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Implementation of Green Hospital Based on Size Performance Management and Environmental Performance Framework at The Baptist Hospital of Batu

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ABSTRACT : *The implementation of the green hospital concept at Baptist Hospital of Batu was carried out to find out what factors hindered implementation based on the management and environmental framework. This is also done to create a green hospital assessment based on an in-depth assessment model using a management and environmental performance analysis scheme.The sample in this study was included in the purposive sampling category, totaling 78 people calculated by the slovin formula. The analytical method used is the Malcolm Baldrige method, Integrated Environmental Performance Measurement System (IEPMS) and t test.Baptist Hospital of Batuwhen analyzed with a green hospital application management framework is still in the early improvement status. The results of the t-test on each performance indicator show a significant relationship that can affect the implementation of green hospital. Baptist Hospital of Batu, which was analyzed using an environmental framework, showed the highest weight on waste at 0.473, meaning the hospital was more focused on waste. The results of the Traffic Lights System (TLS) resulted in 25 KEPI in the green category (very good), 10 KEPI in the yellow category (good), and 6 KEPI in the red category (poor). However, for KEPI with the red category, only KEPI number 1 needs to be improved.*
KEYWORDS: *Green Hospital, Management Performance, Environmental Performance.*

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I. INTRODUCTION

The Green Hospital concept has developed into a new approach to hospital management. The existence of a hospital as a regional ecosystem unit in an area amidst the issues of climate change and global warming, as well as environmental degradation, is able to be responsible for the sustainability of environmental quality and the use of natural resources (Bharara et al, 2018) (Hospital operational needs need to be based on the principle of eco-efficiency in order to fulfill the concept of sustainable development (sustainable development) in the health sector (Zadeh et al, 2016).The concept of sustainability that prioritizes the environment in the health sector requires the involvement of almost all elements that are directly related, the involvement of policy makers, namely the government, is a must (Pourmohammadi et al, 2020). In Indonesia, for example, the government paid special attention to hospital management based on sustainable development by issuing a policy from the Indonesian Ministry of Health through the Guidelines for Environmentally Friendly Hospitals in October 2018, this is an effort to to carry out the mandate of Law no. 36 of 2009 on health and Law no. 32 of 2009 concerning Environmental Protection and Management which prioritizes the environment as the goal of development and management.

Green hospital as an effort to support sustainable development with the aim of having a large positive impact on health and well-being for patients, staff, visitors, as well as efficiency in energy management, natural resources, waste management, and financial performance. However, the obstacles to implementing green hospitals in Indonesia are generally processes, technological changes, and work culture (Putri et., al 2017). The emergence of this obstacle is due to the unpreparedness of hospital management in making transitional efforts from the previous concept to a green hospital. According to data from the Indonesian Health Profile in 2018, there are 2776 hospitals spread across 34 provinces that are committed to implementing the Green Hospital concept, but in practice they face many obstacles. One of the obstacles that often occurs is the unpreparedness of hospital management in managing it. Management unpreparedness is caused by the lack of leadership awareness

of the green hospital vision, staff performance that tends to be weak, and lack of understanding of environmental sustainability (Susanto &Nopiyanti, 2020).

The application of green hospitals in various hospitals in Indonesia reaps success and failure, both of which are strongly influenced by management performance in applying the green hospital concept. The problem that often occurs is that the performance of green hospitals is always measured symbolically, such as making hospital buildings green or blue or by competing to plant lots of trees. Green hospital performance is rarely understood substantively by measuring the ability of hospital management to manage waste or how hospitals manage energy and water, as well as how hospitals deal with losses experienced by the community in their operational processes (Madan et al, 2018).

In the context of green hospitals, especially in Indonesia, the performance measure of hospitals that implement green hospitals is measured based on compliance with green hospital guidelines issued by the Ministry of Health and the implementation of green hospitals is left to the hospital's own policy. So from the performance of the management of each hospital this will show the success or failure of the green hospital concept. On the other hand, the trend of performance reference in green hospitals in Indonesia is only measured by the hospital's ability to manage waste.

