

# Hospital Performance and Operational Management: A Bibliometric Review of Key Factors Affecting Effectiveness

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## ABSTRACT

This study employs bibliometric and co-authorship network analyses to investigate the landscape of research in hospital performance and operational management. Using VOSviewer, key themes were visualized to depict the concentration and evolution of research areas from technology integration to quality management within healthcare settings. The study identifies central researchers and maps collaborative networks, revealing both densely interconnected groups and isolated researchers. Practical implications are discussed for academic researchers, hospital administrators, and policymakers, highlighting areas for strategic development and potential collaboration. Limitations such as selection bias and the exclusion of qualitative impact underscore the need for cautious interpretation of the results. The study provides a foundational tool for stakeholders to understand the current research environment and to guide future healthcare management practices effectively.

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## 1. INTRODUCTION

Hospital performance and operational management are critical areas that impact staff satisfaction, patient outcomes, and overall institutional efficacy in the rapidly changing healthcare sector [1]. Performance indicators must be continuously reviewed and improved due to the intricacy of hospital operations and the importance of healthcare services [2]. Hospital performance has historically been assessed using a variety of criteria, including patient care quality, operational effectiveness, and financial sustainability [1]. These complex assessments draw attention to the delicate balance that

hospital managers need to keep in place to guarantee the best possible results [3].

Furthermore, hospital performance indicators now include additional dimensions as a result of the incorporation of cutting-edge technologies and procedures into healthcare systems [4]. Technological advancements such as electronic health records, telemedicine, and healthcare analytics have revolutionized conventional operating procedures, posing both obstacles and prospects for enhancing efficiency. Because of this, research in hospital management has come to emphasize more and more how these technology developments may be applied to

improve operational effectiveness and service delivery.

Hospital operational strategies are further complicated by the many legislative, cultural, and economic conditions that impact the global healthcare scene [5]. Variations in healthcare regulations, patient demographics, and funding sources throughout geographic areas call for a customized hospital management strategy [1]. This variability necessitates a thorough comprehension of the ways in which contextual factors impact hospital performance as well as the tactics that work well in different contexts [2].

Hospital operations are strongly impacted not only by internal management practices but also by external forces including aging populations, changing disease patterns, and healthcare reforms. Hospitals must frequently make strategic changes in order to maintain or raise their performance standards. The combined impact of these external and internal factors emphasizes the necessity of a thorough bibliometric analysis to map out current research trends and pinpoint knowledge gaps regarding hospital performance and operational management.

A fragmented knowledge of how integrated operational management methods directly impact hospital effectiveness and efficiency persists despite a wealth of research on hospital performance. Few reviews have tackled the subject from a bibliometric perspective that covers an operational management holistically, despite the fact that several have synthesized data on certain elements, such as cost management or patient satisfaction. This disparity makes it more difficult for hospital administrators to put into practice all-encompassing plans that successfully address every aspect of performance. Furthermore, it is unclear how new trends and technological advancements are influencing hospital management best practices, which is crucial for adjusting to the quickly evolving healthcare landscape.

This study aims to do a bibliometric analysis of the body of literature on operational management and hospital performance. The purpose of this review is to

ascertain and evaluate the critical elements that have been empirically demonstrated to impact hospital efficacy and efficiency. This study aims to provide a structured perspective into the history of hospital management practices over time and synthesize a thorough understanding of effective operational strategies by outlining the important topics and trends in current research. In addition to highlighting the most efficient procedures, this analysis will assist identify the areas in which more research is required to improve hospitals' operational effectiveness worldwide.

## 2. LITERATURE REVIEW

### 2.1 *Service Quality and Patient Satisfaction*

Service quality in hospitals is directly linked to patient satisfaction, which is often used as a primary indicator of hospital performance.

Studies consistently show that higher levels of patient satisfaction are correlated with better clinical outcomes and increased patient loyalty [6]. Factors such as communication skills of healthcare providers, empathy, and responsiveness play critical roles in enhancing patient perceptions of service quality. For example, [7] demonstrated that the emotional support provided by hospital staff significantly influences patient satisfaction scores. Furthermore, the physical environment of the hospital, including cleanliness and privacy, also affects patient attitudes towards the healthcare received.

