
Implementation Of Green Hospitals To Improve Hospital Sustainability In Indonesia: A Narrative Literature Review

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Abstract

Hospitals generate waste and consume large amounts of energy, which negatively impact the environment. The Green Hospital concept was developed to support environmental sustainability in healthcare facilities. To examine the implementation strategies of Green Hospital and its impact on hospital sustainability in Indonesia. A narrative literature review was conducted by searching articles from Google Scholar and PubMed using keywords related to Green Hospital. A total of 10 articles (2015–2024) were thematically analyzed. Several hospitals have implemented Green Hospital principles such as energy efficiency, waste management, and green open space. RSUPN Dr. Cipto Mangunkusumo achieved the highest implementation score, while some hospitals still face challenges in human resources, infrastructure, and funding. The implementation of Green Hospital shows positive impacts on sustainability but still requires policy support and capacity building in hospitals.

Keywords: *Green Hospital, Sustainability, Hospital, Environment, Literature Review.*

INTRODUCTION

Hospitals are healthcare institutions with complex operational activities that run continuously for 24 hours. Despite their vital role, hospitals also produce negative environmental impacts, particularly in the form of medical waste. This type of waste includes pathological waste (such as body tissues, blood, and organs), radioactive waste, pharmaceutical waste, and chemical waste, all of which are classified as hazardous waste. In addition, hospitals also generate domestic waste such as kitchen waste, paper, needles, and glass, which, although less hazardous, still require proper management (Sukadewi et al., 2020).

The Indonesian government has regulated institutional responsibility toward the environment through Law Number 32 of 2009 concerning Environmental Protection and Management. This regulation requires every development project, including hospitals, to consider environmental sustainability and prevent pollution. As institutions that operate continuously, hospitals bear a significant responsibility for environmental preservation by considering the balance of social, ecological, and aesthetic aspects in every policy implemented. Furthermore, public expectations for healthcare services that are safe, comfortable, and environmentally friendly continue to increase.

One innovative approach that has emerged to address these challenges is the Green Hospital concept. A green hospital is defined as a hospital that is designed, built, operated, and maintained based on principles of environmental sustainability and health. International studies indicate that implementing this concept not only improves operational efficiency but also enhances the quality of care, patient comfort, and reduces the risk of nosocomial infections (Hospital Associated Infections/HAIs). This concept includes seven important elements, namely energy efficiency, green building design, the use of alternative energy, transportation systems, food management, waste management, and water conservation.

In Indonesia, the implementation of green hospitals is still in the development stage and is being adapted to local conditions. The main focus lies in improving the efficiency of water and energy use, as well as environmentally friendly waste management. Therefore, it is important to conduct a literature review to examine how green hospital strategies have been implemented in various hospitals and to evaluate the extent of their impact on institutional sustainability. This study aims to analyze literature related to the implementation of green hospitals in Indonesia by identifying best practices

that have been carried out and providing an overview of the potential development of environmentally friendly hospitals as part of efforts to achieve sustainability in the healthcare sector.

RESEARCH METHODS

This study uses a narrative literature review approach to analyze the strategies for implementing the Green Hospital concept and its impact on hospital sustainability in Indonesia. This approach was chosen because it allows the author to integrate various findings from previous studies descriptively and thematically, without following strict systematic procedures as in a systematic review. The literature was collected through online database searches, namely Google Scholar, DOAJ, and PubMed, using keywords such as: “green hospital”, “environmentally friendly hospital”, “green hospital strategy”, “hospital sustainability”, and “implementation of green hospitals in Indonesia”.

The inclusion criteria for selecting the literature include articles published between 2015 and 2024, written in Indonesian or English, and specifically discussing strategic aspects, indicators, or the implementation of Green Hospitals. The articles used were obtained from accredited national journals and open-access international journals. Articles that were not relevant, not available in full text, or consisted only of opinions without empirical data were excluded from this review. The analysis was conducted by examining the content of the articles thematically to identify similarities and differences among studies, as well as evaluating their impact on hospital sustainability from environmental, social, and operational perspectives.