This study measures environmental performance in the application of the green hospital concept using the Integrated Environmental Performance Measurement System (IEPMS) approach combined with the law on hazardous waste management. The performance of hospital management in implementing the green hospital concept is measured using Malcolm Baldrige's performance analysis combined with testing the partial relationship (t) for each management performance indicator on the implementation of green hospital. Where this method is used so that performance analysis can be carried out as a whole, considering that hospitals also operate with the aim of profit. Management performance appraisal indicators are measured through 7 (seven) criteria, namely leadership, strategic planning, customer focus, measurement, analysis and knowledge management, workforce focus, process management, and results. Analysis of the implementation of the application of the green hospital concept in hospitals was carried out to find out what factors hindered implementation based on the Management framework and environmental framework, and used to create a Green Hospital assessment based on an in-depth assessment model using a management and environmental performance analysis scheme.

II. GREEN HOSPITAL IMPLEMENTATION

The implementation of the principle of an environmentally friendly hospital (Green Hospital) must be carried out in a comprehensive manner, the implementation model must fulfill every strategic aspect so that the results of each planning can be met. According to Ahsan & Rahman (2017) implementation, especially in the health sector, is broadly similar to other sectors, what makes the difference is that each implementation must be carried out in a measurable and thorough manner by considering various strategic stages in order to achieve maximum results. The implementation must go through strategic stages as outlined in the approach, namely: 1) Policy and Planning. 2) Implementation and Operation. 3) Checking and Repair Efforts. 4). Reviewing Management Implementation.

III. ENVIRONMENTAL PERFORMANCE MEASUREMENT

The environmental performance measurement system is the result of a systematic design and is based on a group of activity performance indicators in the form of input, output, result, benefit and impact indicators. The design of the environmental performance measurement system is used as a basis for designing success and failure in carrying out activities in accordance with the goals and objectives that have been set in order to realize the vision and mission.

One of the models for analyzing environmental performance is the Integrated Environmental Performance Measurement System (IEMPS). IEPMS is one of the methods used to measure environmental performance. This method uses quantitative and qualitative measures. These measurements are used together to provide clues in the exact measurement. Blass et al (2016) define Integrated Environmental Performance System (IEPMS) as one of the methods used to measure environmental performance. This method uses quantitative and qualitative measures. These measures are used to provide guidance in the appropriate performance measurement.

IV. MANAGEMENT PERFORMANCE MEASUREMENT

a. The Malcolm Baldrige National Quality Award (MBNQA)

Malcolm Baldrige Criteria for Performance Excellence (MBCPE) or Baldrige Criteria is a guide for a company to achieve high quality performance which consists of 7 criteria, namely leadership, strategic planning, customer focus, measurement, analysis and knowledge management, workforce focus,

management process and results. The Baldrige criteria include philosophy and goals, organization, and evaluation process. Baldrige Assessment serves as a tool to measure and evaluate management performance. Institutions that can implement the Baldrige assessment include companies in the manufacturing, service, and small business categories, as well as health and education institutions. With the Baldrige assessment, it can help organizations face a dynamic environment, build a high work system, translate vision and mission into strategies, build short-term success and organizational stability for the long term. There are 7 (seven) categories assessed in the 2015-2016 Baldrige Excellence Framework series with a total score of 1000 points from the Baldrige Assessment, namely:

1. Leadership (120 points)
2. Strategy / Strategy (85 points)
3. Customer (85 points)
4. Measurement, Analysis, and Knowledge Management/Measurement, Analysis, Knowledge Management (90 points)
5. Workforce (85 points)
6. Operation work (85 points)
7. Results (450 points)

b. Conceptual Framework of the Research

The conceptual framework is used to explain the approach to implementing the green hospital concept in an effort to support sustainable development initiated by WHO, especially in hospitals that are considered to be implementing the green hospital concept. This implementation model will be tested through how the readiness of the hospital which is the object of research prepares two important elements in the application of a green hospital, namely environmental performance through IEMPS, while management itself is measured by measuring management performance using the Malcolm Baldrige scheme and tested with a partial test (t). to see the relationship of each management indicator to the green hospital indicator.

