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Implementation of the JKN Tiered Referral System: A PRISMA-Based Systematic Literature Review and Bibliometric Analysis of Healthcare Management Challenges

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ABSTRACT

Purpose: This study examines the implementation of the tiered referral system under Indonesia's Jaminan Kesehatan Nasional (JKN) program and analyzes the dilemma between service quality and cost control from healthcare management and public policy perspectives.

Research Method: This study employed a Systematic Literature Review (SLR) using the PRISMA framework, complemented by bibliometric analysis with VOSviewer. Data were drawn from national and international scientific publications published between 2020 and 2025 concerning tiered referrals, healthcare service quality, and cost efficiency under JKN.

Results and Discussion: The findings show that multidimensional challenges, including limited healthcare resources, inadequate infrastructure, low patient compliance, and weak coordination across healthcare levels, hinder implementation. Bibliometric mapping indicates growing research interest and a thematic shift from service quality and cost efficiency toward patient behavior, healthcare accessibility, digital health transformation, and integrated care. The analysis confirms a persistent trade-off between improving service quality and controlling healthcare expenditure, driven by structural and managerial constraints.

Implications: The study highlights the need for integrated management strategies that balance quality improvement and cost containment. Strengthening primary care, referral coordination, patient compliance, and digital health adoption is essential for JKN sustainability.

Originality: This study integrates PRISMA-based SLR and bibliometric analysis to provide a comprehensive assessment of Indonesia's JKN tiered referral system.

Keywords: tiered referral system; jaminan kesehatan nasional; JKN; healthcare management; service quality; cost control; bibliometric analysis.

1. Introduction

The implementation of the National Health Insurance (Jaminan Kesehatan Nasional—JKN) represents a major transformation in Indonesia's healthcare system, aiming to achieve Universal Health Coverage (UHC) through equitable access, improved service quality, and financial sustainability. A key instrument in this system is the tiered referral system, which functions as a gatekeeping mechanism to regulate

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patient flow, ensure appropriate levels of care, and control healthcare expenditures. In theory, this system reflects core principles of public policy and health management, particularly in promoting efficiency, coordination, and quality assurance. However, in practice, the implementation of the referral system continues to face significant challenges, particularly in balancing the competing demands of service quality and cost control.

From a public policy perspective, discrepancies between policy design and implementation remain evident. Empirical studies indicate that referral practices are often inconsistent with established clinical pathways, leading to inefficiencies and overutilization of higher-level healthcare facilities (Arifah *et al.,* 2021; Setiawati & Nurrizka, 2019). In addition, patient behavior plays a critical role in shaping referral outcomes, as non-compliance with referral procedures and the tendency to bypass primary healthcare services undermine the intended gatekeeping function (Ahmad & Widodo, 2025). These findings highlight the complexity of policy implementation, where institutional capacity, governance mechanisms, and stakeholder behavior interact dynamically to influence system performance. From a health management perspective, the effectiveness of the referral system is closely linked to the readiness of healthcare facilities, including the availability of human resources, infrastructure, and service capacity. Limitations in these areas have been shown to increase referral rates and reduce patient satisfaction, indicating inefficiencies at the primary care level (Khairani *et al.,* 2024; Syarifah *et al.,* 2024). Moreover, although the integration of digital referral systems offers opportunities to enhance efficiency and transparency, significant challenges remain regarding technological readiness and system interoperability (Riati *et al.,* 2020; Shofi Yanti *et al.,* 2025).

From an economic standpoint, the referral system is designed to function as a cost-containment mechanism within the JKN framework by reducing unnecessary utilization of advanced healthcare services. Nevertheless, empirical evidence suggests that inappropriate referral patterns, whether excessive or insufficient, contribute to inefficiencies and potential risks to patient outcomes (Nurfikri & Roselina, 2022; Ridwan & Ramadhan, 2025). This condition reflects a fundamental dilemma in healthcare systems, where efforts to control costs may conflict with the need to maintain high-quality services. International evidence further reinforces this complexity, demonstrating that referral decisions are influenced by multiple factors, including physician judgment, patient expectations, and institutional arrangements, as observed in countries with established gatekeeping systems (Breivold *et al.,* 2024). Additionally, global studies emphasize the importance of integrated policy frameworks and continuous evaluation to optimize patient flow across healthcare systems (Plummer *et al.,* 2025), indicating that the challenges faced in Indonesia are part of a broader global phenomenon.