### 2.2 *Operational Efficiency*

Operational efficiency in hospitals refers to the ability to deliver quality healthcare services in a cost-effective and timely manner. This aspect of

hospital performance is often measured by metrics such as length of hospital stay, readmission rates, and utilization of hospital resources [8]. Efficient use of resources not only reduces operational costs but also improves patient outcomes by minimizing delays and waiting times. Process improvement methodologies like Lean and Six Sigma have been widely adopted in hospital settings to streamline operations and eliminate waste. Studies by [9] have shown that these methodologies significantly enhance operational efficiency without compromising the quality of care.

### **2.3 Patient Safety**

Patient safety is a critical component of hospital performance, with adverse events such as medication errors, surgical complications, and hospital-acquired infections directly impacting patient outcomes and hospital reputations. The literature highlights the importance of robust safety cultures and systems for reporting and analyzing errors as fundamental to improving safety outcomes [10]. Effective communication among healthcare providers and between providers and patients is also crucial for preventing errors. Implementations of comprehensive safety protocols and continuous training programs are shown to reduce the incidence of adverse events significantly.

### **2.4 Financial Management**

Financial health is paramount to the operational sustainability of hospitals. Revenue management, cost

control, and strategic financial planning are essential components of effective financial management in healthcare settings. The transition from fee-for-service to value-based payment models has prompted hospitals to focus more on cost-efficiency and quality outcomes [11]. Financial performance is often intertwined with operational efficiency, as reducing wastage and improving service delivery can also lead to better financial outcomes. Additionally, [12] argue that strategic investments in technology and infrastructure, while initially costly, can lead to long-term savings and improved service capabilities.

### **2.5 Technological Advancements**

The impact of technology on hospital performance cannot be overstated. Electronic health records (EHRs), telemedicine, and medical informatics are reshaping the way healthcare is delivered. These technologies improve access to patient information, enhance the accuracy of diagnostics and treatments, and facilitate better communication among healthcare teams [13]. The adoption of EHRs, for instance, has been linked with improvements in clinical decision-making and operational efficiency through better documentation and reduced duplication of tests.

### **2.6 Integration and Coordination of Care**

The integration of services and coordination among healthcare providers are vital for delivering high-quality, comprehensive care. Integrated care models, which often involve

multidisciplinary teams and coordinated treatment plans, are associated with better patient outcomes, particularly for chronic conditions. Studies by [14] emphasize that integrated care models not only improve clinical outcomes but also enhance patient satisfaction by providing more cohesive care experiences.

### 3. METHODS

The methodology of this study involves a bibliometric analysis to systematically review and quantify the extensive literature on hospital performance and operational management. Articles and papers will be collected from Google Scholar using the Publish or Perish software, which is

designed to retrieve and analyze academic citations. This collection will focus on literature published in 1969-2024 using keywords such as "hospital performance," "operational efficiency," "patient satisfaction," and "healthcare management" to ensure relevancy. The retrieved documents will undergo a content analysis using VOSviewer software, which is adept at creating and visualizing bibliometric networks. This approach will help identify prevalent themes, trends, and research gaps by analyzing quantitative data such as the number of publications, citations, and co-authorships to assess the impact and collaboration patterns within the field. A thorough manual screening will also be conducted to filter out non-relevant or redundant studies, ensuring that the bibliometric review is both comprehensive and focused.

## 4. RESULTS AND DISCUSSION

### 4.1 Research Data Metrics

Table 1. Data Citation Metrics

Publication years	1969-2024
55	46 (1969-2024)
Paper	980
Citations	228857
Cites/year	4161.04
Cites/paper	233.53
Cites/author	115801.81
Papers/author	429.89
Author/paper	2.87
h-index	189
g-index	466
hI,norm	141
hI,annual	2.56
hA-index	64
Papers with ACC	: 1,2,5,10,20:886,815,631,402,220

Source: Publish or Perish Output, 2024

Table 1 presents a comprehensive set of bibliometric indicators derived from a dataset spanning publications from 1969 to 2024, analyzing a total of 980 papers. These publications have collectively garnered 228,857 citations, averaging 4,161.04 citations

per year, demonstrating a significant impact and enduring relevance in the field of hospital performance and operational management. The average citations per paper stand at 233.53, indicating high scholarly value and influence per publication. Notably, the ratio of

citations per author is exceptionally high at 115,801.81, suggesting that a relatively small group of authors has contributed substantially influential work. The papers to authors ratio (429.89) and the average number of authors per paper (2.87) further imply collaborative research efforts but with a considerable contribution per author. The h-index of 189 and g-index of 466 highlight a robust and impactful core of research outputs that have been widely recognized and cited. The normalized and annualized h-indexes

( $hI_{norm}$  of 141 and  $hI_{annual}$  of 2.56) adjust for factors like career length and provide a more nuanced understanding of author impact over time. The hA-index at 64 reflects the adjusted author productivity based on multi-authored papers. Moreover, the distribution of papers with accumulated citations (ACC) at various levels (1, 2, 5, 10, 20) with a majority (886 out of 980) receiving more than one citation, underscores the substantial visibility and impact these publications have had within the scholarly community.