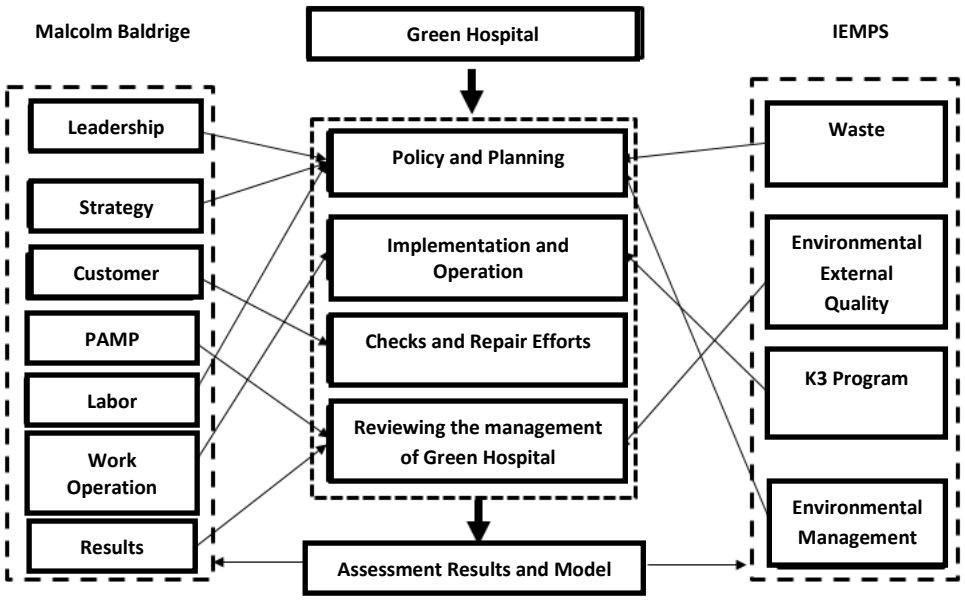

Fig.1. Conceptual Framework

V. RESULT OF THE RESEARCH

a. Participants and Data Collection

This research on the implementation of Green Hospital through the Criteria for the Management Performance Framework and Environmental Performance was carried out at the Baptist Hospital of Batu City in 2022. The sample determination used a purposive sampling technique where the sample was

determined by the Slovin formula, the number of samples used in this study was 78 people out of 345 Baptist Hospital of Batu staff.

b. Management Performance Analysis

No	Category	Max Points	Points	%	Interview Points	%	Average Points
1	Leadership	120	84,15	70,13%	20,50	17,08%	52,32
2	Strategy	85	57,58	67,74%	17,25	20,29%	37,41
3	Customer	85	65,78	77,38%	17,25	20,29%	41,51
4	PAMP	90	64,25	71,38%	18,00	20%	41,12
5	Labor	85	62,08	73,03%	14,99	17,64%	38,54
6	Work Operation	85	61,35	72,18%	19,24	22,64%	40,30
7	Results	450	326,41	72,54%	102,47	22,77%	214,44
Total		**1000**	**721,60**	**72,06%**	**209,69**	**20,10%**	**465,65**

The table shows that the total score achieved by Baptist Hospital of Batuwas 465.65. This means that for the hospital performance assessment based on MBNQA, Baptist Hospital of Batu achieved the average predicate and was included in the early improvement category (point scale 376-475). Early improvement means that Baptist Hospital is in an early stage of improving the application of the green hospital concept.

Score Obtained	Criteria	Points of Baptist Hospital
876-1000	*World Leader*	
776-875	*Benchmark Leader*	
676-775	*Industry Leader*	
576-675	*Emerging Industry Leader*	
476-575	*Good Performance*	
376-475	*Early Improvment*	**465,65**
276-375	*Early Result*	
0 -275	*Early Developmant*	

Generally, the performance of Baptist Hospital of Batu is quite good in terms of management performance, although in the context of implementing the green hospital concept it is still not as expected. In some categories there are quite high differences in the scale of strategy and leadership. Therefore, improvements need to be prioritized in this category. More specific aspects can be compiled based on the data that has been obtained. The management aspect specification above is measured by t-test to determine the significance of management performance on the implementation of green hospital in hospitals. Stone Baptist.

c. Analysis of the Relationship Between Management Performance Categories and Green Hospital

After determining the predicate and level of RS performance. BaptisBatu towards the application of green hospital, the next step is to analyze the relationship between categories on the dimensions of management performance with the dimensions of green hospital. The analysis was carried out by performing a partial test (t) on the data from the questionnaire. The relationship between the categories of management performance dimensions and green hospital can be seen in the following table.

