CHALLENGES AND OPPORTUNITIES TO THE SUCCESS OF ENVIRONMENTAL HEALTH ASSESSMENTS IN HEALTHCARE FACILITIES UNDER THE BANGKOK GREEN & CLEAN HOSPITAL PLUS (BKKGC+) PROGRAM AT TAKSIN HOSPITAL OF THE MEDICAL SERVICE DEPARTMENT BANGKOK

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Abstract

The Bangkok Green & Clean Hospital Plus (BKKGC+) standard serves as a strategic initiative to improve environmental health management in hospitals under the Bangkok Metropolitan Administration. This study aimed to explore the challenges and opportunities related to BKKGC+ implementation using a qualitative approach. In-depth interviews were conducted with stakeholders in selected hospitals, and data were analyzed through a content-based framework focusing on four key dimensions: organizational strengths, internal challenges, external opportunities, and strategic directions. Findings indicate that while organizations possess internal strengths—such as leadership commitment, digital systems, and staff awareness—several barriers remain. These include high staff turnover, weak internal communication, outdated infrastructure, and the perception of BKKGC+ as an additional burden. The analysis draws upon the Resource-Based View (RBV) to highlight the value of internal capabilities, while the Theory of Planned Behavior (TPB) explains how attitudes, social influence, and perceived behavioral control affect staff participation. Furthermore, SWOT analysis identified external opportunities such as supportive policy, technological innovation, and rising societal concern for sustainability. The study recommends a dual strategy: strengthening internal systems through structured training, monitoring tools, and cultural integration, while leveraging external networks and policy support. Embedding BKKGC+ into routine hospital operations and quality systems like 5S or IC is essential to ensure long-term sustainability.

Keywords: Challenges, Opportunities, Environmental Health Assessments

Introduction

Environmental issues have become one of the most critical and urgent concerns both locally and globally. Climate change, air, water, and waste pollution significantly affect public health and overall quality of life. Healthcare facilities, as providers of public health services, play a crucial role in safeguarding people's health. However, their operations also contribute to environmental degradation, such as excessive resource consumption, hazardous waste generation, and emissions of air and water pollutants. Data shows that many healthcare facilities, especially those in major urban areas, face challenges in managing resources and

waste generated on-site. The use of energy, waste disposal, and chemical emissions in medical procedures make environmental health management in hospitals an urgent priority.

In response, the Bangkok GREEN & CLEAN Hospital Plus (BKKGC+) assessment was introduced by the Bangkok Metropolitan Administration's public health authorities to promote environmental health standards in healthcare facilities across Bangkok. The program aims to make Bangkok hospitals models of environmentally friendly and sustainable practices through an assessment process that evaluates various aspects such as waste management, energy conservation, wastewater treatment, and pollution control. Although BKKGC+ is well-structured and supported by policy, actual success depends not only on having the right policies or technologies in place but also on the participation of all sectors within the facility.

The BKKGC+ standard includes evaluation levels of Diamond, Gold, and Silver. Each year, hospitals apply for assessment and receive certification at various levels. Statistical trends show a significant decline in the number of hospitals passing certification: 35 hospitals were certified in 2022, but by 2024, the number had dropped to only 9. This may reflect the increasing stringency of the evaluation criteria.

Taksin Hospital is one such facility that places importance on environmental health standards. It joined the BKKGC+ program, which aims to enhance environmental health standards in hospitals. In 2022, Taksin Hospital underwent BKKGC+ assessment but did not pass, indicating the challenges it faced in aligning with the criteria. However, the hospital's team and administrators analyzed the evaluation results and systematically implemented improvements. By 2024, Taksin Hospital achieved BKKGC+ certification at the Gold level, reflecting its success in environmental improvement.

Therefore, this research on "Challenges and Opportunities for Success in Environmental Health Assessment under the Bangkok GREEN & CLEAN Hospital Plus (BKKGC+) Program" is significant in identifying the factors influencing successful environmental health assessments. The study helps to understand how hospitals can succeed in environmental conservation and serves as a guideline for improving and achieving higher certification. Additionally, it can support the formulation of environmental policy directions, contributing to a sustainable healthcare system and reducing negative environmental impacts in the long term.

Research Objectives

1. To explore the challenges and opportunities that influence the success of environmental health assessments in healthcare facilities under the Bangkok GREEN & CLEAN Hospital Plus (BKKGC+) program.

Scope of the Research

1. Population Scope

   Members of the Safety, Occupational Health, and Environment Committee are involved in BKKGC+ implementation.