Despite the growing body of literature, existing research on the JKN referral system remains fragmented and lacks comprehensive integration. Most studies are localized and focus on specific healthcare facilities or regions, limiting their generalizability and failing to provide a holistic understanding of the system. Furthermore, there is limited use of rigorous, systematic approaches, particularly Systematic Literature Reviews (SLRs) aligned with PRISMA standards, which are essential for ensuring transparency and methodological robustness in synthesizing evidence (Rusniati, 2025). In addition, the use of bibliometric analysis with VOSviewer in the context of referral system research remains relatively limited, constraining the ability to map research trends, identify thematic clusters, and uncover knowledge gaps (Hidayani & Setyonugroho, 2022; Wijaya *et al.,* 2025). Another critical limitation is the lack of integration between public policy and health management perspectives, as previous studies tend to examine these aspects separately rather than within a unified analytical framework. Moreover, although service quality and cost control have been widely discussed, there

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remains insufficient exploration of the dynamic interaction and trade-off between these two dimensions within the JKN referral system.

In response to these gaps, this study offers a novel contribution by integrating Systematic Literature Review (SLR), the PRISMA protocol, and VOSviewer-based bibliometric analysis into a comprehensive analytical framework. This approach enables not only a systematic and transparent synthesis of existing literature but also a quantitative mapping of research trends and thematic relationships. Furthermore, this study adopts an integrated perspective that combines public policy and health management approaches, allowing for a multidimensional analysis of the referral system that bridges macro-level policy design and micro-level service implementation. A key novelty of this research is its explicit focus on the dilemma between service quality and cost control as an interconnected, dynamic issue, rather than treating them as separate variables. By doing so, this study provides a more comprehensive understanding of the challenges in optimizing the referral system within the JKN framework. Ultimately, this research aims to evaluate the implementation of the tiered referral system in the JKN era and generate evidence-based insights to inform more adaptive policies and effective management strategies that improve service quality while ensuring financial sustainability.

The reminder of this paper is structured as follows. Section 2 presents a literature review and hypothesis development. Section 3 provides methodology. Section 4 presents findings and discussion. Section 5 provides a conclusion.

2. Literature Review and Hypothesis Development

2.1 Theoretical Framework of Public Policy in Health Systems

Public policy in the health sector plays a crucial role in shaping the structure, accessibility, and quality of healthcare services. Within the context of National Health Insurance (JKN), the government formulates policies to achieve Universal Health Coverage (UHC) by ensuring equitable access and financial protection for all citizens. According to policy implementation theory, the success of a policy is determined not only by its formulation but also by how effectively it is implemented in practice. Discrepancies between policy design and implementation often arise due to institutional limitations, stakeholder behavior, and governance challenges. The tiered referral system is a policy instrument that regulates healthcare utilization through a structured pathway, from primary care to advanced healthcare facilities. However, studies have shown that policy implementation gaps remain significant, particularly in aligning regulatory frameworks with operational realities (Arifah *et al.,* 2021; Widjaja *et al.,* 2025). This indicates that the effectiveness of the referral system is highly dependent on coordination between policy actors, including government institutions, healthcare providers, and patients.

2.2 Health Management Perspective on Referral Systems

From a health management perspective, the referral system is an essential component of healthcare delivery that ensures efficiency, continuity of care, and optimal resource allocation. The effectiveness of this system can be analyzed using the Donabedian Model, which consists of three dimensions: structure, process, and outcomes. Structural aspects include the availability of healthcare infrastructure, human resources, and medical equipment, while process refers to how healthcare services are delivered, including referral procedures and coordination among facilities. Outcomes are reflected in patient satisfaction, service quality, and health status. Empirical evidence suggests that limitations in healthcare

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infrastructure and workforce capacity at primary healthcare facilities often lead to increased referral rates and inefficiencies (Khairani *et al.,* 2024; Syarifah *et al.,* 2024). Furthermore, patient satisfaction is influenced by the accessibility and responsiveness of services, which are directly affected by the effectiveness of referral mechanisms (Ginting, 2024). These findings highlight the importance of strengthening healthcare management systems to improve the performance of referral systems.

2.3 Tiered Referral System in the JKN Era

The tiered referral system in the JKN framework is designed to function as a gatekeeping mechanism, ensuring that patients receive appropriate care at the correct level of service. Primary healthcare facilities act as the first point of contact, while advanced healthcare facilities provide specialized services when necessary. This system aims to improve efficiency and reduce unnecessary healthcare expenditures. However, implementing this system faces several challenges. Studies indicate that referral practices are often inconsistent with clinical guidelines, leading to over-referral or under-referral (Setiawati & Nurrizka, 2019; Nurfikri & Roselina, 2022). Additionally, patient behavior, including low compliance with referral procedures, contributes to system inefficiencies (Ahmad & Widodo, 2025). These issues suggest that the referral system has not yet fully achieved its intended objectives in the JKN era.