No	Indicator	t Count	t Table	Sig
1	X1 (Leadership)	4.488	1.665	0.000
2	X2 (Strategy)	5.073	1.665	0.000
3	X3 (Customer)	2.895	1.665	0.000
4	X4 (PAMP)	6.157	1.665	0.000
5	X5 (Labor)	5.553	1.665	0.000
6	X6 (Work Operation)	13.356	1.665	0.000
7	X7 (Results)	6.925	1.665	0.000

From the table, it is found that the green hospital variable can be influenced by all variables of management performance dimensions (significance value (p) < 0.01), where all categories of management

dimensions have a significance value of 0.000 and have a t-count value > from the t-table value (1.665).). The calculation is done by partially testing each indicator in the management dimension against every indicator in the green hospital dimension, the selection of testing is adjusted by looking at the results of calculations from the previous analysis, namely the Baldrige analysis, after which it is determined which dimensions have assumptions that are able to influence and strengthen the dimensions in green hospital variable.

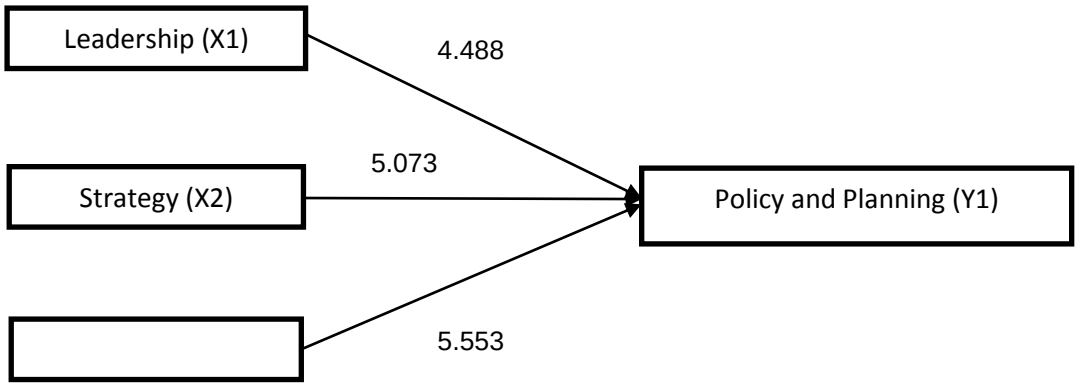

Fig.2. tTestResults of Model 1

In the first model, three management indicators, namely leadership, strategy and workforce, have a significant influence on one of the indicators in green hospital, namely policy and planning. In implementing the green hospital policy, leadership is needed who is able to apply several aspects, namely: 1) Applying the principles of an environmentally friendly hospital. 2) Strive to protect health, safety and create comfort for hospital residents by controlling the negative environmental impact of hospital activities. 3) Implement the principle of efficient use of energy, water and material resources. 4) Always comply with applicable health, hospital and environmental laws and regulations. 5) Contribute to preventing and controlling global environmental impacts (Ahsan & Rahman, 2017). To fulfill the policy and planning aspects, strategy and manpower are needed, where these aspects have a major influence on the successful implementation of policies and plans (Ahsan & Rahman, 2017).

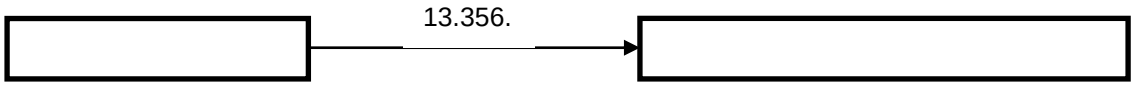

Fig.3. t TestResults of Model 2

In the second model, the management indicators, namely work operations, have a significant relationship with the green hospital indicators, namely Implementation and Operations. Where this is a reference for how organizations design, manage, and improve system work for patient satisfaction and stakeholders have a direct effect on all hospital operational activities that are equipped with SOPs/instructions, work/manuals that are monitored regularly, and socialized to all related parties. SOPs/ work instructions are also posted at each location of related activities that are part of the implementation and operation.

