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The Literature and Policy Review of the Implementation of Green Hospital Concept in Indonesia

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Abstract: The Green Hospital Model is crucial for aligning healthcare facilities with sustainable development goals. Implementing green initiatives in hospitals in Indonesia faces challenges despite the country's efforts to improve healthcare infrastructure and services. This study aimed to review pieces of literature (abroad and in Indonesia) and policies and regulations related to green hospitals in Indonesia. This study carried out some literature and policies to compare and have a deep understanding of stakeholders' role in collaborating to implement the green hospital in Indonesia. Totally 7 journal articles from outside and inside Indonesia were included in this study from databases Science Direct and Scholar Google. Moreover, the policies and regulations are found in Google and Scholar Google. The results found that there is no role model and representative of green hospitals in Indonesia to lead other hospitals. The limited collaboration between stakeholders is also an issue. The conclusion includes the preparedness of the government to seriously implement the green hospital.

Keywords: Green Hospital; Policy; Regulation; Indonesia.

Introduction

Implementing green initiatives in hospitals is essential for reducing the excessive use of scarce resources and promoting environmental sustainability (Vaishnavi & Suresh, 2022). Green hospitals aim to create eco-friendly operations that minimize environmental impact while providing a healthy environment for patients and staff (Han, 2020). Leading hospitals have already taken steps such as increasing energy efficiency, recycling, eliminating hazardous products, and adopting sustainable practices in their operations (Aljohani, 2023). Building a Green Hospital Model is crucial for aligning healthcare facilities with sustainable development goals (Hien, 2021). Such models focus on integrating green practices into hospital operations, including policy development and creating a green health ecosystem. Studies have shown that implementing green strategies in the hospitality industry, such as green technology practices, not only benefits the environment but also leads to improved customer satisfaction and loyalty (Songur et al., 2022; Soni et al., 2022).

Implementing green initiatives in hospitals in Western countries is a crucial step towards promoting environmental sustainability and enhancing healthcare services. The concept of green hospitals involves integrating eco-friendly practices into healthcare facilities to reduce environmental impact and improve overall efficiency (Lee & Lee, 2022). Studies have highlighted the importance of developing green healthcare activities within the framework of total quality management to ensure sustainable practices are implemented effectively (Lee & Lee, 2022). In Western countries, the movement towards green hospital development has gained momentum over the years, with several countries introducing green rating systems for hospital buildings (Sahamir et al., 2019). The implementation of green public procurement in hospitals has also been recommended to guide the integration of sustainable practices in healthcare facilities (Puspitasari et al., 2022). Furthermore, the role

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of green accounting in public hospitals has been emphasized as a means to promote environmental sustainability and community welfare through improved waste management and accountability (Ashari & Anggoro, 2021).

While the focus on green initiatives in hospitals is increasing, challenges persist in achieving widespread implementation. Empirical studies have shown that implementing lean healthcare practices, aimed at improving process management and quality assurance, remains localized with limited success (Hallam & Contreras, 2018). Additionally, the adoption of green technology and green electricity plays a significant role in enhancing ecological balance in Western European countries, highlighting the importance of innovation in promoting environmental sustainability (Oyebanji & Kirikkaleli, 2022).

Hospitals as public places need to implement the green concept which is supposed to be convenient for staff, patients, and the environment. However, there are challenges at every level, such as at the national level and implementation at the regional level. In Indonesia, there are a limited number of pilot hospitals as the representatives of green hospitals. This study aimed to review existing literature about green hospitals worldwide and discuss green hospital implementation in Indonesia and regulation.

Method

This review was carried out the studies from the ScienceDirect database and Scholar Google. For Science Direct, the terms used include: "green" AND "hospital" AND "concept". The inclusion criteria include the study from 2022 to 2024 to have the updated articles and the articles published in full-text, open access, and in English. The literature search was conducted in March 2024 to explore the present situation of green hospitals. The search strategies did not limit the country of origin. The total number of articles found was 12. Then the selection process is reading the title and abstract to ensure the relevancies studies with the topic in the current study. The final four studies were carried out to be analyzed.