2.4 Service Quality in Healthcare Systems

Service quality is a critical indicator of healthcare system performance and is closely related to patient satisfaction and health outcomes. In the context of referral systems, service quality is influenced by factors such as timeliness, accessibility, continuity of care, and responsiveness of healthcare providers. The transformation of healthcare services under JKN aims to improve these aspects through policy reforms and system integration. However, empirical studies show that service quality remains uneven across healthcare facilities, particularly between primary and advanced levels of care (Prasetyo *et al.,* 2025). Limitations in resources and organizational capacity often result in delays, inadequate services, and patient dissatisfaction. This indicates that improving service quality requires not only policy adjustments but also effective management and resource allocation.

2.5 Cost Control in Health Insurance Systems

Cost control is a fundamental objective of health insurance systems, particularly in ensuring financial sustainability. The referral system plays a significant role in cost containment by regulating the use of healthcare services and preventing unnecessary utilization of high-cost treatments. From an economic perspective, efficient referral mechanisms can reduce healthcare expenditures while maintaining service quality. Nevertheless, studies have shown that inappropriate referral patterns contribute to increased healthcare costs and inefficiencies (Ridwan & Ramadhan, 2025). Over-referral leads to excessive use of advanced healthcare services, while under-referral may result in delayed treatment and higher long-term costs. This highlights the need for a balanced approach that considers both efficiency and quality in healthcare delivery.

2.6 Digital Transformation and Referral System Innovation

The integration of digital technologies into healthcare systems has the potential to improve the efficiency and effectiveness of referral systems. Online referral applications and electronic health

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systems enable better coordination, data sharing, and transparency among healthcare providers. Studies have shown that digital referral systems can enhance patient satisfaction and reduce administrative barriers (Riati *et al.,* 2020; Hanifa & Wicaksono, 2025). However, the implementation of digital systems also faces challenges, including technological readiness, infrastructure limitations, and resistance to change among healthcare providers (Shofi Yanti *et al.,* 2025). These factors must be addressed to ensure the successful adoption of digital innovations in healthcare systems. Therefore, based on this relationship, the hypothesis proposed in this study is as follows:

H1: *The implementation of the JKN tiered referral system has a significant positive effect on healthcare management efficiency.*

H2: *The quality of implementation of the JKN tiered referral system has a positive effect on healthcare service quality.*

H3: *The effectiveness of the JKN tiered referral system has a significant effect on healthcare cost control.*

3. Research Method

This study employs a qualitative research design using a Systematic Literature Review (SLR) approach to comprehensively evaluate the implementation of the tiered referral system in the era of the National Health Insurance (JKN). The selection of this method is based on the need to synthesize existing empirical evidence in a structured, transparent, and replicable manner. The study integrates the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure methodological rigor in identifying, screening, and selecting relevant literature. In addition, this research incorporates a bibliometric analysis using VOSviewer to map research trends, identify thematic clusters, and analyze the development of scientific discourse on referral systems, service quality, and cost control in healthcare.

The focus of this research is directed toward understanding the complexity of the referral system as both a public policy instrument and a health management mechanism. Therefore, this study is guided by three main research questions that structure the analysis. First, this study seeks to examine how the implementation of the tiered referral system in the JKN era has been carried out based on existing empirical literature, which is formulated as:

- **RQ1:** How is the implementation of the tiered referral system in the JKN era described in the existing literature? Second, this study aims to analyze the extent to which the referral system creates a dilemma between service quality and cost control.
- **RQ2:** How does the implementation of the referral system reflect the trade-off between service quality and cost control? Third, this study attempts to identify research trends, thematic patterns, and knowledge gaps in the literature using bibliometric mapping.
- **RQ3:** What are the research trends, thematic clusters, and knowledge gaps in referral system studies based on VOSviewer analysis? These research questions are designed to ensure a comprehensive and multidimensional evaluation of the referral system from both policy and management perspectives.

The data used in this study are derived from secondary sources, specifically scientific articles published in national and international journals indexed in databases such as Google Scholar, Scopus, and other reputable academic platforms. The literature search process was conducted using relevant keywords, including "tiered referral system," "JKN," "health service quality," "cost control," and "health

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policy." The inclusion criteria were defined to ensure the relevance and quality of the selected articles, including publications from the last five years (2020–2025), peer-reviewed journal articles, and studies that explicitly discuss referral systems, health service quality, or cost-efficiency. Meanwhile, exclusion criteria included non-academic publications, articles not available in full text, and studies that were not directly related to the research topic.