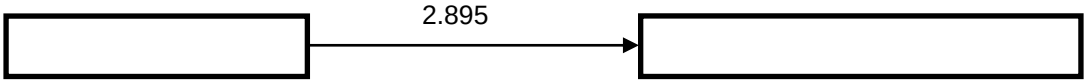

Fig.3. t TestResults of Model 3

In the third model, the management indicator, namely the customer, has a significant relationship with the green hospital indicator, namely checking and repairing. Customers have an important aspect in determining how the organization determines the needs, expectations, choices of customers and also the market to ensure the linkage of health services and develop new opportunities in health services where if there are aspects that reduce service to customer needs, the hospital needs to monitor the health services. progress and performance with an emphasis on measuring and monitoring aspects of inputs, processes and outputs. If problems are found, then it is necessary to take continuous corrective actions. All results of activities must be recorded through good records management and if necessary audited by the hospital.

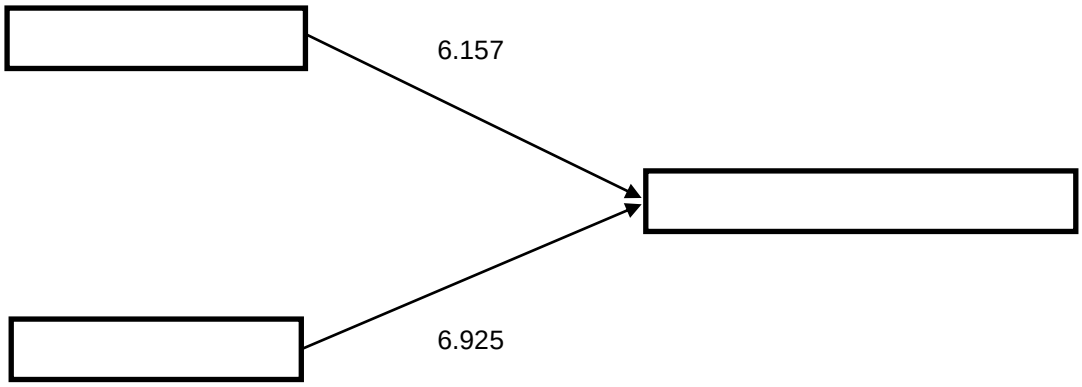

Fig.4. t TestResults of Model 4

In the fourth model of management indicators, namely the customer has a significant relationship to the green hospital indicator, namely a review where review is a comprehensive evaluation activity of all programs that are prepared and implemented in the field, in order to identify problems that hinder program implementation and find solutions that need to be implemented and develop environmentally friendly innovation (Ministry of Health, 2018). In the management framework, a process is needed to examine how an organization selects, obtains, analyzes, organizes, and develops its data, information, and knowledge assets. In addition, efforts are also needed to re-examine how an organization reviews its performance so that it is able to get maximum results from the implementation and improvement of the organization in the scope of the results of health services and services provided, patient and other customer satisfaction, financial and market performance, results - Outcomes of staff and work systems, operational performance, leadership and community responsibilities. This level of performance will also be tested by competitors and other organizations engaged in the same field, namely healthcare.

d. Environmental Performance Analysis

Evaluation of the performance measurement system is carried out using TLS by including KEPI in the color category. The results of the TLS evaluation can be seen in the figure. Identification of environmental aspects on the environmental performance of the Environmental Sanitation Installation (IPL) refers to environmental measures. These measures include waste, external environmental quality, K3 program, and environmental management.

The four environmental measures were further reduced to 9 environmental aspects, namely liquid waste, solid waste, gas emissions, ambient air, IPL soil content, use of PPE (Personal Protective Equipment), K3 training programs, audit programs, and environmental awards. The design of the environmental performance measurement system resulted in 41 KEPI (Key Environmental Performance Indicators) which were obtained from the environmental aspects identified at the beginning of the study. In the liquid waste aspect it produces 8 KEPI, the Solid Waste aspect produces 5 KEPI, the Gas Emissions aspect produces 8 KEPI, the Ambient Air aspect produces 9 KEPI, the Soil Content aspect produces 6 KEPI, the PPE Use aspect produces 2 KEPI, and the K3 Program aspect, the Audit Program , Environmental Awards each resulted in 1 KEPI.

