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# Exploring New Methods for Measuring Hospital Performance and Quality of Care for More Effective Strategic Planning: A Systematic Review

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## ABSTRACT

Measuring hospital performance and quality of care is crucial for strategic planning to improve patient outcomes. However, there is no consensus on the most effective measurement approach. To explore new methods for measuring hospital performance and quality of care and identify their use in strategic planning. A systematic literature review was conducted using Scopus and Semantic Scholar databases for studies published between 2019-2024. Innovative approaches identified include federated causal inference, comprehensive efficiency index, multidimensional quality assessments, balanced scorecard method, electronic clinical quality measures, and programmatic quality measures. These methods provide comprehensive performance data while addressing challenges like data privacy. New measurement methods can generate valuable data for strategic planning in hospitals. Implementation should be tailored to specific contexts and can lead to more effective planning and improved patient outcomes.

**Keywords:** Hospital Performance Measurement, Quality of Care Measurement, Strategic Planning

## INTRODUCTION

The hospital industry is constantly evolving, and effective methods for measuring hospital performance and quality of care are urgently required. Several studies have evaluated the effectiveness of hospital quality assessment programs in different countries. These studies provide important insights into how such programs can affect the healthcare quality and overall hospital performance. A deeper understanding of the impact of these programs can assist policy makers and hospital administrators in developing better strategies to improve healthcare quality.

Based on current understanding, various approaches have been implemented to evaluate hospital performance and quality of care, including patient satisfaction surveys,

clinical outcome assessments, and process measures. However, there remain a need for a more thorough and efficient methodology to provide a comprehensive perspective on the performance of healthcare facilities.

Effective measurement of hospital performance and quality of care is a multifaceted issue that has been addressed through various methodologies and frameworks. These methods highlight the relationship between health information technology (HIT) implementation and hospital quality improvement practices, showing that higher levels of HIT are associated with better performance in terms of mortality rates, patient satisfaction, and quality ratings by managers (Restuccia et al., 2012). There are several effective methodologies and frameworks for measuring hospital performance and quality of care based on a given context. The Donabedian model is a commonly used framework for evaluating healthcare quality. This model assesses three aspects: structure, process, and outcome ((Pramana & Ayuningtyas, 2023a). Structures include facilities and resources; processes include interactions between providers and patients, and outcomes focus on patient satisfaction and health outcomes.

SERVQUAL is a popular service quality measurement instrument, particularly in the service industry, including hospitals. This methodology measures the gap between customer expectations and perceptions of service quality (Tonjang & Thawesaengskulthai, 2024). Variations in SERVQUAL, such as SERVPERF, have also been used to measure actual service performance. Other service quality measurement models developed specifically for higher education but adaptable to hospitals include HEdPERF, HETQMEX, and SERVCESS. These models adapt the measurement dimensions to the specific context of an institution. Overall, the effective measurement of hospital performance and quality of care requires a comprehensive approach that considers multiple dimensions, such as safety, effectiveness, efficiency, timeliness, equity, and patient-centeredness. The use of an appropriate framework can help hospitals to identify areas of improvement and improve service quality in a sustainable manner.(Tonjang & Thawesaengskulthai, 2024)

The quality of health care provided by hospitals is an important factor in determining patient outcomes and overall public health. Therefore, it is imperative to develop reliable and effective methods to measure hospital performance and Quality of Care.

These methods often incorporate a combination of quantitative and qualitative measures, allowing for a more nuanced evaluation of hospital performance across multiple dimensions. Such comprehensive frameworks allow healthcare administrators and policymakers to identify areas of excellence and opportunities for improvements in healthcare institutions. By providing a more holistic view of hospital performance, these tools can drive highly effective strategic planning and foster a culture of continuous quality improvement in health care delivery.

Despite the availability of various methods to measure hospital performance and quality of care, there is still no consensus on the most effective methods for generating data that can be utilized for strategic planning. The current understanding of new methods for measuring hospital performance and quality of care is multifaceted and involves the assessment of multiple quality domains, technology integration, and effective teamwork. (Berkowitz et al., 2022) highlighted the importance of evaluating the quality of advance care planning (ACP) documentation across several domains, which is critical for improving patient care. Similarly, (Chakraborty et al., 2021) emphasized the role of technology integration (IT) and healthcare team effectiveness (HTE) in improving patient care quality (PCQ), suggesting that hospital leaders prioritize these aspects for better strategic planning. (Alotaibi et al., 2023) reviewed technological advances in pre-hospital emergency care and indicated that innovations can significantly improve patient outcomes and EMS efficiency.