Table 2. Top Cited Research

Citations	Authors and year	Title	Findings
13195	[15]	The competent manager: A model for effective performance	This study offers a competency-based framework that identifies essential managerial behaviors and skills necessary for effective performance. The model has significant implications for hiring, training, and performance assessment processes in healthcare management, guiding the development of leadership training programs tailored to enhance managerial effectiveness in hospital settings.
5562	[16]	Operations management	This textbook introduces a comprehensive array of concepts and practical tools for improving operational processes. It discusses the importance of capacity planning, lean operations, and quality management, specifically adapted for healthcare environments to streamline operations and improve patient care delivery.
5428	[17]	The effective executive	Drucker emphasizes the importance of time management, decision-making, and prioritization for executives. In the context of hospitals, these principles aid senior management in focusing on strategic initiatives that enhance organizational performance, such as improving patient throughput and resource allocation.
4523	[18]	Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review	The systematic review underscores the effectiveness of simulation-based medical education in enhancing clinical skills, critical thinking, and decision-making among healthcare professionals. The study advocates for the widespread adoption of high-fidelity simulations in medical training programs to reduce errors and improve patient outcomes.
4475	[19]	Factors influencing the effectiveness of relationship marketing: A meta-analysis	This meta-analysis provides evidence that strong relationships between healthcare providers and patients can significantly enhance patient loyalty and satisfaction. It suggests that hospitals should invest in relationship marketing strategies to improve patient engagement and trust, which are crucial for competitive advantage.
4398	[20]	Systematic review: impact of health information technology on	This review reveals that health IT systems, including electronic health records and patient management systems, contribute to significant improvements in healthcare quality and operational efficiency. The findings recommend the

Citations	Authors and year	Title	Findings
		quality, efficiency, and costs of medical care	adoption and optimization of IT systems to facilitate better data management, reduce costs, and streamline workflows.
4335	[21]	Lean manufacturing: context, practice bundles, and performance	The study illustrates how lean principles, when applied to hospital operations, lead to enhanced performance by minimizing waste and optimizing process flows. The principles of lean manufacturing are adaptable to the healthcare sector, providing a framework for hospitals to improve efficiency and patient care services.
4032	[16]	Operations management	This resource elaborates on various strategies to manage hospital operations effectively, from supply chain management to human resources. It discusses the critical role of operations management in ensuring that hospital resources are utilized efficiently, ultimately leading to better patient outcomes and reduced operational costs.
3124	[22]	The human factor: the critical importance of effective teamwork and communication in providing safe care	This article highlights the critical role of teamwork and effective communication in enhancing patient safety. It argues for structured communication protocols and teamwork training as essential components of safety management systems in healthcare settings.
2549	[23]	The design and use of performance management systems: An extended framework for analysis	Ferreira and Otley extend traditional performance management frameworks to better suit complex organizations like hospitals. They suggest that effective performance management in healthcare requires a holistic approach that considers various metrics, including clinical outcomes, patient satisfaction, and financial performance, to comprehensively evaluate and improve hospital services.