Scholar Google is used to find the literature from the Indonesian context. The terms used are "green" AND "hospital" AND "Indonesia". There is no limited year of publication but language. Finally, totally three articles from the Indonesian context were discussed in this study. Moreover, the policies and regulations related to the green hospital concept were retrieved from Google and Scholar Google.

This study discussed the implementation of the green hospital concept in some countries abroad and Indonesia. Furthermore, the policy review was discussed to be more detailed describing the concepts and which stakeholders might be involved.

Result and Discussion

The results of this study discuss the implementation of green hospital concepts from 7 articles. The articles are from several countries, such as Saudi Arabia, France, Cameroon, India, and Indonesia. The year of publication was from 2022 to 2024 but the journal articles from Indonesia there is no limited year. Table 1 below describes the general characteristics of the articles selected. All of the articles discussed Green Hospital, however from different points of view and several aspects in specific. For instance, a study from Saudi Arabia discussed the aspect of the green hospital from surgery aspect during the COVID-19 pandemic. The study in Cameroon more specifically describes the implementation of using solar energy to supply electricity. The study in France elaborates on the impact of green hospital implementation on climate change. The study in India emphasized the concept of green hospitals including systems of green building, energy efficiency, and water efficiency.

Implementing green initiatives in hospitals in developing countries is crucial for promoting environmental sustainability and improving healthcare services. The integration of practices such as Just-in-Time (JIT), Total Quality Management (TQM), and green supply chain management can lead to enhanced environmental performance in healthcare facilities Green et al. (2019). Sustainability is increasingly becoming a significant target in the evolving healthcare landscape, emphasizing the importance of incorporating eco-friendly practices (Molero et al., 2021).

Implementing green hospital policies has a significant impact on various aspects of healthcare facilities. Studies have shown that green hospital policies influence employees' energy-saving behavior by affecting their attitudes, subjective norms, and perceived behavioral control (Asmawati, 2024). Green hospitals play a crucial role in enhancing patient satisfaction, improving the hospital environment, and reducing the negative environmental impacts (Rouhifard et al., 2022). These initiatives are essential not only for environmental sustainability but also for improving the quality of life for all stakeholders involved (Abdullah et al., 2018).

The growing awareness of climate change and advancements in AI technologies are driving the exponential growth of green hospitals (Rovira-Simón et al., 2022). However, challenges exist, as seen in the investigation of barriers to implementing green practices in Nigerian public hospitals, emphasizing the need for

policy solutions to promote green building initiatives (Ebekozien et al., 2021). Strategic planning and implementation of green healthcare activities within the Total Quality Management framework are crucial for the overall success of green initiatives in hospitals (Lee & Lee, 2022).

Furthermore, the promotion of environmental management in the health sector, as demonstrated in South Korea, highlights the importance of stakeholder engagement and the use of evaluation criteria to drive green management practices (Kim et al., 2018). Understanding critical factors and adopting a proactive approach to green supply chain management in healthcare settings are vital for successful implementation (Bentahar et al., 2022). The integration of green policies in hospitals is essential for sustainable development. While general principles guide sustainable actions, specific strategies tailored to each hospital's economic, social, and environmental context are crucial for effective green initiatives (Rodriǵuez et al., 2019). By fostering a culture of green behavior, implementing green HRM practices, and investing in green features, hospitals can contribute significantly to environmental sustainability and improve overall healthcare quality and performance (Hameed et al., 2020; Khan et al., 2022; Oyewole et al., 2019).