However, this method is associated with uncertainties and other problems. (Berkowitz et al., 2022) acknowledged the lack of consensus in evaluating the quality of ACP documentation and the variety of strategies adopted, which may complicate the standardization of quality measures. (Moshood et al., 2024) and (Abu-AlSondos, 2023) highlighted the important role of information quality in strategic decision-making, implying that uncertainty in data quality may affect the performance of healthcare organisations.

In summary, while there is an understanding that technology integration, effective teamwork, and comprehensive quality assessments can improve hospital performance and quality of care, there is still uncertainty regarding the standardization of quality measures and the impact of data quality on strategic decision making. Therefore, effective strategic planning in hospitals must address these uncertainties by developing

an adaptable framework for quality assessment (Berkowitz et al., 2021) and emphasizing the importance of information quality in the decision-making process (Abu-AlSondos, 2023); (Moshood et al., 2024).

## THEORETICAL BASIS

Hospital performance and the quality of care are critical metrics in assessing healthcare systems worldwide. Traditional measures of hospital performance, such as mortality rates, patient satisfaction, and resource utilization, have long been the cornerstone of strategic planning in healthcare settings. However, these indicators alone may not comprehensively capture the complexity of healthcare delivery. In recent years, there has been a growing recognition that a more holistic approach is necessary to accurately assess hospital performance and quality of care. Theories such as Total Quality Management (TQM) and the Donabedian Model of healthcare quality provide frameworks for understanding the multidimensional nature of quality, encompassing not only clinical outcomes but also patient experience, organizational processes, and system efficiency.

With the rapid evolution of healthcare needs and technological advancements, measuring hospital performance has become more challenging. Traditional metrics often fail to incorporate the evolving expectations of patients and stakeholders, or the effects of digital health tools and innovative treatment methods. As a result, researchers and healthcare professionals are exploring new methods and models for performance measurement. New methodologies such as the Balanced Scorecard (BSC) and the Six Sigma approach have been introduced to assess hospital performance in a more integrated and strategic way, balancing financial, operational, and clinical perspectives. These newer approaches are particularly beneficial in aligning hospital objectives with broader healthcare goals, such as improving patient outcomes, enhancing service delivery, and promoting sustainable practices in hospital management.

In the context of strategic planning, accurate and reliable performance measurement is essential for setting realistic goals, allocating resources effectively, and improving decision-making processes. The exploration of new methods for measuring hospital performance and quality of care is therefore a critical area of inquiry. Systematic reviews of these new approaches allow for the identification of best

practices and emerging trends, helping healthcare leaders make informed choices about which metrics and frameworks best support their strategic goals. By adopting innovative and evidence-based methods for evaluating hospital performance, healthcare systems can move towards more efficient and patient-centered care delivery models, ultimately enhancing both the quality of care and patient satisfaction.

## METHOD

### Eligibility Criteria

The eligibility criteria for including or excluding papers in this systematic literature review (SLR) were as follows:

**Inclusion Criteria:**

1. Papers that focus on new methods for measuring hospital performance and quality of care
2. Papers that discuss how the data from these new measurement methods can be utilized for more effective strategic planning in healthcare organizations.
3. Papers published in peer-reviewed journals or conference proceedings
4. Papers published in 2019 - 2024

**Exclusion Criteria:**

1. Papers that did not focus on new measurement methods for hospital performance and quality of care
2. Papers that do not discuss the utilization of measurement data for strategic planning
3. Papers published in languages other than 2019-2024
4. Grey literature, such as reports, dissertations, and unpublished manuscripts

The characteristics of this study include the target population for this SLR being healthcare organizations, particularly hospitals, with outcomes centered on the effectiveness of new measurement methods and their strategic utilization. Although the review did not specify a particular study design or minimum follow-up duration, it may have included a range of research methodologies such as observational studies, experimental studies, and systematic reviews. By adhering to these criteria, the SLR aims to synthesize current knowledge on innovative performance measurement techniques and their strategic implications for hospitals and healthcare organizations.

**Information Sources**

To conduct this systematic literature review, we consulted multiple sources of information to identify relevant studies. The search process queried two primary databases: Semantic Scholar and Scopus. Both databases were accessed on September 6, 2024, ensuring that the most up-to-date research is captured. In addition to these database searches, the review methodology incorporated backward and forward citation searches for the included studies. This approach allowed for the identification of additional relevant research that may not have been captured in the initial database queries. By employing this comprehensive search strategy, this review aimed to gather a thorough and diverse collection of studies pertinent to the research question at hand.