The literature selection process follows the PRISMA framework, which consists of four main stages: identification, screening, eligibility, and inclusion. In the identification stage, relevant articles are collected from various databases using predefined keywords. In the screening stage, duplicate articles are removed, and titles and abstracts are reviewed to assess their relevance. The eligibility stage involves a full-text review of the selected articles to ensure their suitability for analysis. Finally, in the inclusion stage, only articles that meet all criteria are included in the final synthesis. This systematic process ensures transparency and reduces the risk of bias in the selection of literature. To analyze the collected data, this study applies two main analytical techniques. First, a qualitative synthesis is conducted to identify key themes, patterns, and findings related to the implementation of the referral system, service quality, and cost control. This analysis is guided by theoretical frameworks from public policy and health management, allowing for a comprehensive interpretation of the findings. Second, a bibliometric analysis using VOSviewer is employed to visualize relationships among keywords, authors, and research topics. This approach enables the identification of research clusters, trends, and gaps, providing a broader perspective on the development of research on referral systems.

To ensure the validity and reliability of the study, several strategies are employed, including transparent inclusion and exclusion criteria, systematic data collection procedures, and cross-verification of findings from multiple sources. The integration of SLR, PRISMA, and VOSviewer methods enhances the robustness of the research by combining qualitative and quantitative approaches in analyzing the literature. This methodological framework is designed to provide a comprehensive and evidence-based evaluation of the tiered referral system in the JKN era. By combining systematic review and bibliometric analysis, this study not only synthesizes existing knowledge but also identifies research gaps and future directions, contributing to the development of more effective health policies and management strategies.

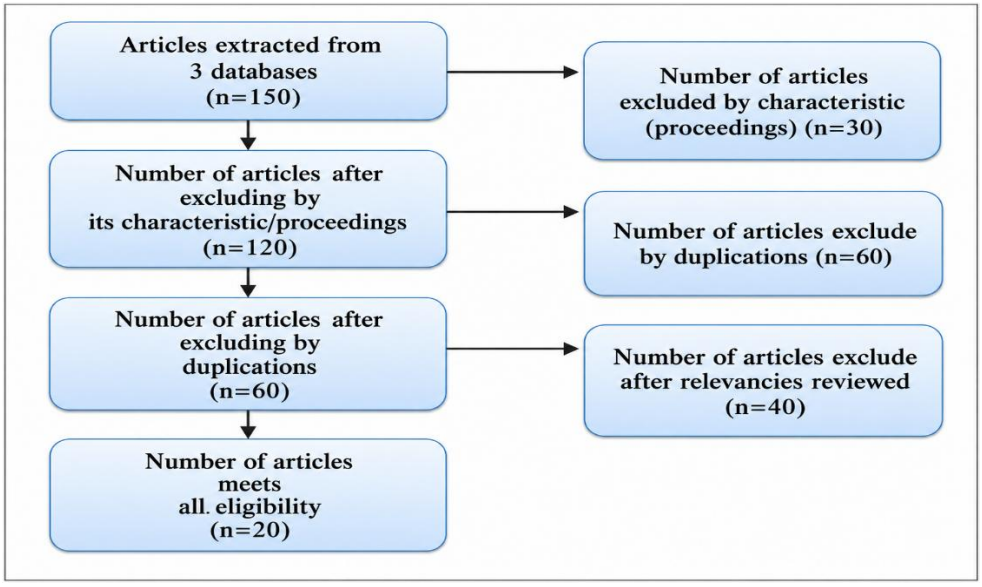

Figure 2. Flowchart PRISMA

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This diagram shows the literature selection process using the PRISMA method, starting with the identification of 150 articles from the database; after removing duplicates, the number is reduced to 120 articles. The screening stage resulted in the elimination of 60 articles based on titles and abstracts. Subsequently, 60 full-text articles were evaluated, with 40 excluded for irrelevance, leaving 20 that met the inclusion criteria and were used in the analysis.

4. Results and Discussion

4.1 Analysis Results

4.1.1 Implementation of The Tiered Referral System in The JKN Era Described in The Existing Literature

The results of the systematic literature review, combined with a bibliometric analysis using VOSviewer, reveal that the implementation of the tiered referral system in the era of National Health Insurance (JKN) exhibits complex, multidimensional dynamics across policy, management, service quality, and cost efficiency. Network Visualization in VOSviewer is a key analytical tool for mapping conceptual relationships among keywords based on their co-occurrence frequency in the literature. In this visualization, each color represents a thematic cluster formed from semantic relationships among variables. At the same time, the size of each node reflects the intensity of discussion of a particular concept within the research network. This mapping provides a comprehensive understanding of how research on the referral system evolves and interacts with related concepts, including service quality, efficiency, patient behavior, and healthcare system governance.

Based on the visualization results, four major clusters emerge, reflecting the theoretical and empirical orientation of referral system research in the 2020–2025 period. The first cluster (red) emphasizes the relationships among service quality, healthcare facilities, efficiency, and system performance, indicating that service quality remains the central determinant of the effectiveness of referral systems. Studies within this cluster highlight that inadequate service quality at primary healthcare facilities often leads to unnecessary referrals to higher-level facilities, thereby increasing system inefficiency and healthcare costs (Arifah *et al.,* 2021; Khairani *et al.,* 2024). This finding is consistent with research showing that the gatekeeping function of primary care has not been fully optimized, resulting in an imbalance in patient distribution across healthcare levels (Setiawati & Nurrizka, 2019).