Table 1. The general information from the pieces of literature

Author	Objective	Context	Method	Result
AlShareef, Yasir, et al (2022) Saudi Arabia	To explore if assigning the green hospital to ensure safe and continuous resumption of surgical services during COVID-19. (AlShareef et al., 2022)	Green hospital Surgery	Multicenter and national quasi-experimental with post-test for control group design.	Green hospitals contributed to reducing the surgical backlog by a median percentage of 74% (38, 108) in Alqurayat, 25% (21, 26) in Tabuk, 8% (7, 9) in Haill, 81% (54, 91) in Al Jawf and 78% (72, 88) in Northern Borders. While in the control hospital was 8% (8, 9). Implementing elective surgeries in green hospitals contributes to a continuous resumption of surgical services during the COVID-19 pandemic.
Ngoh, Simon Kaomi, et al (2022) Cameroon	To design and simulate for rural areas isolated from the electricity grid, a system based on solar energy for the optimal supply of green electricity and medical oxygen to a hospital. (Koumi Ngoh et al., 2022)	Green hospital Electricity Rural area	The simulations are implemented. The system sized to produce 20 Nm 3 /day is constituted of a 37.46 kW photovoltaic farm, a 15.47 kW electrolyzer, and a 15.47 kW fuel cell. The simulation of the Photovoltaic system is performed using the single diode model solved with the Lambert function defined in MATLAB Software.	The daily production of oxygen and hydrogen during the sunniest day of the month is respectively 20.81 Nm 3 /day and 41.61 Nm 3 /day. The daily energy that can be stored is relevant to hydrogen production and an electricity storage capacity of 124.89 kWh is feasible. During the last sunny day of the least sunny month, the daily production of oxygen and hydrogen is respectively, 7.72 Nm 3 /day and 15.44 Nm 3 /day. The recorded values prove that the system size can constitute a viable solution to ensure the permanent supply a green electricity and oxygen to the hospital with good energy storage capacity.
Vallee, Alexandre (2024) France	To explore the profound impact of climate change on health, projecting an additional 250,000 annual deaths from various climate-related diseases between 2030 and 2050. (Vallée, 2024)	Green hospital Climate change	The concept of the "Green Hospital" is introduced as a paradigm shift in healthcare, focusing on optimizing resource efficiency and minimizing environmental impact. This concept encompasses renewable energy integration, natural lighting, sustainable materials, green roofs, and smart building management systems.	Several challenges remain major, such as medical waste management, water conservation, chemical use, pollution, and plastic usage in healthcare settings. Moreover, obstacles to green hospital initiatives should be resolved, including system redundancy, regulatory compliance, operational demands, financial constraints, and cultural resistance. Conclusively, an urgent reformation of healthcare systems is needed to align with eco-friendly and sustainable practices, highlighting the necessity to reduce CO2 emissions and manage resources and waste more effectively to meet the evolving health