In designing the performance measurement system, weighting is also carried out to determine the size or aspect that is considered the most important in determining the level of performance of a work unit. The measure that has the highest weight is waste, with a weight value of 0.473 this means that the hospital is more focused on waste, while the liquid waste aspect is the aspect with the highest weight value of 0.229, meaning that liquid waste is an aspect that is very concerned by the hospital. The results of the TLS (traffic lights system) resulted in 25 KEPI in the green category (very good), 10 KEPI in the yellow category (good), and 6 KEPI in the red category (poor). However, for KEPI with the red category, only KEPI number 1 which really needs to be improved in its performance, this is because the KEPI is already approaching the set quality standard threshold, while for the other five red KEPI categories it is still very far from the quality standard threshold but has poor performance. satisfactory compared to previous years. The total result of environmental performance assessment is 7,687.

B3 waste management which consists of; policies, B3 waste management planning, volume recording, packaging, storage, transportation, emissions from B3 waste management, B3 waste effluents, quality standards for the use of waste products, criteria for quantities managed according to regulations as well as evaluation and

reporting. Besides B3 waste, the fifth attribute is non-medical waste management which consists of 6 (six) sub-attributes namely; related to policies, planning, implementation, evaluation and reporting on the management of non-medical waste/household waste.

Environmentally friendly hospital environmental management is not enough just to understand the downstream, but it is also very important to know the upstream. In addition, the management of the hospital environment does not only focus on the output of activities in the form of waste, but also on the input, namely the materials used, both medical and non-medical. Medical and non-medical material attributes consist of sub-attributes of environmentally friendly medical/non-medical material procurement policies, material/material receipts, distribution, storage, use or utilization and disposal or elimination.

Waste management from the Baptist Hospital of Batu has a neat mechanism and also a B waste mitigation plan so that the hospital has preparedness to face various kinds of unexpected disasters, so as to minimize the occurrence of victims or losses. Baptist Hospital of Batu is very concerned about the management of this hazardous material by having a list of chemicals or B3 used along with a safety data sheet and having a chemical or B3 management guide to protect patients, workers, public health and the environment. There is also a special room for storing cleaning materials and general B3 which are neatly arranged and according to the type of material. The B3 storage room is divided into 2, namely medical B3 waste which has 1 spacious chamber and general B3 waste with 7 chambers, each chamber grouped by type of B3 waste such as lamps, oil, cartridges, batteries, chemical residues and drugs.

The use of non-mercury medical devices in the form of digital has been applied to tensimeters, thermometers, laboratory incubators, room thermometers, scales and x-rays or computed radiography. This reduces the risk of mercury exposure to both patients, hospital workers and the environment. Efforts to use unleaded pipes and environmentally friendly detergents have been made by the hospital. However, there are three requirements that have not been implemented, namely efforts to reduce batteries, use air conditioning and a freon-free refrigerator or freezer. However, the commitment to using non-mercury medical devices is emphasized by slogans and campaigns placed in every corner of the hospital room. The seriousness of the hospital is aimed at improving services to patients. Commitment to the use of non-mercury medical devices by the hospital. Baptis Batu received a good appreciation and received an award from the Ministry of Health in 2021, as a health service facility that does not use mercury medical devices.

VI. CONCLUSION

Baptist Hospital of Batu is currently undergoing the Green Hospital process and the results of this study show that 67% of the implementation has been carried out by the hospital. The inhibiting factors are 1) There is no written regulation regarding the implementation of Green Hospital in a holistic and detailed manner. 2) There is no special work team to handle green hospitals. 3) Places for solid waste management and waste sorting are still limited so that they cannot be managed optimally. 4) Limited human resources in several work units lead to less than optimal movement and results. Baptist Hospital of Batu when analyzed with a green hospital application management framework is still in an early improvement status where the performance of Baptist Hospital of Batu still has to be developed again. The influence of management performance is very important for the success or failure of a green hospital implementation process, this is supported by the t test where management performance has a significant impact on implementation.

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