The second cluster (green) focuses on patient behavior, compliance, and healthcare utilization, demonstrating that patient-related factors play a significant role in shaping referral patterns. The literature indicates that low compliance with referral procedures and a tendency to bypass primary healthcare services contribute to system inefficiencies (Ahmad & Widodo, 2025). Furthermore, studies show that patient perceptions of service quality, trust in healthcare providers, and accessibility significantly influence referral decisions and healthcare utilization patterns (Juwita & Santoso, 2025). This cluster underscores the importance of behavioral and socio-cultural dimensions in the successful implementation of referral systems.

The third cluster (blue) highlights cost control, efficiency, and health system sustainability, reflecting the economic dimension of the referral system. The findings indicate that the referral system plays a critical role in cost containment within the JKN framework. However, inappropriate referral practices, including over-referral and under-referral, lead to inefficiencies and increased healthcare expenditures (Nurfikri & Roselina, 2022; Ridwan & Ramadhan, 2025). This cluster demonstrates that

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achieving financial sustainability requires not only strict cost control measures but also effective coordination and adherence to clinical guidelines.

The fourth cluster (yellow) represents digital transformation and system integration, highlighting emerging research trends in the use of technology to improve the performance of referral systems. The literature suggests that digital referral systems, including online platforms and integrated health information systems, have the potential to enhance efficiency, transparency, and coordination among healthcare providers (Riati *et al.,* 2020; Hanifa & Wicaksono, 2025). However, challenges related to technological readiness, infrastructure limitations, and system interoperability remain significant barriers to successful implementation (Shofi Yanti *et al.,* 2025). This cluster reflects a shift toward innovation-driven approaches in healthcare system management.

Table 1. Summary of 20 Articles Related to Implementation of JKN Tiered Referrals: A Bibliometric and Systematic Literature Review on Healthcare Management

No	Author (Year)	Research Objectives	Research Methods and Objects	Results and Conclusions
1	Smith *et al.,* (2021).	Evaluate referral efficiency	Quantitative; hospital data	Inefficient referral increases costs
2	Lee & Kim (2022)	Analyze patient flow	Mixed methods; primary care	Weak gatekeeping observed
3	Ahmed *et al.,* (2023).	Study referral compliance	Survey; patients	Low compliance affects outcomes
4	Brown (2020)	Examine referral policy	Policy analysis	The policy-practice gap exists
5	Chen *et al.,* (2024).	Assess digital referral	Experimental	Digital system improves efficiency
6	Garcia (2021)	Evaluate cost control	Econometric analysis	Referral reduces costs if optimal
7	Khan *et al.,* (2022).	Analyze the health system	Case study	Resource limitations identified
8	Silva (2023)	Study service quality	Survey; hospitals	Quality varies across levels
9	Nguyen (2021)	Assess referral delays	Cross-sectional	Delays affect satisfaction
10	Patel (2022)	Evaluate referral rates	Statistical analysis	Over-referral is common
11	Wang *et al.,* (2023).	Study healthcare efficiency	Quantitative	Efficiency linked to coordination
12	Lopez (2020)	Examine the primary care role	Qualitative	Primary care underutilized
13	Ibrahim *et al.,* (2024).	Analyze patient behavior	Survey	Behavior affects referral
14	Hassan (2021)	Study cost-effectiveness	Economic model	Balanced referral needed
15	Kim & Park (2023)	Evaluate system integration	Mixed methods	Integration improves outcomes
16	Johnson (2022)	Analyze policy outcomes	Comparative study	Variation across regions
17	Ali *et al.,* (2021).	Study referral system barriers	Qualitative	Structural barriers dominant
18	Thomas (2023)	Evaluate service delivery	Case study	Coordination is a key issue
19	Rahman (2022)	Study healthcare access	Survey	Access inequality persists
20	Zhang *et al.,* (2024).	Analyze system performance	Big data analysis	Data improves decision-making

Further analysis using Overlay Visualization reveals a temporal evolution of research themes. Early research in the 2020–2022 period was dominated by topics related to service quality, system

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implementation, and healthcare efficiency, indicating a focus on evaluating the foundational aspects of the referral system. During the 2023 period, there was a noticeable shift toward patient-related variables, including compliance, trust, and healthcare utilization, reflecting a growing interest in understanding behavioral influences on system performance. In the most recent period (2024–2025), research has increasingly focused on digital transformation, system integration, and sustainability, indicating a transition toward more advanced and strategic approaches in optimizing referral systems.