Author	Objective	Context	Method	Result
				needs of a growing and aging global population.
Tarkar, Preeti (2022) India	To know the concept of a "green hospital" (Tarkar, 2022)	Green hospital Concept	The site of reputable domestic and foreign institutional electronic databases was searched to identify the patterns of green hospitals. Thus, the data for this study was collected from the multiple online sources.	It is found that there are various rating systems for the green buildings i.e., Green Rating for Integrated Habitat Assessment (GRIHA), Indian Green Building Council (IGBC), Bureau of Energy Efficiency (BEE): Star Rating, ASSOCHAM GEM, ECBC Compliance etc. Overlap in terms of energy efficiency, water efficiency, and waste management patterns were observed in all other aspects could be due to differences in location patterns and different organizations providing organizations needs to be mentioned. There are several constraints are also available for constructing green hospitals.
Sutanto, et al (2019) Indonesia	to formulate and determine the priority of hospital environmental management strategies towards green hospitals in Indonesia (Sutanto et al., 2020)	Green hospital Management strategy	The type of data needed in the study of hospital environmental management strategies towards green hospitals in Indonesia is the type of primary data obtained from the results of filling out the questionnaire by respondents. The respondents are 7 experts.	The results showed that the main priority of the hospital environmental management strategy towards green hospitals in Indonesia was the strategy of preparing a road map-grand design for green hospitals.
Amelia, Safiera and Ilyas, Jaslis (2023) Indonesia	To analyze the differentiation of implementation of GBCI between 2 hospitals in Indonesia. (Amelia & Ilyas, 2023)	Green hospital GBCI (Green Building Council Indonesia)	This study used a narrative review to explore grey literature based on inclusion criteria. Two hospitals in this study are RSUD Embung Fatimah Batam in 2017 and RS PON Prof. Dr. dr. Mahar Mardjono in 2021.	The results show that the application of the Energy Efficiency and Conservation category at Prof. PON Hospital. Dr. Dr. Mahar Mardjono (62.5%) is better than RSUD Embung Fatimah Batam (31.3%), the implementation of the Water Conservation category at RSUD Embung Fatimah Batam (50%) is better than RS PON Prof. Dr. Dr. Mahar Mardjono (35%) and implementation of the Indoor Health and Comfort category at Prof. PON Hospital. Dr. Dr. Mahar Mardjono (30.8%) and RSUD Embung Fatimah Batam (23.1%) still need more attention because the achievement percentage is still below 50%.
Marshall, N, M, Octavianus, et al (2021) Indonesia	to compare the implementation of green hospitals in various hospitals in Indonesia. (Marshal et al., 2021)	Green hospital Comparative	The comparisons will be taken from the elements of a green hospital, namely energy efficiency, green building design, alternative energy generation, transportation, food, water, and the availability of green open space. This research type is a literature review, with data taken from an online database. The online databases used are Science Direct and Google Scholar.	12 studies matched the inclusion criteria. It can be seen that there are various efforts by hospitals in Indonesia to implement green hospitals. However, there is unpreparedness in the application of all of its elements, especially in the transportation and food elements.

In Indonesia's context, the implementation of green hospital concepts was regulated by the Ministry of Health. Ministry of Health Indonesia established the guidelines for green hospitals and policy from Ministry of Health regulation Number 14 in Year 2021 about buildings, facilities, and medical devices in the hospital. The references described some criteria that need to be met by the hospital, including the main principles of a green hospital, the orientation of physical facilities, and the principles of standard building. According to the main principle of Green Hospital, there are five principles as the hospital has to design the building that guarantees the safety and security of patients in all areas by using construction materials that can reduce noise, nontoxic with well-air circulation and lighting. Moreover, construction design has to prioritize the easy handling of infection and prepare the emergency conditions. For the flow of the process, it mentioned that all medical staff, general staff, patients, and family have to be easy to follow the flow. The hospital building has to be flexible and fit for science improvement and medical technology. Green Hospital's principal has to implement the saving energy and environmentally friendly for design and construction.

According to physical facilities in the hospital building, some orientations have to be addressed. The orientation includes safety, patient-centeredness, efficiency, timeliness, and effectiveness. For safety, the design has to prevent injury by using a good air circulation system to prevent the spreading of infection, using easy cleaning materials, disinfection facility, and interconnection between the rooms. In terms of patient-centeredness, there are some points required such as differentiation between the area or zone, class of room to guarantee the comfortableness of patients and visitors, and easy to get information and access. About the efficiency, it mentioned the room operation, logistic services, and placement of the medical devices to minimize the injury due to unsafety patient mobilization. Timeliness refers to response time which consists of distance and access, minimizing the barriers of patient mobilization, and facility for mobilizing the services. In terms of the effectiveness, it was pointed out about the lighting quality, natural lighting, and noise handling.

The principles of standard building in a hospital refer to location, block plan, building layout, space utilization, building period, spatial design, building components, and land and building access. In detail, this regulation regulated some points in Table 2.