Source: Publish or Perish Output, 2024

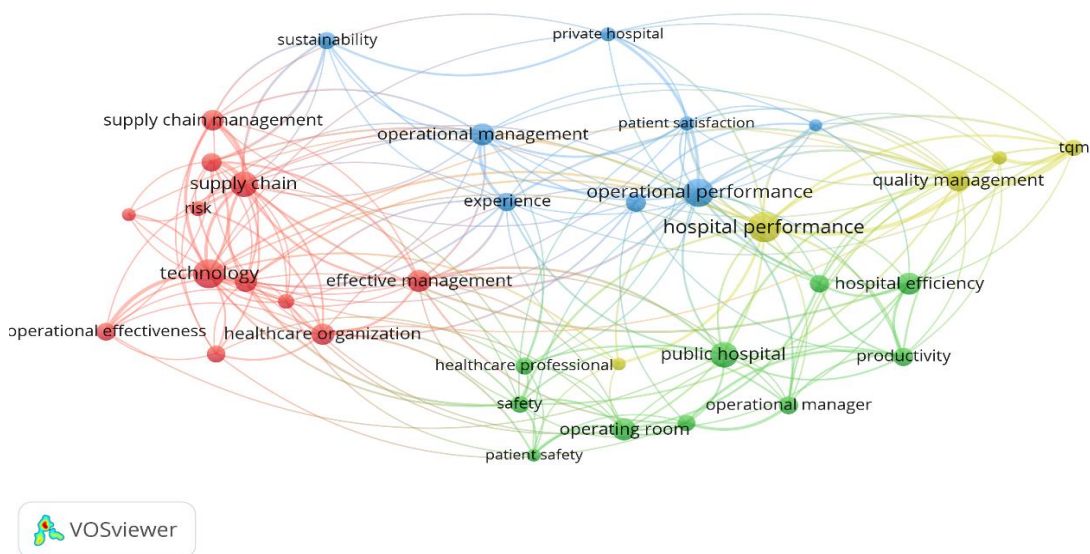


Figure 1. Network Visualization

Source: Data Analysis Result, 2024

The first VOSviewer visualization above represents a bibliometric network analysis of key themes related to hospital performance and operational management. The map is color-coded to distinguish different thematic clusters, each identified by a specific color and linked by lines indicating the relationships between various concepts within the hospital management literature.

In the red cluster, themes like "supply chain management," "technology," and "operational effectiveness" are prominent. This cluster emphasizes the critical role of efficient supply chain systems and the integration of advanced technologies in enhancing operational effectiveness within hospitals. The focus on "supply chain risk" underlines the importance of managing risks associated with supply chain operations to maintain the stability and reliability of hospital services.

The green cluster focuses on "hospital performance," "hospital efficiency," "quality management," and "productivity." These terms are interconnected strongly, suggesting a significant focus in the literature on improving hospital operations through enhanced efficiency and quality management practices. The presence of "public hospital" and "operational manager" within this cluster indicates a particular interest in the management practices and performance outcomes in public healthcare facilities.

The blue cluster contains terms like "patient satisfaction" and "experience," highlighting the human-centric aspects of hospital operations. This cluster suggests that improving patient experience and satisfaction is a critical outcome of effective hospital management. The links between "patient satisfaction" and terms in other clusters such as "quality management" and "hospital performance" underscore the integrated approach needed to optimize both the operational and patient-centric functions of hospitals.

The yellow cluster in the VOSviewer visualization predominantly revolves around themes such as "total quality management"

(TQM) and its application within hospital settings. This cluster suggests a strong focus on comprehensive quality approaches that integrate all aspects of hospital operations to improve performance and patient outcomes. The term "TQM" itself is a management approach aimed at long-term success through customer satisfaction, and in a hospital context, this translates to patient-centered care, indicating an emphasis on ensuring high-quality healthcare services. The connection of this cluster to other clusters, especially the green one, highlights the perceived importance of quality management not just as an operational priority but as a strategic imperative that influences overall hospital efficiency and productivity.

The green cluster, as previously noted, concentrates on terms like "hospital performance," "hospital efficiency," "productivity," and "quality management." This cluster represents the core operational focus within hospital management literature, where efficiency and productivity are seen as crucial for enhancing overall performance. The presence of terms like "public hospital" and "operational manager" indicates a specific emphasis on the management practices and challenges within publicly funded healthcare facilities, which often face unique pressures such as budget constraints and high patient loads. This cluster's connection to "operational performance" and "hospital efficiency" underscores the critical role of effective management practices in achieving optimal operational outcomes in the healthcare sector.

Overall, the network visualization provides a comprehensive overview of the interconnected nature of hospital performance and operational management research. It reflects the complexity of managing healthcare institutions, where improvements in technology, supply chain management, and operational efficiency directly influence quality management, patient safety, and satisfaction. This map serves as a valuable tool for identifying central and emerging themes in the literature,

guiding future research to fill gaps and further explore the connections between these critical areas.