2. Variable Scope

   Organizational strengths, challenges, external opportunities, and strategic directions related to BKKGC+.

3. Time Scope

   January – June 2025

Literature Review

Resource-Based View (RBV)

Barney (1991) proposed a strategic theory that emphasizes the importance of resources and organizational capabilities as the main factors in creating a competitive advantage. This concept views that organizations which can possess and utilize unique resources will be able to create differentiation and sustainable competitive advantage. The core concepts focus on:

Valuable – Resources must help the organization create added value or increase work efficiency. Rare – Resources that are not easily found or are difficult for competitors to possess.

Imperfectly imitable – Resources that are complex to produce or costly to imitate. Organized to Capture Value – There must be management systems to create value; the organization must have structures and management systems that can fully utilize these resources efficiently. Types of resources include tangible resources such as financial capital, buildings, machinery, equipment, etc., and intangible resources such as organizational reputation, employee expertise, organizational culture, advanced technology, etc.

SWOT Analysis Concept

Kotler & Armstrong (2018; Gurel & Tat, 2017) SWOT analysis is widely attributed to Albert Humphrey, who defined SWOT Analysis as a tool for assessing situations for organizations or projects, which helps executives identify strengths and weaknesses from the internal environment, as well as opportunities and threats from the external environment, including the potential impacts of these factors on the organization's operations. Components of SWOT Analysis: Strengths – Internal factors that provide a competitive advantage to the organization, which may include brand reputation, technology, or skilled personnel. Weaknesses – Internal factors that may cause limitations or obstacles to the organization, such as organizational structure problems, limited resources, or lower performance compared to competitors. Opportunities – External factors that the organization can leverage for growth, such as market changes, new technologies, or beneficial regulations. Threats – External factors that may negatively affect the organization, such as economic recessions, intense competition, or stricter laws.

Theory of Planned Behavior

Ajzen (1991) explained that human behavior does not occur independently. It is a psychological model that describes how an individual's behavior is determined by their intentions. This theory serves as a framework to define the relationships among various variables and is widely accepted for studying attitudes and the influence of attitudes on behavioral change. It is influenced by three main factors: Attitude – Arises from behavioral beliefs about the possible outcomes of the behavior. It reflects an individual's evaluation of a particular behavior based on their belief about the likely results. If a person believes that performing a certain behavior will lead to positive outcomes, they are likely to form a favorable attitude toward that behavior. Subjective Norms – Arise from an individual's normative beliefs about the social expectations or norms. This refers to a person's assessment of information received from others in society, particularly those whom they respect, trust, or are close to. If those significant individuals perform a certain behavior, the person is likely to follow and imitate that behavior due to social influence. Perceived Behavioral Control – Arises from control beliefs, or an individual's perception of factors that may facilitate or hinder the performance of the behavior. It involves evaluating how difficult or easy it is to perform the behavior under certain conditions. If an individual perceives that they have sufficient internal resources or conditions to support the behavior, they are more likely to intend to perform it.

Environmental Health Assessment in Healthcare Facilities under the Bangkok GREEN & CLEAN Hospital Plus (BKKGC+) Program

The Urban Health Development Institute, in collaboration with the Medical Services Department of the Bangkok Metropolitan Administration (BMA), has promoted the development of environmental health practices that support urban population well-being. The initiative aims to enhance the environmental health standards in hospitals through various activities such as waste management, restroom sanitation, energy conservation, environmental and sanitation management of food and water, and the development of healthcare innovations. The ultimate goal is to improve the quality of life of patients and strengthen urban communities toward sustainable well-being within a supportive living environment.

The BKKGC+ assessment consists of nine categories:
CLEAN – Creating a Development Process
G: GARBAGE – Management of All Types of Waste
R: RESTROOM – Management of Public Restrooms
E: ENERGY – Energy Management
E: ENVIRONMENT – Environmental Management within the Hospital
N: NUTRITION – Food and Water Sanitation
Innovation – Development of GREEN Innovations and Research
Network – Building GREEN Development Networks
Carbon Footprint – Calculating Greenhouse Gas Emissions

BKKGC+ Evaluation Levels

The assessment is divided into three levels: Silver, Gold, and Diamond, with criteria as follows:

Silver Level - Focuses on basic access to proper environmental health management. Evaluation includes the development process using the CLEAN strategy and hospital activities under GREEN, such as infectious and hazardous waste management, general waste management, improvement of restrooms to meet HAS standards, energy and environmental management inside and outside the hospital, and food and water sanitation. Hospitals must complete categories 1–6 and category 8, with a total score of at least 125 points.