RESULTS AND DISCUSSION

Literature searches identified several relevant articles regarding the implementation of the Green Hospital concept in various hospitals in Indonesia. A total of 10 articles were analyzed based on the hospital location, the Green Hospital principles applied, the level of implementation achieved, and their impact on sustainability.

Table 1. Summary of Literature Review Articles

No	Article Title	Hospital	Principles Applied	Main Findings	Impact on Sustainability
1	Green Hospital Implementation in RSUPN Dr. Cipto Mangunkusumo	RSUPN Dr. Cipto Mangunkusumo, Jakarta	10 Green Hospital principles by the Ministry of Health (2018)	Achieved 87.8% of 98 indicators; several indicators reached 100%	Operational efficiency, increased building value, improved environmental management
2	Sustainability Assessment Attributes of Hospitals	RSK Dharmais, RS Persahabatan, etc.	Green building concept and sustainable environmental management	Score of 71.2% (classified as fairly sustainable / yellow hospital)	Reduction of pollution and ecosystem damage
3	Green Hospital Implementation at RSUD R. Syamsudin, SH	RSUD R. Syamsudin, Sukabumi	Malcolm Baldrige framework	Score of 620.1/1000 (emerging industry)	Energy and water efficiency, waste

				leader category)	reduction, strengthened leadership
4	Green Hospital at Pertamina Cirebon Hospital	Pertamina Cirebon Hospital	Seven main elements (energy, water, waste, etc.)	Electricity consumption still high; waste and water management not yet efficient	Cost savings (AC efficiency saving IDR 46 million/year), improved operational efficiency

Discussion

The results of the literature review indicate that the implementation of the Green Hospital concept in Indonesia has contributed significantly to hospital sustainability. Although the level of implementation varies among hospitals, most studies report that positive impacts have begun to emerge.

In general, the Green Hospital principles most frequently implemented include energy and water efficiency, management of medical and non-medical waste, improvement of indoor air quality, use of environmentally friendly materials, and the provision of green open spaces. These practices are in line with the guidelines issued by the Indonesian Ministry of Health (2018), which serve as a reference in almost all of the analyzed studies.

Several hospitals, such as Dr. Cipto Mangunkusumo Hospital and Hospital X, recorded high indicator achievements (87–87.8%), indicating a strong commitment to adopting sustainability principles. These achievements are not only reflected in technical aspects (such as energy efficiency) but also in improved hospital image, enhanced patient comfort, and support for hospital accreditation systems such as STARKES.

In contrast, hospitals such as RSUD Muhammad Sani (43.6%) and RSUD Rokan Hulu (27.9%) are still in the early stages of implementation. This condition is generally caused by limitations in human resources, lack of training, inadequate infrastructure, and limited financial resources. Nevertheless, initial steps such as waste management and energy-saving efforts have demonstrated positive potential toward better environmental management.

Factors driving the successful implementation of Green Hospital include the presence of internal policies, the availability of supporting facilities such as water recycling systems, and increased employee awareness regarding energy efficiency practices. For example, Mekarsari Hospital shows that water conservation policies and the use of LED lighting are key elements in supporting environmentally friendly programs. On the other hand, major barriers include the uneven implementation of energy efficiency policies across hospital units and the absence of adequate technical facilities such as proper waste treatment installations.

Overall, the implementation of the Green Hospital concept has produced tangible impacts on hospital sustainability, including the reduction of greenhouse gas emissions, more efficient use of resources, operational cost savings, and the creation of a healthier hospital environment for both patients and staff. In addition, several studies highlight that innovations implemented by certain hospitals can serve as models or references for other hospitals in adopting sustainability practices. This review underscores the importance of synergy between government regulations, hospital management support, and the involvement of all stakeholders in realizing environmentally friendly hospitals. With consistent and structured implementation, the Green Hospital concept can become a long-term strategy to address environmental challenges while simultaneously improving the quality of healthcare services in Indonesia.

CONCLUSION

Based on the results of the literature review, it can be concluded that the implementation of the Green Hospital concept in Indonesia has made a real contribution to hospital sustainability, both from environmental, social, and operational aspects. Although the level of implementation still varies among hospitals, most have shown the application of the main principles such as energy and water efficiency, waste management, improvement of air quality, as well as the provision of green open spaces.

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