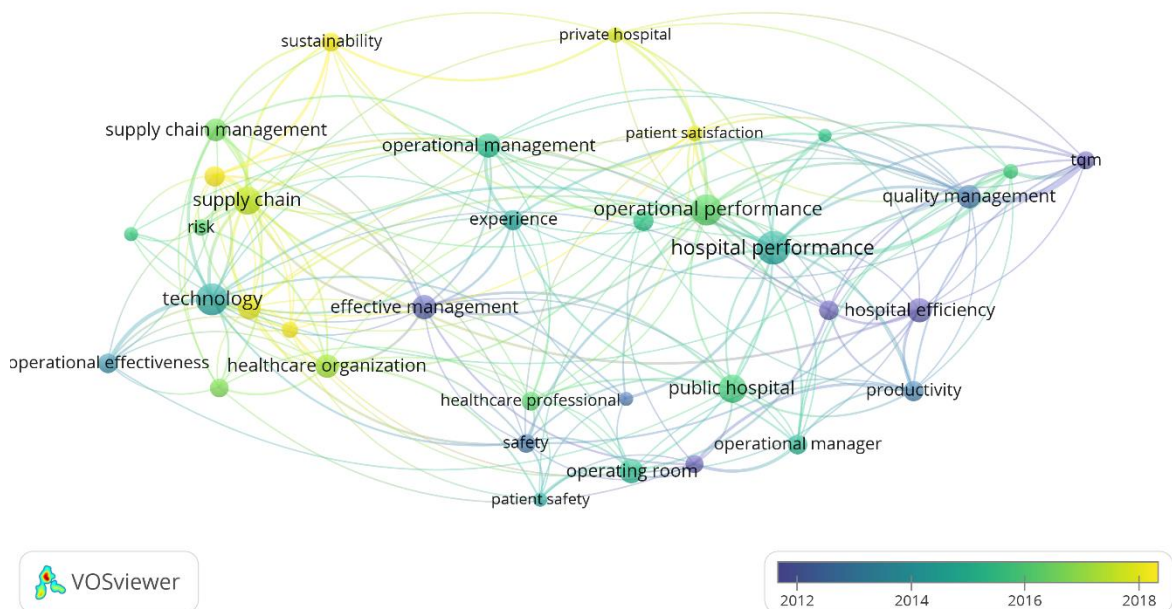


Figure 2. Overlay Visualization  
Source: Data Analysis Result, 2024

This second figure represents a temporal analysis of the research themes related to hospital performance and operational management from 2012 to 2018, highlighting the evolution and focus of academic interest over time. Each node, representing different thematic areas within the field, is color-coded based on the year, with the gradient from yellow to blue indicating the progression from earlier to more recent focus within the timeframe.

In the earlier years, marked by yellow nodes, themes such as "technology," "supply chain risk," and "operational effectiveness" were predominant. This suggests that during this period, there was significant scholarly attention on integrating new technological advancements and addressing risks in supply chain management as critical components of enhancing hospital operational effectiveness. The focus on technology likely reflects the ongoing digital transformation in healthcare, emphasizing the need for hospitals to adopt

innovative technologies to improve care delivery and operational efficiency.

As time progresses towards the blue nodes around 2018, there is a noticeable shift towards themes like "total quality management" (TQM), "hospital efficiency," and "public hospital." This shift indicates a growing focus on refining quality management practices and improving efficiency, particularly in public hospitals. The transition towards these themes could be driven by the increased pressures on public healthcare systems to deliver higher quality care amidst constraints like budget limitations and higher patient volumes. The connectivity between different nodes across the years also shows an integrated approach to hospital management research, where earlier advancements in technology and supply chain management are seen as foundational to later improvements in hospital efficiency and quality management practices.