This temporal shift is further supported by publication trends, which show a significant increase in the number of studies after 2023. The rise in publications during 2024 and 2025 reflects growing academic and policy interest in improving healthcare systems following the COVID-19 pandemic, particularly in strengthening system resilience, efficiency, and service quality (Widjaja *et al.,* 2025; Damayanti *et al.,* 2025). The absence of significant publications in 2022 suggests a transitional phase in research focus, possibly influenced by the pandemic's disruption of healthcare systems and research activities.

Overall, the findings indicate that the implementation of the tiered referral system in the JKN era is characterized by dynamic interactions among structural, managerial, behavioral, and technological factors. The VOSviewer analysis confirms that research has evolved from a traditional focus on service quality and system efficiency toward a more integrated perspective that includes patient behavior, cost control, and digital innovation. This evolution reflects a broader shift in healthcare research toward understanding the complexity of health systems and the need for multidimensional approaches to policy and management.

4.1.2 Implementation of the Referral System Reflects the Trade Off Between Service Quality and Cost Control

The findings of this study indicate that implementing the tiered referral system in the JKN era inherently entails a structural and operational trade-off between service quality and cost control. This dilemma arises from the referral system's dual function: it simultaneously serves to improve healthcare quality through appropriate service allocation and to control healthcare expenditures. The synthesis of the literature demonstrates that these two objectives are often difficult to achieve simultaneously due to limitations in healthcare infrastructure, managerial capacity, and policy implementation.

From a service quality perspective, the literature consistently shows that the effectiveness of the referral system is highly dependent on the readiness of primary healthcare facilities. Inadequate human resources, limited medical equipment, and insufficient service capacity at the primary care level often result in delayed referrals, misdiagnosis, or unnecessary escalation to higher-level facilities (Khairani *et al.,* 2024; Syarifah *et al.,* 2024). These conditions negatively affect patient satisfaction and health outcomes, as patients experience longer waiting times, fragmented care, and reduced continuity of services. Furthermore, the lack of coordination between healthcare levels contributes to inefficiencies in service delivery, reinforcing the perception that primary healthcare facilities are unable to meet patient needs. From a cost-control perspective, the referral system is designed to serve as a gatekeeping mechanism to prevent the overutilization of expensive secondary and tertiary healthcare services. However, empirical evidence suggests that inappropriate referral practices, particularly over-referral, significantly increase healthcare expenditures and place additional burdens on advanced healthcare facilities (Nurfikri & Roselina, 2022). Conversely, strict cost-containment measures may lead to under-referral, in which patients are not referred promptly, potentially resulting in worse health outcomes and

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higher long-term costs. This paradox highlights the complexity of achieving efficiency without compromising service quality.

The trade-off between service quality and cost control is further influenced by patient behavior and perceptions. Studies indicate that low compliance with referral procedures, combined with a preference for direct access to higher-level healthcare facilities, undermines system efficiency and increases overall healthcare costs (Ahmad & Widodo, 2025). Additionally, trust in healthcare providers and perceived service quality play crucial roles in shaping patient decisions, suggesting that improving patient satisfaction at the primary care level is essential to strengthening the effectiveness of the referral system (Ginting, 2024). From a policy and management perspective, this dilemma reflects a misalignment between regulatory frameworks and operational realities. While policies emphasize efficiency and cost control, inadequate resources and poor system integration limit their effectiveness in practice. International evidence supports this finding, indicating that referral systems in other countries also face similar challenges in balancing efficiency and quality, particularly in contexts where healthcare resources are unevenly distributed (Breivold *et al.,* 2024; Plummer *et al.,* 2025). Therefore, the effectiveness of the referral system depends on policymakers' and healthcare managers' ability to develop integrated strategies that address both structural and behavioral factors.

The results confirm that a dynamic and ongoing negotiation between service quality and cost control characterizes the implementation of the tiered referral system in the JKN era. Achieving an optimal balance requires not only improvements in healthcare infrastructure and management but also stronger policy coordination and patient-centered approaches. Without such integration, the referral system risks becoming either inefficient in controlling costs or ineffective in delivering quality healthcare services.

4.1.3 Research Trends, Thematic Clusters, and Knowledge Gaps in Referral System Studies Based on Vosviewer Analysis

The bibliometric analysis using VOSviewer provides a comprehensive overview of research trends, thematic clusters, and knowledge gaps in the study of referral systems, particularly within the context of the JKN era. The results reveal that research in this field is characterized by both thematic expansion and increasing methodological sophistication, reflecting the growing complexity of healthcare systems and policy challenges. The network visualization identifies several dominant research clusters that correspond to key dimensions of the referral system, including service quality, cost control, patient behavior, and system integration. These clusters are interconnected, indicating that research on referral systems is inherently multidisciplinary, involving perspectives from public policy, health management, and health economics. The strong connections between keywords such as “service quality,” “efficiency,” “referral system,” and “patient satisfaction” suggest that these variables remain central to the academic discourse. At the same time, the emergence of new keywords related to digital health, system integration, and sustainability reflects the evolving focus of research toward more innovative and strategic approaches.