Table 2. The standard principle of the hospital building

Aspect	Criteria
Location	1. Not located in a dangerous area, prone to disasters, aircraft take-off/landing routes, transmitting stations, or steep contours. 2. Transportation road infrastructure is available. 3. Available public utilities (clean water, city drainage, communication lines).
Block plan	1. The designation and intensity of the building are by regional regulations 2. Meet the requirements for building density, building height, and building clearance 3. Fill the flood barrier
Building layout	Rearranging the zoning of health facility building blocks by strengthening: 1. minimizing the risk of disease transmission 2. level of privacy of service rooms 3. close functional relationships between service rooms à shortening distance and response time
Space utilization	1. Effective and efficient according to the service function. 2. Clear separation between infectious and non-infectious patients
Building period	The mass of the building supports air circulation (for dilution purposes) and natural lighting: 1. The building mass is not bulky (bulky mass) 2. The building design takes into account the orientation of the sun
Spatial design and building components	1. The design minimizes the risk of spreading infection by arranging the distance between seats in the waiting room, the distance between beds, spatial layout with zoning, air conditioning system, nonporous building materials, etc. 2. The design pays attention to the flow/ movement of staff, patients, and goods à no crossing.
Land and building access	1. The land and hospital building must be in one unified location. 2. The building site must have a fence and clear access 3. At least there is main access, emergency services emergency and servicing. 4. The main access/door must be visible. 5. The emergency service access/door must be easy to access & have characteristics. 6. Access/service door must be close to the service area.

Source: Minister of Health Regulation No. 14 of 2021 concerning Standards for Business Activities and Products in the Implementation of Risk-Based Business Licensing in the Health Sector

Table 3 shows the policies and regulations related to the implementation of green hospitals. It showed that the responsibility for the Green Hospital not only belongs to the Ministry of Health but also to other ministries and departments (Jaya, 2022; Ministry of Health Indonesia, 2018, 2021). In detail, the regulations include:

Table 3. The policies and regulations related to green hospitals in Indonesia

Regulations	About
Law no. 36 of 2009	Health
Law no. 32 of 2009	Protection and Management Environment Life
Law no. 44 of 2009	House Sick
Constitution Number 28 of 2002	Building,
Constitution Number 30 of 2007	Energy,
Constitution Number 18 of 2008	Management Rubbish
Constitution Number 25 of 2009	Service Public
Regulation Republic of Indonesia Government Number 82 of 2001	Management of Water Quality and Control of Water pollution,
Regulation Republic of Indonesia Government Number 70 of 2009	Conservation Energy,
Regulation Republic of Indonesia Government Number 101 of 2014	Management Waste Material Dangerous and Toxic
Instructions President Number 13 of 2011	Savings Energy and Water
Minister of Health Regulation Number 2306 of 2011	Infrastructure Technical Requirements Installation Electrical House Sick,
Regulation of the Minister of State for the Environment Life Number 08 of 2010	Criteria and Certification Environmentally Friendly Building
Minister of Public Works Regulation Number 30/PRT/M/2006	Technical Guidelines for Facilities and Accessibility in Buildings and the Environment
Minister of Public Works Regulation Number 5/PRT/M/2008	Green Open Space (RTH),
PUPR Ministerial Regulation Number 02/PRT/M/2015	Green Building
Minister of Environment and Forestry Regulation Number P. 56 of 2015	Procedures and Requirements Management Waste at Health Facilities
Minister of Energy and Mineral Resources Regulation Number 13 of 2012	Savings Electric Power Usage
Minister of Energy and Mineral Resources Regulation Number 14 of 2012	Management Energy
Minister of Energy and Mineral Resources Regulation Number 15 of 2012	Savings Groundwater Use
Decree of the Minister of Health Number 1204/Menkes/SK/X/2004	Environmental Health Requirements House Sick,
National Accreditation Standards House Sick Edition 1	
Guidelines Application Device Evaluation Green Building Greenship Existing Building Version 1.0 published 2011 from Council Indonesian Green Building (Green Building Council Indonesia),	
Guidelines Application Device Evaluation Green Building Greenship New Building Version 1.2 was published in 2014 by the Council Indonesian Green Building (Green Building Council Indonesia).	
Regulation No. 14 of 2021	Standard Business Activities and Products in Implementation Licensing Try Based Risk Health Sector.
Regulation No. 40 of 2022	Technical Requirements for Buildings, Infrastructure, and Home Health Equipment Sick

Source: The guideline of green hospital in Indonesia (Ministry of Health Indonesia, 2018)

The result of this study revealed that the study about green hospitals is various in terms of the point of view. However, one study focused on the concept of green hospitals which referred to some criteria. Another study only focused on one aspect of green hospitals, for example, the efficiency of electricity used.