**Search Strategy**

The search strategy employed a systematic approach to identify the relevant studies. Initially, a comprehensive search query was developed, incorporating keywords and Medical Subject Headings (MeSH) terms pertaining to hospital performance measurement, quality of care measurement, strategic planning, and strategic management. This query was then applied to the selected databases and registers in order to retrieve potentially relevant studies. The process continued with thorough screening of titles and abstracts to assess eligibility based on predetermined inclusion and exclusion criteria. Studies that met these criteria were subjected to a full-text review to further evaluate their suitability for inclusion. To ensure a comprehensive search, backward and forward citation searches were conducted on the included studies, to identify any additional relevant literature that may have been missed in the initial database search.

The search strategy employed a comprehensive approach across two databases, Scopus and Semantic Scholar. In Scopus, the search string focused on TITLE-ABS-KEY “(hospital performance measurement and strategic planning)”, “(hospital performance measurement and strategic management)”, “(hospital quality of care measurement and strategic planning)”, “(hospital quality of care measurement and strategic management)”

The search was refined using filters to include only articles and conference papers published in English and Indonesian between 2019 and 2024, focusing on the final

publication stage documents. The search was limited to the titles, abstracts, and keywords.

For Semantic Scholar, a similar strategy was adopted, using a search string focused on "hospital performance" OR "quality of care" AND "measurement" OR "metrics" AND "strategic planning.

The same publication date range and language filters were used. Both searches were designed to capture recent relevant research on hospital performance and its strategic implications. The number of results from each database was recorded and the search results were saved for subsequent screening and selection processes, ensuring a thorough and systematic approach to the literature review.

**Data Extraction**

The data collection process for this systematic literature review was conducted with meticulous attention to the details and adherence to rigorous methodological standards. Two independent reviewers extracted relevant information from each included report by using a predefined data extraction form to ensure consistency across all studies.

The reviewers worked autonomously and carefully reviewed the reports to gather necessary data. When discrepancies arose between the two reviewers' extracted information, they engaged in thorough discussions to reach consensus. In cases in which agreement could not be achieved, a third reviewer was brought in to arbitrate and make the final decision. To maintain the highest level of accuracy, the extracted data were diligently cross-checked against original reports. In instances where information was missing or unclear, the research team made concerted efforts to contact the study authors directly by, sending at least two email requests before deeming unavailable data.

Importantly, the entire data extraction process was conducted manually without the use of automation tools to ensure a nuanced and context-sensitive approach. The use of a standardized data extraction form further enhanced the consistency and comparability of the collected information. Throughout the process, the review team held regular meetings to address any challenges encountered during data extraction and to maintain a unified approach in their methodology.

The data extracted from the included studies encompassed several categories. Bibliographic information was collected, including the authors' names, year of

publication, journal or conference where the study was presented, and location where the research was conducted. Study characteristics were also documented, focusing on the design of the study, the size of the sample used, and the specific settings within the healthcare organizations where the research was conducted. The measurement method category captured information about novel approaches for assessing hospital performance and the quality of care provided. In addition, the utilization of measurement data was examined, specifically exploring how the information gathered through these new methods can be applied to strategic planning processes. Finally, the outcomes of implementing these new measurement techniques and their subsequent use in strategic planning were recorded, with particular attention paid to their impact and effectiveness in improving healthcare delivery and organizational performance.

## RESULT

### Eligible studies

The PRISMA flowchart provided a detailed and structured overview of the systematic literature review (SLR) process.