Gold Level - Emphasizes comprehensive environmental health management by adding activities that promote the implementation of GREEN innovations and creating development networks that extend GREEN activities to the community, forming a GREEN Community. It also includes calculating greenhouse gas emissions from products or organizational activities. All nine categories (1–9) must be completed, with a total score of at least 165 points.

Diamond Level - Focuses on high-quality management and the expansion of results through network building. It requires the implementation and application of GREEN innovations and community-level networking that results in the formation of a GREEN Community. The hospital must calculate the greenhouse gas emissions from various organizational products or activities. All nine categories (1–9) must be completed, with a total score of at least 190 points.

This research integrates the Resource-Based View (RBV), SWOT Analysis, and the Theory of Planned Behavior (TPB) to examine internal and external organizational factors, as well as staff behavior, that influence the successful implementation of the BKKGC+ environmental health standards.

Research Methodology

1. Research Methodology

This study adopts a qualitative research approach to explore the challenges and opportunities influencing the success of environmental health assessments under the Bangkok GREEN & CLEAN Hospital Plus (BKKGC+) standards.

2. Research Steps

The research process began with a review of relevant documents and research related to BKKGC+ standards, followed by the design of a structured in-depth interview tool. Participants were then selected based on predefined criteria, and in-depth interviews were conducted with those selected. The collected interview data were transcribed and analyzed using the constant comparison method to identify key themes and patterns. Summarize key insights and validate findings with participants (member checking)

3. Data Collection

Data were collected using a structured in-depth interview method. The participants included five members of the Safety, Occupational Health, and Environment Committee who held supervisory positions, selected from a total of 27 committee members (as per Taksin Hospital Order No. 322/2566, dated August 31, 2024). Interviews were conducted individually in a semi-structured format to encourage open and reflective responses.

4. Data Analysis

Interview data were coded and categorized into four main themes: organizational strengths, key challenges, external opportunities, and strategic directions. The data were then analyzed using the constant comparison method, with frequency tracking of recurring themes. Findings were validated through member checking to ensure accuracy and credibility

Research Results

Challenges and Opportunities for the Successful Implementation of BKKGC+

The implementation of the Bangkok Green & Clean Hospital Plus (BKKGC+) standard is a vital mechanism for enhancing the environmental health standards of healthcare facilities in a systematically and sustainably. However, a qualitative overview of participating organizations reveals four key dimensions for analysis: organizational strengths, key challenges, external opportunities, and strategic directions, as follows:

Organizational Strengths

The organization demonstrates a moderate level of readiness in terms of personnel, infrastructure, and supportive policies. Notably, staff exhibit environmental awareness and an understanding of relevant standards. The use of digital technology also supports data collection and performance monitoring processes. Furthermore, leadership plays a role in policy support and resource allocation, reflecting a positive attitude toward improving environmental quality within the hospital.

Key Challenges

Despite some enabling resources, the organization faces several constraints. These include frequent staff turnover, leading to a lack of continuity in operations and inconsistent understanding of the criteria. Existing workloads contribute to the perception that BKKGC+ implementation is an additional burden or secondary task. Inconsistent communication of policies and goals results in inadequate acceptance and participation in some departments. Infrastructure deficiencies, such as substandard restrooms or outdated wastewater treatment systems, and the lack of a systematic monitoring and evaluation system hinder sustainable improvement efforts.

External Opportunities

Support from policy-making bodies and external networks, such as local administrative organizations, the private sector, and non-governmental organizations, provides important reinforcement. Moreover, environmental issues have become national and global priorities, creating social pressures (Subjective Norms) that foster a stronger organizational culture of environmental responsibility. Modern technologies also reduce staff workloads and improve the accuracy of performance monitoring and evaluation.

Strategic Directions

From the overall analysis, the following strategic directions are recommended to enhance the success of BKKGC+ implementation: establishing a dedicated task force or responsible personnel to clarify roles and track progress; implementing a structured training and capacity-building system to deepen understanding of the criteria; adopting digital technology for management and monitoring to reduce redundant tasks; fostering organizational culture through proactive communication and public relations; and integrating BKKGC+ standards with routine work, such as 5S, infection control (IC), or other quality systems to ensure long-term sustainability.

