions, such as: comforting, less air pollution and relax situation. This condition make patients in the hospital not only comfort but also satisfied.

IV. CONCLUSION

The management of non-medical waste in hospital and its environment to create Green Hospital is really needed by people and all stakeholders in order to achieve a healthy life. The management of non-medical waste in terms of waste container, and waste collecting and carrying give direct effect to the patients’ comfort and satisfaction. Although the management of non-medical waste does not give direct effect to patients’ satisfaction, but the patients’ comfort shows that the patients are satisfied with the environment built. Thus, the patients’ comfort give effect to the patients’ satisfaction.

The indicators of patients’ comfort are fresh air, temperature, and humidity of the hospital. Planting some big trees and flowers as the efforts to minimize bad smell caused by waste and garbage can increase the patients’ satisfaction.

The patients’ satisfaction is showed by service ability and durability. Good services and quick responses of patients’ complain about waste and garbage shows high intention, attention, and competence of the hospital staffs.

Cosnidering the correlation among the variables; the hospital waste management give diract effect to the patients’ comfort and the patients’ comfort affects directly to the patients’ satisfaction; it can be concluded that the hospital waste management affects the patients’ satisfaction. However, the patients’ satisfaction can be raised up if only their camfort raised up.

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