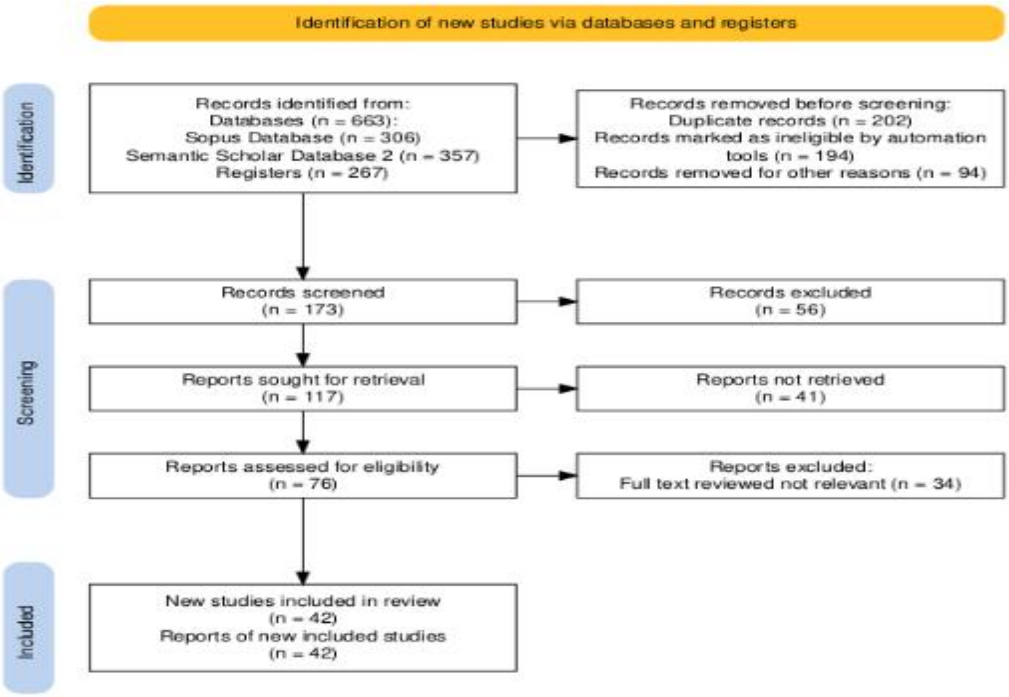



**Figure 1. Study inclusion of flow diagram**
Source : Data Analysis, 2024

It begins with the identification phase, where 663 references from 2019 to 2024 were identified from the Scopus database, 306 references, and the Semantic Scholar

database, 357 references. References removed before screening: duplicate records (n= 202), references marked as ineligible (n=194), not registered, and records removed for language not in English or Indonesian (n= 94). The initial pool of records was refined during the screening phase, leaving 173 records to be screened. During this screening process, 56 records were excluded based on the predefined criteria that the document type was not “Article” and “Conference” Paper, resulting in 117 reports proceeding to the retrieval phase.

During this retrieval process, 41 records were excluded based on the predefined criteria that the document type was not Article and"Conference Paper, resulting in 76 reports proceeding to the eligibility phase. During the eligibility phase, 76 full-text articles were meticulously assessed to determine their suitability for inclusion in the study. Of these, 42 reports were deemed eligible for qualitative synthesis, while 34 were excluded for specific reasons and were categorized into three distinct groups. Finally, 42 studies were included in the qualitative analysis.

**Study Characteristics**

A systematic literature review of "new methods for measuring hospital performance and quality of care" revealed a comprehensive landscape of methodologies and findings across various studies. The reviewed studies encompassed a range of bibliographic entries, with authors from diverse academic and clinical backgrounds contributing to the discourse on healthcare performance metrics. These studies have been published in reputable journals and conference proceedings, primarily focusing on healthcare settings in the United States, although some research has been conducted in international contexts, thus providing a broader perspective.

Methodologically, these studies employed a variety of approaches including quantitative analyses, qualitative interviews, and mixed-method designs, reflecting a robust effort to assess hospital performance from multiple perspectives. The population samples varied significantly, ranging from patients in urban hospitals to those receiving care in rural clinics, and often included specific demographic groups such as elderly patients or individuals with chronic conditions. This diversity in the population samples enhances the generalizability of the findings, allowing for a more nuanced understanding of hospital performance in different settings.

The datasets utilized in these studies were equally diverse, comprising national healthcare databases, hospital administrative records, and patient survey responses such as the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) for measuring patient satisfaction. The variables assessed included independent variables, such as hospital characteristics and healthcare policies; dependent variables encompassing patient outcomes and quality of care metrics; and mediating factors, such as patient engagement and care coordination. Additionally, moderating variables including socioeconomic status and geographic location were considered to understand their impact on healthcare delivery outcomes.

In terms of study characteristics, the majority of included studies employed observational designs, such as cohort and cross-sectional methodologies, with sample sizes ranging from 50 to > 10,000 participants, demonstrating a wide spectrum of research rigor. The settings for these studies spanned various healthcare organizations, including public hospitals, private clinics, and specialized care facilities, thus providing a comprehensive overview of the healthcare landscape.

The analytical tools used in these studies included advanced statistical software such as SPSS, R, and SAS for quantitative data analysis, along with qualitative analysis software such as NVivo for thematic evaluation of interview data. The incorporation of meta-analysis techniques further strengthened the synthesis of results across multiple studies, allowing for a more comprehensive understanding of the effectiveness of new measurement methods in enhancing hospital performance and quality of care. Ultimately, this systematic review underscores the critical need for context-specific approaches to evaluatinge healthcare effectiveness, emphasizing the importance of innovative measurement methods for informing strategic planning within healthcare institutions.