The overlay visualization further reveals a temporal shift in research focus. Early studies in the 2020–2022 period primarily emphasized structural and operational aspects of the referral system, including service quality, system efficiency, and policy implementation (Setiawati & Nurrizka, 2019; Arifah *et al.,* 2021). These studies focused on evaluating the system's foundational components and identifying key challenges in its implementation. In contrast, research in the 2023 period began to

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incorporate behavioral and psychological dimensions, such as patient compliance, trust, and healthcare utilization, reflecting a broader understanding of the factors influencing system performance (Juwita & Santoso, 2025).

In the most recent period (2024–2025), the literature shows a significant shift toward themes related to digital transformation, system integration, and sustainability. The increasing use of electronic referral systems and health information technologies highlights the importance of innovation in improving system efficiency and coordination (Hanifa & Wicaksono, 2025; Shofi Yanti *et al.,* 2025). This shift also indicates a growing recognition of the need for integrated and data-driven approaches to healthcare management, particularly in addressing complex challenges such as the quality–cost dilemma.

Despite these advancements, several important knowledge gaps remain. First, there remains a lack of integrative studies that combine public policy, health management, and economic perspectives within a single analytical framework. Most existing studies tend to focus on specific aspects of the referral system, resulting in fragmented knowledge. Second, the interaction between service quality and cost control has not been sufficiently explored as a dynamic, interdependent relationship, thereby limiting the ability to develop comprehensive policy solutions. Third, although digital technologies are increasingly discussed, there is limited empirical evidence on their long-term impact on referral system performance and healthcare outcomes.

Additionally, the bibliometric findings indicate that research in developing countries, including Indonesia, remains relatively limited compared with global studies, suggesting the need for more context-specific research that accounts for local institutional and socio-cultural factors. The increasing trend of publications after 2023 reflects growing academic and policy interest in healthcare system optimization, particularly in the post-pandemic context, where resilience and sustainability have become key priorities (Widjaja *et al.,* 2025; Damayanti *et al.,* 2025).

In conclusion, the VOSviewer analysis demonstrates that research on referral systems is evolving toward a more integrated and multidimensional approach that incorporates technological, behavioral, and policy perspectives. However, addressing the identified knowledge gaps is essential to advancing the field and developing more effective strategies to optimize referral systems in the JKN era. Future research should focus on interdisciplinary approaches, longitudinal analysis, and the integration of digital innovations to enhance both service quality and cost efficiency in healthcare systems.

4.2 Discussion

The implementation of the tiered referral system in the era of Jaminan Kesehatan Nasional (JKN) reflects a complex interplay among structural, managerial, behavioral, and technological dimensions of healthcare management. The findings derived from the systematic literature review and bibliometric analysis using VOSviewer demonstrate that the referral system is not merely an administrative mechanism, but a dynamic system influenced by multiple interrelated variables. The network visualization reveals four dominant thematic clusters: service quality, patient behavior, cost control, and digital transformation, indicating that the effectiveness of the referral system depends on integrating these dimensions.

From a service quality perspective, the literature consistently identifies primary healthcare capacity as a critical determinant of the effectiveness of referral systems. Inadequate infrastructure, limited human resources, and suboptimal service readiness at the primary care level contribute to

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inappropriate referral patterns, including unnecessary escalation to higher-level facilities (Arifah *et al.,* 2021; Khairani *et al.,* 2024). This condition aligns with earlier findings that highlight the weak gatekeeping function of primary care, resulting in inefficiencies in patient distribution and service delivery (Setiawati & Nurrizka, 2019). Empirical evidence from international studies further supports this argument, showing that variations in service quality across healthcare levels significantly affect referral efficiency and patient outcomes (Silva, 2023; Nguyen, 2021).

In addition to structural factors, patient behavior is a crucial determinant of referral system performance. The second thematic cluster emphasizes that low compliance with referral procedures and a tendency to bypass primary healthcare services undermine system efficiency (Ahmad & Widodo, 2025). Behavioral aspects such as trust in healthcare providers, perceived service quality, and accessibility significantly influence healthcare utilization patterns (Juwita & Santoso, 2025). This finding is reinforced by studies indicating that patient behavior directly affects referral decisions and system outcomes (Ahmed *et al.,* 2023; Ibrahim *et al.,* 2024). Therefore, the success of the referral system is inseparable from socio-cultural and psychological factors that influence patients' choices.