Implementing green initiatives in hospitals in Indonesia faces challenges despite the country's efforts to improve healthcare infrastructure and services. The slow implementation of green buildings and construction projects in Indonesia hinders the progress toward eco-friendly healthcare facilities (Susanto & Sujana, 2023; Wijayaningtyas et al., 2023). Additionally, the readiness and resiliency of hospitals in Indonesia, as assessed by the Hospital Safety Index, indicate areas that need improvement to enhance environmental sustainability (Sunindijo et al., 2019). While the Indonesian government aims to ramp up the country's healthcare capacity, there is a need to focus on green hospital implementation to align with global sustainability goals (Mahendradhata et al., 2021). Studies have shown that factors such as foreign

ownership can moderate corporate social responsibility activities but may not directly impact the implementation of green practices in the hospitality industry in Indonesia (Ekowati et al., 2023). Furthermore, the literature review on green hospital implementation in Indonesia highlights the essential elements and criteria necessary for successful adoption (Marshal et al., 2021). The concept of green accounting in public hospitals in Indonesia demonstrates the potential for environmental sustainability and community welfare through improved waste management and accountability (Ashari & Anggoro, 2021). Legal policies and regulations play a crucial role in promoting green economy practices in various sectors, including healthcare and tourism, to achieve sustainable development goals (Nugroho et al., 2023; Yani, 2023). Recommendations for green public procurement in hospitals can further guide the integration of sustainable practices in healthcare facilities (Puspitasari et al., 2022).

Developing countries face challenges in monitoring universal health coverage within the Sustainable Development Goals, highlighting the need for effective strategies to ensure essential health services are provided (Hogan et al., 2018). Strategies for modernizing primary care nursing in developing countries recognize the diverse challenges faced in establishing an effective healthcare workforce based on specific contextual factors (Bryar et al., 2023). Environmental knowledge and awareness play a crucial role in promoting green technology initiatives and encouraging the adoption of eco-friendly practices in emerging countries (Mohiuddin et al., 2018).

Assessing the carbon footprints of healthcare systems in developing countries provides insights into potential leverage points for reducing environmental impact both within and outside the health sector (Pichler et al., 2019). Evaluating the progress of Asian countries toward green economy initiatives underscores the importance of sustainable development and its implications for public health (Shao et al., 2022). Addressing healthcare accessibility challenges in rural areas of developing countries is essential to ensure equitable access to healthcare services (Chowdhury & Ravi, 2022).

Strategic leadership and management factors are key drivers of sustainability in healthcare organizations in developing countries, offering managerial insights to enhance performance outcomes toward sustainable healthcare (Suriyankietkaew & Kungwanpongpun, 2021). Leveraging fintech and boosting sustainability in the healthcare sector can improve financial performance without compromising social and natural capital, contributing to long-term sustainability goals (Li et al., 2021). Integrating sustainable healthcare practices into health professions education through faculty development and student partnerships is essential to address the impacts of global environmental changes (Tun & Wellbery, 2020).

The regulation of green building laws in Indonesia plays a crucial role in achieving sustainable buildings, with a focus on formulating ideal concepts within the legal framework (Putra & Alfieta, 2022). Consumer protection against misleading "greenwashing" marketing practices in Indonesia lacks specific regulations, highlighting the urgency for appropriate legislation (Irawati, 2023). Green bonds are identified as a promising financial mechanism in Indonesia, offering a structured framework and regulations to support environmental sustainability and finance green projects (Kusmayadi & Koestoer, 2022).