*Results of syntheses*

*Research Question: "What are the new methods for measuring hospital-performance and hospital-quality of care, and how the data from them can be utilized for more effective strategic planning?"*

The measurement of hospital performance and quality of care has evolved along with the development of new methodologies to address the complexities of healthcare delivery. These methods not only provide a more comprehensive assessment of hospital

performance but also offer data that can be leveraged for strategic planning. This study explored several innovative approaches for measuring hospital performance and quality of care, highlighting how data from these methods can be utilized for effective strategic planning.

**Federated Causal Inference Framework**

A novel federated causal inference framework was developed to measure hospital quality, while preserving data privacy. This method uses a doubly robust estimator to assess the mean potential outcome in a target population, significantly improving the precision of treatment effect estimates. This approach is particularly useful in settings where data sharing is restricted due to privacy concerns, as it only requires the exchange of summary statistics between hospitals (Han et al., 2024).

The application of this framework to evaluate cardiac centers demonstrated improved precision in treatment-effect estimates, which can lead to more informed strategic decisions regarding treatment protocols and resource allocation (Han et al., 2024).

**Comprehensive Efficiency Index (CEI)**

The Comprehensive Efficiency Index (CEI) integrates various performance indicators, including productivity, quality of care, economic efficiency, and patient satisfaction, to provide a holistic view of hospital performance. This multidimensional approach allows hospitals to identify areas for improvement and optimize resource utilization (Maria Cati, 2024).

Using CEI, hospitals can strategically plan interventions to enhance patient outcomes and operational efficiency, aligning their goals with broader healthcare objectives(Maria Cati, 2024).

**Multidimensional Quality Assessment**

The Electre Tri-nC method combined with the Multiple Criteria Hierarchy Process (MCHP) offers a multidimensional approach to hospital quality assessment. This method categorizes hospitals into quality levels based on criteria, such as timeliness, effectiveness, safety, and efficiency (Ricardo et al., 2024).

This approach enables healthcare policymakers to effectively benchmark hospitals, identify best practices, and allocate resources more efficiently, thereby informing strategic planning and reform initiatives (Ricardo et al., 2024).

**Balanced Scorecard Method**

The Balanced Scorecard method provides a comprehensive performance measurement framework that includes financial, customer, internal process, learning, and growth perspectives. This method has been applied in various hospitals to assess performance beyond financial metrics (Hendrawan et al., 2024) (Nurhayati et al., 2023).

Using the Balanced Scorecard, hospitals can develop strategic plans that address both financial and non-financial performance aspects, ensuring a balanced approach to healthcare delivery (Hendrawan et al., 2024) (Nurhayati et al., 2023).

**Electronic Clinical Quality Measures (eCQMs)**

eCQMs are part of health information technology that measures hospital performance in terms of profitability, efficiency, and quality. Although its impact on quality is less pronounced, eCQMs provide valuable data for strategic planning by highlighting areas of improvement in hospital operation (Lee et al. 2023).

The implementation of eCQMs can guide hospitals in enhancing their information systems and aligning their strategic goals with performance metrics (Lee et al., 20233)

**Programmatic Quality Measures**

Programmatic quality measures align structures, processes, and outcomes in order to streamline quality measurements and improve care navigation. These measures address the limitations of existing metrics by focusing on the minimum resource requirements and enhancing teamwork and communication (Peters et al., 2024).

By adopting programmatic measures, hospitals can align their strategic objectives with quality improvement initiatives, thereby ensuring a patient-centric approach to healthcare delivery(Peters et al. 2024).

Although these methods offer innovative ways to measure and improve hospital performance, it is essential to consider the challenges associated with data integration and need for a supportive regulatory framework. The effective use of hospital data for strategic planning requires overcoming barriers, such as data generalization and privacy concerns, as well as enhancing the regulatory environment to facilitate data-driven decision-making.

**Discussion**

One of the most significant contributions is the Federated Causal Inference Framework highlighted by Han et al. (2024). This framework adequately balances the

need for rigorous quality assessment with the imperative of data privacy, utilizing a doubly robust estimator to enhance the accuracy of treatment effect estimates. The application of this framework in cardiac centers demonstrates its potential to inform strategic decisions regarding treatment protocols and resource allocation, thereby emphasizing its practical implications in sensitive healthcare environments.