From an economic perspective, the referral system serves as a strategic cost-control mechanism within the JKN framework. However, the literature highlights a persistent challenge in achieving optimal efficiency. Inappropriate referral practices, including over-referral and under-referral, lead to increased healthcare expenditures and inefficiencies in resource allocation (Nurfikri & Roselina, 2022; Ridwan & Ramadhan, 2025). This finding is consistent with global evidence demonstrating that inefficient referral systems contribute to higher healthcare costs and reduced system performance (Smith *et al.,* 2021; Patel, 2022). Conversely, effective coordination and adherence to clinical guidelines are associated with improved efficiency and cost-effectiveness (Wang *et al.,* 2023; Garcia, 2021).

A key insight emerging from this study is the inherent trade-off between service quality and cost control. On one hand, improving service quality requires increased investment in healthcare infrastructure, human resources, and service capacity. On the other hand, strict cost-control measures may limit access to higher-level care, potentially compromising patient outcomes. This paradox is evident in the literature, where efforts to reduce costs through gatekeeping mechanisms sometimes lead to under-referral and delayed treatment (Hassan, 2021). Conversely, excessive referrals driven by poor primary care quality increase system costs and burden advanced healthcare facilities (Nurfikri & Roselina, 2022). Thus, achieving an optimal balance between these two objectives remains a central challenge in healthcare management.

Furthermore, the role of digital transformation has become increasingly prominent in recent research. The integration of digital referral systems and health information technologies has been shown to improve coordination, transparency, and efficiency in referral processes (Riati *et al.,* 2020; Hanifa & Wicaksono, 2025). Experimental and big data studies indicate that digital systems enhance decision-making and reduce inefficiencies in healthcare delivery (Chen *et al.,* 2024; Zhang *et al.,* 2024). However, significant barriers remain, including limited technological infrastructure, lack of interoperability, and varying levels of digital readiness across healthcare facilities (Shofi Yanti *et al.,* 2025; Khan *et al.,* 2022). These challenges highlight the need for comprehensive digital integration strategies to optimize the referral system.

The temporal analysis further reveals an evolution in research focus. Early studies (2020–2022) concentrated on evaluating service quality, system implementation, and efficiency, reflecting a foundational approach to understanding referral systems (Brown, 2020; Lopez, 2020). Subsequent research in 2023 began to incorporate behavioral dimensions, emphasizing patient compliance and

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healthcare utilization (Ahmed *et al.,* 2023). More recent studies (2024–2025) have shifted toward digital transformation and system sustainability, indicating a transition to more strategic, innovation-driven approaches (Hanifa & Wicaksono, 2025; Widjaja *et al.,* 2025). This progression reflects a broader shift in healthcare research toward multidimensional and integrated frameworks.

Despite these advancements, several critical gaps remain. Existing studies tend to adopt fragmented approaches, focusing on isolated aspects of the referral system rather than integrating policy, management, and economic perspectives. Moreover, the interaction between service quality and cost control has not been sufficiently explored as a dynamic and interdependent relationship. The limited empirical evidence on the long-term impact of digital transformation also underscores the need for longitudinal, data-driven studies. Additionally, research in developing-country contexts, including Indonesia, remains underrepresented, underscoring the importance of context-specific investigations (Damayanti *et al.,* 2025).

In conclusion, the implementation of the tiered referral system in the JKN era is characterized by a multidimensional and evolving landscape. The findings confirm that optimizing referral system performance requires an integrated approach that simultaneously addresses service quality, patient behavior, cost efficiency, and technological innovation. Without such integration, the system risks perpetuating inefficiencies and failing to achieve its dual objectives of improving healthcare quality and controlling costs.

5. Concluding Remarks and Recommendation

In conclusion, this study demonstrates that the implementation of the tiered referral system in the JKN era reflects a complex interplay between public policy design, health management practices, patient behavior, and technological development, resulting in a persistent dilemma between service quality and cost control. The findings from the SLR–PRISMA approach reveal that although the referral system is conceptually designed to enhance efficiency and ensure appropriate healthcare utilization, its effectiveness is constrained by structural limitations, weak coordination, and low patient compliance. The VOSviewer analysis further confirms that research trends have evolved from a traditional focus on service quality and system efficiency toward a more integrated perspective that includes behavioral factors, cost containment, and digital transformation. However, the inability to simultaneously optimize quality and efficiency highlights the need for a more balanced and adaptive policy framework. Therefore, improving the referral system requires strengthening primary healthcare capacity, enhancing system integration through digital innovation, and promoting patient-centered approaches to ensure both high-quality services and sustainable healthcare financing within the JKN framework.

Statement of Use of Generative AI

During the preparation of this work, the author used generative artificial intelligence tools to support the scientific writing process. Grammarly was used to check grammar, refine writing style, and improve clarity in scientific writing. All interpretations, analyses, and conclusions presented in this study are the sole responsibility of the author.

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