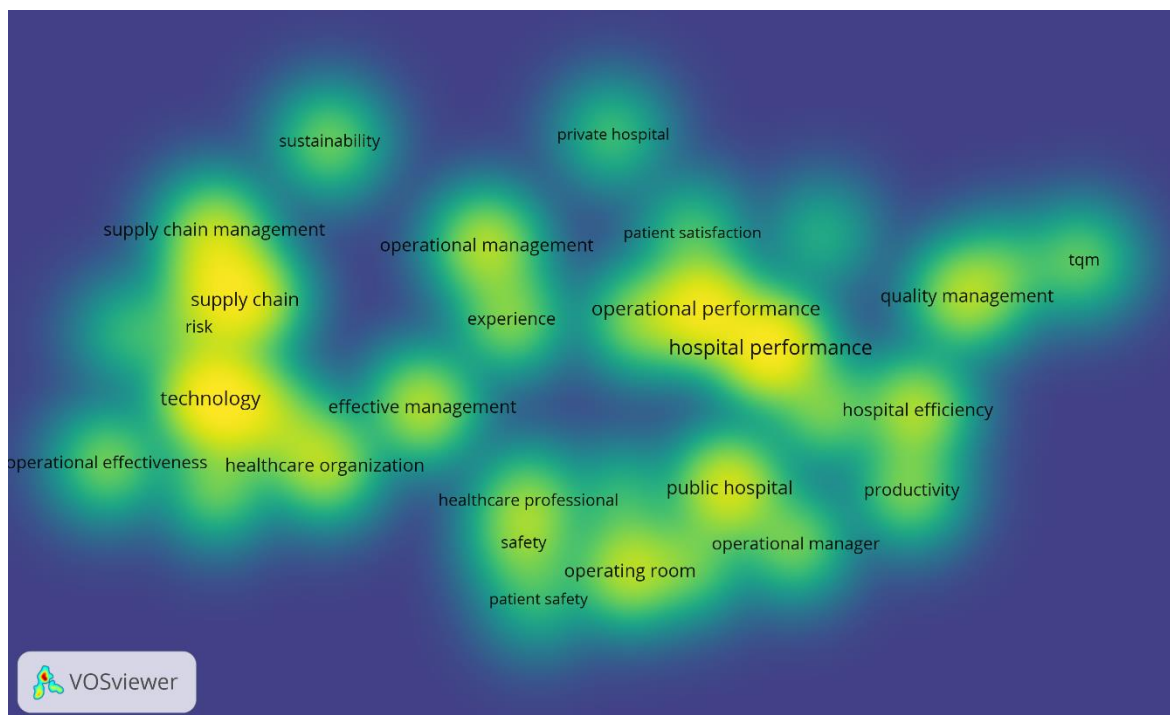


Figure 3. Density Visualization

Source: Data Analysis, 2024

This VOSviewer visualization employs a density view to depict the concentration of research themes within the domain of hospital performance and operational management. In this representation, the warmer colors (yellow and green) signify areas with higher densities of research activity, while cooler colors (blues) indicate less densely explored themes. This visualization technique helps identify the core areas of focus and the relative saturation of research within each topic.

In the visualization, central and densely colored areas like "hospital performance," "operational performance," and "quality management" highlight these as focal points of substantial academic interest, suggesting a robust body of literature that

addresses these themes comprehensively. Around these core areas, related sub-themes such as "patient safety," "hospital efficiency," and "technology" also show significant research activity, indicating their importance in contributing to the broader understanding of hospital operational dynamics. Conversely, areas such as "sustainability" and "private hospital" appear in cooler tones, suggesting these are less frequently explored in the literature, thereby potentially representing areas ripe for future research. This distribution assists in understanding the existing research landscape, guiding both academic and practical focus towards well-established versus emerging topics in hospital management.