Complementing this, the Comprehensive Efficiency Index (CEI) introduced by Cati (2024) presents a holistic approach for measuring performance. By integrating indicators related to productivity, quality of care, economic efficiency, and patient satisfaction, the CEI enables hospitals to identify areas for improvement and optimize resource utilization. This multidimensional perspective is crucial for aligning operational goals with broader healthcare objectives, and ultimately fostering enhanced patient outcomes and operational efficiency.

Further enriching this discourse, (Ricardo et al., 2024) employed the Electre Tri-nC method alongside the Multiple Criteria Hierarchy Process (MCHP) to offer a comprehensive quality assessment framework. This methodology categorizes hospitals based on key performance criteria such as timeliness, effectiveness, safety, and efficiency. By establishing benchmarks, this approach helps policymakers identify the best practices and allocate resources more effectively, thereby informing strategic planning and reform initiatives.

The Balanced Scorecard method, as discussed by Hendrawan et al. (2024) and (Nurhayati et al., 2023), provides an expansive performance measurement framework that transcends the traditional financial metrics. By incorporating perspectives from financial, customer, internal processes, and organizational growth, this method facilitates the development of strategic plans that comprehensively address both financial and nonfinancial performance aspects.

Studies have shown that using BSC in hospitals, such as RSUD Cimacan and Royal Prima Hospital Medan, helps identify strengths and weaknesses across different performance dimensions, which can guide strategic initiatives such as aggressive growth or improving customer satisfaction (Hendrawan et al., 2024) (Hasibuan et al., 2022). This balanced approach ensures that healthcare delivery aligns with overarching goals of quality enhancement and patient satisfaction.

Moreover, the integration of Electronic Clinical Quality Measures (eCQMs) as outlined by Lee et al. (2023) represents a vital intersection between technology and performance measurements. While eCQMs primarily focus on profitability and efficiency, they also highlight areas for operational improvement, guiding hospitals to refine their strategic objectives and enhancing their information systems.

Finally, programmatic quality measures introduced by Peters et al. (2024) emphasize the alignment of structures, processes, and outcomes, fostering a patient-centric approach to healthcare delivery. By addressing the existing metric limitations and enhancing teamwork and communication, these measures ensure that hospitals can effectively align their strategic objectives with quality improvement initiatives.

Despite the promise of these methodologies, the synthesis reveals critical challenges, particularly those related to data integration and the necessity for a supportive regulatory framework. As Skaletskyi et al. (2024) noted, overcoming barriers such as data generalization and privacy concerns is essential for leveraging hospital data in strategic planning. Thus, the comprehensive analysis underscores the importance of innovative measurement methods as well as the need for systemic changes that facilitate their adoption, ultimately aiming to improve hospital performance and quality of care across the healthcare landscape.

Strategic planning in hospitals relies heavily on data utilization to enhance quality and performance. Key strategic determinants, including competitive intelligence, strategic leadership, and organizational culture, play a crucial role in shaping hospital quality (Caccia-Bava et al., 2022). By measuring and understanding these factors, hospitals can effectively guide their strategic planning efforts to improve overall performance. Financial performance is closely tied to quality measures, with research indicating a significant association between the two. This relationship suggests that investments in quality improvement initiatives are not only financially sustainable but also beneficial for strategic planning, as they can lead to enhanced hospital profitability (Beauvais et al., 2023). Furthermore, performance measurement data serves as a valuable tool for benchmarking against national and international standards. This benchmarking process enables hospitals to identify performance gaps and develop targeted strategies to meet quality indicators, ultimately improving healthcare delivery (Ilyas, 2022). By leveraging these data-driven insights, hospitals can make informed

decisions and implement effective strategies to enhance their quality, financial performance, and overall healthcare delivery.

## CONCLUSION

In conclusion, the systematic literature review revealed diverse approaches to measuring hospital performance and quality of care, and the importance of tailoring the choice of method to the specific context and goals of the healthcare organization. The implementation of new methods for measuring hospital performance and quality of care has the potential to lead to more effective strategic planning and improved patient outcomes, bridging the existing knowledge gap and revolutionizing hospital performance evaluation.

The future scope of this research includes exploring the potential of integrating technology, patient-centered metrics, and systematic frameworks for measuring hospital performance and quality of care. Additionally, further studies could investigate the impact of these new methods on healthcare resource allocation and patient outcomes as well as the challenges and limitations of implementing these methods in diverse healthcare settings.

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