To establish the concept of green hospitals in Indonesia, it is essential to consider various aspects such as sustainable energy management, efficient environmental practices, and regulatory frameworks. The implementation of green hospitals in Indonesia involves redefining medical facilities to prioritize human health while minimizing environmental impact (Alkaabi & Aljaradin, 2023). Efforts to integrate sustainable energy management practices in hospital buildings are crucial for ensuring the continuity of health services while reducing the environmental footprint (Annura et al., 2022).

Regulations play a significant role in shaping the development of green hospitals in Indonesia. The formulation of green building laws and regulations is essential for realizing sustainable buildings and ensuring compliance with environmental standards (Putra & Alfieta, 2022). Additionally, the assessment of the sustainability of hospital environmental management towards green hospitals emphasizes the importance of minimizing negative contributions to global warming through effective environmental management practice (Sutanto et al., 2020).

Furthermore, the implementation of green procurement practices in hospitals can contribute to the sustainability of healthcare facilities in Indonesia. By selecting suppliers who prioritize environmental concerns, hospitals can align their operations with green principles and promote eco-friendly practices throughout the supply chain (Pujotomo et al., 2018). The concept of green hospitals in Indonesia is part of a broader movement towards sustainable development, emphasizing the importance of environmental responsibility in healthcare operations.

The establishment of green hospitals in Indonesia encounters various challenges that must be addressed to advance environmental sustainability in healthcare facilities. Insights from studies on barriers to implementing green practices in different sectors can be

valuable in understanding the challenges faced in setting up green hospitals in Indonesia.

A study by Singh et al. (2020) examines the barriers to Green Lean practices in manufacturing industries, underscoring the necessity of capable leadership for the effective implementation of green initiatives (Singh & Singh, 2020). This underscores the crucial role of leadership in promoting sustainable practices within organizations, including hospitals. Furthermore, one study delves into the factors and obstacles in implementing Building Information Modelling (BIM) in green construction in Indonesia, shedding light on the challenges encountered in adopting advanced technologies for sustainable construction projects (Susanti et al., 2023). Understanding these barriers can offer valuable insights into the technological hurdles that may arise in implementing green initiatives in hospital construction. Moreover, another study explores the barriers to green building implementation in the Malaysian construction industry, providing insights into the challenges faced in promoting sustainable construction practices (Wong et al., 2021). This study could offer comparative insights that are pertinent to the Indonesian context. By examining the barriers and challenges identified in these studies, stakeholders involved in establishing green hospitals in Indonesia can enhance their understanding of the obstacles that need to be surmounted. Addressing issues such as leadership, technological adoption, and industry-specific challenges can facilitate the successful establishment of green hospitals in Indonesia, thereby contributing to environmental sustainability in the healthcare sector.
Some hospitals already implemented green hospital concepts in Indonesia. However, there are some barriers at any level. Adopting the concept of green hospitals from other countries could solve the barriers. Future research can include the specific aspects of green hospitals and qualitatively explore the readiness of related stakeholders.

Conclusion

In conclusion, the adoption of green hospital practices from other countries is essential for advancing environmental sustainability, improving healthcare accessibility, and enhancing overall healthcare quality. By implementing eco-friendly initiatives, the government can work towards achieving sustainable healthcare systems that benefit both the environment and the community. The establishment of green hospitals in Indonesia requires a holistic approach that encompasses energy efficiency, environmental management, regulatory compliance, and sustainable procurement practices. By integrating green concepts into hospital operations and infrastructure, Indonesia can advance towards environmentally friendly healthcare facilities that prioritize both human health and environmental sustainability. while Indonesia faces challenges in implementing green initiatives in hospitals, there is a growing awareness of the importance of environmental sustainability in the healthcare sector. By addressing barriers, enhancing regulations, and promoting green practices, Indonesia can move towards establishing eco-friendly and sustainable healthcare facilities that benefit both the environment and the community.

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