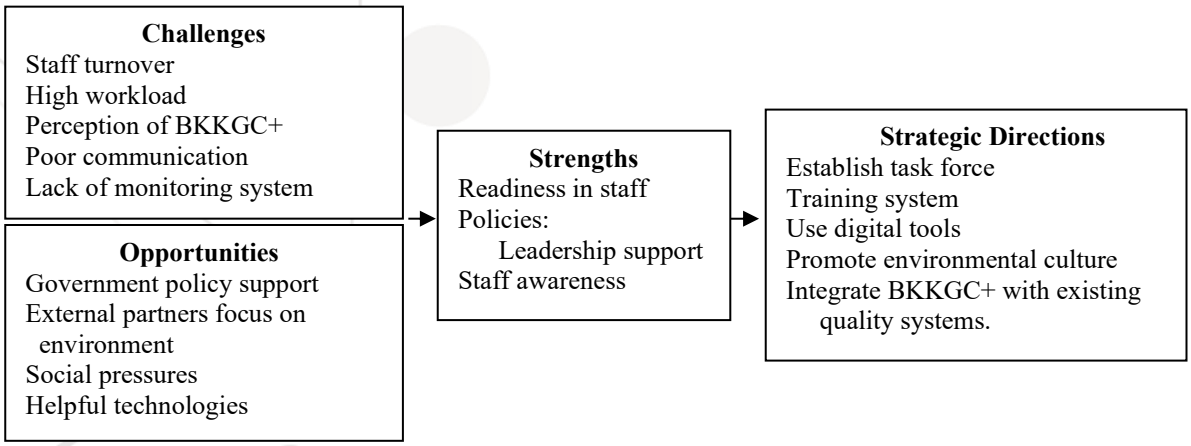

Figure 1: Framework of Challenges, Opportunities, Strengths, and Strategic Directions for BKKGC+

Discussion

The findings highlight the multifaceted nature of environmental health management in hospitals and underscore the importance of both internal and external factors in driving sustainable outcomes. Organizational strengths, such as committed leadership and digital support systems, align with the Resource-Based View (RBV), emphasizing the value of internal capabilities in achieving competitive advantage. Simultaneously, the Theory of Planned Behavior (TPB) provides a useful framework for understanding how attitudes, social norms, and perceived behavioral control influence staff engagement and participation. The challenges identified—particularly related to staff turnover, inconsistent communication, and infrastructure limitations—suggest the need for integrated policy and practice. These insights indicate that sustainability efforts should not only rely on the technical readiness of the hospital but also on behavioral and cultural transformation. External support and policy alignment serve as critical enablers, but without adequate internal reinforcement, the impact may be short-lived. Therefore, a dual strategy is necessary: one that strengthens internal resources and processes, while also leveraging external partnerships and systemic support. Future efforts should

consider embedding BKKGC+ within the organizational mission and performance metrics to ensure it is viewed as a core responsibility rather than an additional task. Ultimately, fostering a culture of environmental stewardship across all levels will be key to long-term success.

The study's findings confirm that environmental health management is shaped by complex internal and external dynamics. Internally, committed leadership and efficient systems reflect strategic resources aligned with the Resource-Based View (RBV), while staff attitudes and perceived control, as framed by the Theory of Planned Behavior (TPB), significantly influence engagement. Challenges such as staff turnover and communication gaps point to structural limitations that require targeted policies. These align with previous work by Geneletti, et al. (2015), who identified interdisciplinary strengths and communication value as internal assets, while noting external threats and inconsistent application as barriers. Likewise, O'Faircheallaigh (2010) emphasized the importance of linking environmental assessments to real-world governance and behavior, reinforcing that technical compliance alone is insufficient without institutional adaptation. Together, these perspectives support a dual approach—strengthening internal systems while leveraging external networks—to embed BKKGC+ as an integral part of hospital operations.

Recommendations

1. Recommendations for the application of research results

Hospitals implementing BKKGC+ should integrate its principles into core organizational strategy and daily operations. Strengthening internal leadership, improving communication systems, and maintaining continuity despite staff turnover are essential. Digital monitoring tools should be expanded to enhance real-time tracking and evaluation. Furthermore, fostering a culture of environmental responsibility at all organizational levels is necessary for long-term behavioral change. BKKGC+ should not be treated as a temporary project, but embedded in performance metrics and institutional identity.

2. Recommendations for future research

Future studies should explore comparative analysis across different hospital sizes and locations to identify shared and unique success factors in BKKGC+ implementation.

Research could also focus on the behavioral mechanisms driving staff engagement, using quantitative methods to validate key factors found in this qualitative study.

Longitudinal research is recommended to assess the sustained impact of BKKGC+ initiatives on both environmental quality and public health outcomes. Moreover, examining the role of external stakeholders and policy networks could offer insights into systemic enablers of environmental health management.

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