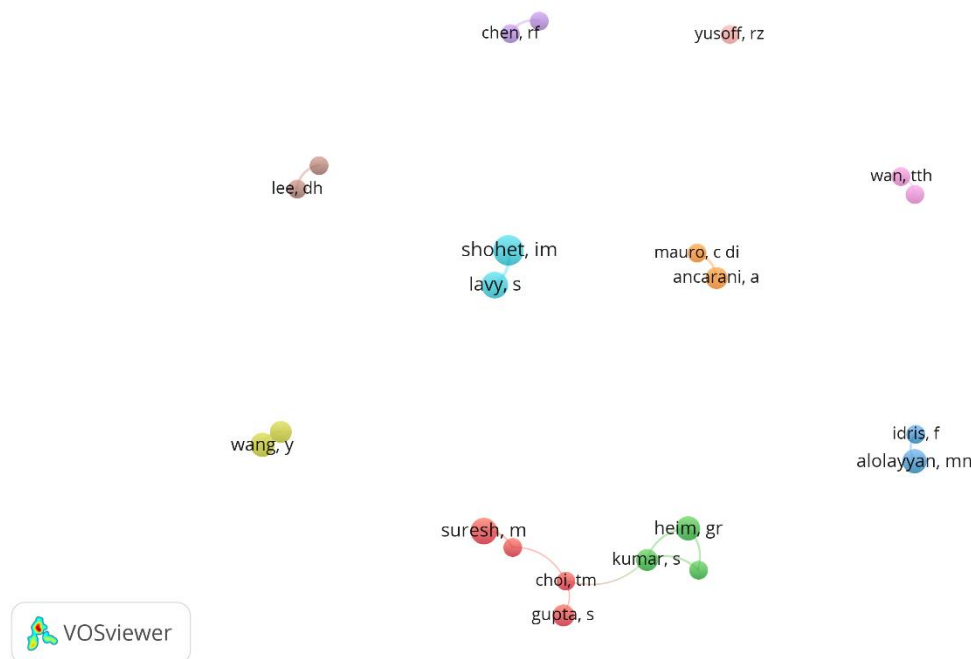


Figure 4. Author Collaboration Visualization

Source: Data Analysis, 2024

This visualization depicts a co-authorship network of researchers within a certain academic field, mapped using VOSviewer. Each node represents an individual researcher identified by their initials, and the size of each node is typically indicative of their publication output or centrality within the network, although specific details on the scaling factors like publication count or citation impact are not provided here. The links between nodes signify co-authorship relations, suggesting collaboration on research papers. The varying colors of the nodes likely designate different research clusters or groups, reflecting patterns of collaboration among researchers who frequently co-author together.

This network is somewhat dispersed, with several small clusters and isolated nodes, indicating a field where collaboration is present but not extensively interconnected across all researchers. The clusters might represent specialized groups focusing on different sub-topics or methodologies within the broader research area. Notable clusters include the central group with researchers "Suresh, M", "Kumar, S", and "Choi, TM",

suggesting a strong collaborative trio. In contrast, researchers like "Lee, DH" and "Chen, RF" appear more isolated, indicating fewer direct collaborations or possibly a focus on niche areas within the field. This type of visualization is crucial for identifying key players in a research area and understanding the collaborative dynamics, which can inform new researchers about potential collaborators and existing networks.

#### Practical Implication

The bibliometric and co-authorship analyses provided in the four figures above offer several practical implications for stakeholders in the healthcare management research community, including academic researchers, hospital administrators, and policy makers.

1. For Academic Researchers and Institutions

The density and co-authorship visualizations highlight key themes and researchers with significant contributions to hospital

performance and operational management. Academic researchers can use this information to identify emerging research areas, such as sustainability and technology integration, which are less saturated and may offer opportunities for novel contributions. Institutions can also use these data to form strategic partnerships and foster interdisciplinary collaborations that bridge existing gaps between technology implementation and quality management in healthcare settings. Additionally, identifying influential researchers and understanding their networks can help new researchers and doctoral candidates connect with established experts for mentorship and collaboration opportunities.

## 2. For Hospital Administrators

The insights into prevalent research themes such as "patient satisfaction," "operational efficiency," and "technology" are crucial for hospital administrators aiming to enhance service delivery. Administrators should consider integrating advanced technological solutions like health information systems and high-fidelity medical simulations that have been shown to improve operational effectiveness and patient care quality. The focus on supply chain management and risk highlights the need for hospitals to adopt robust supply chain strategies to mitigate risks related to supply disruptions, which is particularly relevant in

the wake of global challenges like the COVID-19 pandemic.

## 3. For Policy Makers

Policy makers can use the insights from these analyses to inform healthcare policies and funding priorities. The emphasis on quality management and efficiency in research underscores the need for policies that promote quality improvements across both public and private healthcare sectors. Supporting research in underexplored areas such as sustainability in hospital operations could lead to more innovative, cost-effective, and environmentally friendly healthcare solutions. Additionally, fostering environments that enhance collaboration among researchers, as seen in the co-authorship networks, could accelerate advancements in healthcare management and policy effectiveness, ultimately improving overall public health outcomes.

## 5. CONCLUSION

The bibliometric and co-authorship visualizations provide a valuable snapshot of the research dynamics in hospital performance and operational management, highlighting key themes and influential researchers within the field. These analyses serve as a strategic tool for various stakeholders, from academic researchers seeking collaboration opportunities to hospital administrators and policymakers aiming to align operational practices with the latest research insights. By identifying both densely researched areas and less explored topics, the findings encourage targeted research initiatives and informed decision-making in healthcare management. However, the full potential of these insights can only be

realized when combined with comprehensive qualitative evaluations and continuous updates to include the latest research and emerging trends in the field.

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