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GLOBAL TRENDS IN PATIENT SAFETY AND SERVICE QUALITY: A BIBLIOMETRIC EXPLORATION FROM CLINICAL PRACTICE TO ORGANIZATIONAL CULTURE

Tren Global dalam Keselamatan Pasien dan Kualitas Layanan : Eksplorasi Bibliometrik dari Praktik Klinis Budaya Organisasi

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ABSTRACT
Patient safety and quality of service are crucial indicators in evaluating the effectiveness and accountability of healthcare systems. Despite the widespread implementation of clinical interventions and regulatory measures globally, significant challenges remain in ensuring safe and high-quality services, particularly in developing countries. This study aims to explore the trends and directions of research related to patient safety and quality of service during the 2015–2024 period using a bibliometric approach. Data were retrieved from the Scopus database using the keywords “Patient Safety” AND “Quality of Service” and were analyzed using VOSviewer software to visualize keyword networks, temporal trends, and term density. The analysis identified five major clusters in this area of study: (1) clinical interaction and human factors; (2) safety culture and organizational perception; (3) service quality and clinical procedures; (4) healthcare systems and hospital organization; and (5) the role of institutions and workforce. The findings indicate a shift in research focus from technical approaches toward systemic and humanistic perspectives. Communication among healthcare professionals, organizational culture, and technology adoption emerge as key elements in building an effective and sustainable patient safety ecosystem.

Keywords: *Patient Safety, Service Quality, Safety Culture, Bibliometric, VOSviewer*

ABSTRAK
Keselamatan pasien dan mutu layanan merupakan indikator krusial dalam mengevaluasi efektivitas dan akuntabilitas sistem pelayanan kesehatan. Meskipun intervensi klinis dan langkah-langkah regulasi telah diterapkan secara luas di seluruh dunia, tantangan signifikan masih ada dalam memastikan layanan yang aman dan berkualitas tinggi, terutama di negara-negara berkembang. Studi ini bertujuan untuk mengeksplorasi tren dan arah penelitian terkait keselamatan pasien dan mutu layanan selama periode 2015–2024 menggunakan pendekatan bibliometrik. Data diambil dari basis data Scopus menggunakan kata kunci "Keselamatan Pasien" DAN "Kualitas Layanan", dan dianalisis dengan perangkat lunak VOSviewer untuk memvisualisasikan jaringan kata kunci, tren temporal, dan kepadatan istilah. Analisis ini mengidentifikasi lima klaster utama dalam bidang studi ini: (1) interaksi klinis dan faktor manusia; (2) budaya keselamatan dan persepsi organisasi; (3) mutu layanan dan prosedur klinis; (4) sistem pelayanan kesehatan dan organisasi rumah sakit; dan (5) peran institusi dan tenaga kerja. Temuan ini menunjukkan pergeseran fokus penelitian dari pendekatan teknis menuju perspektif sistemik dan humanistik. Komunikasi antar tenaga kesehatan, budaya organisasi, dan adopsi teknologi muncul sebagai elemen kunci dalam membangun ekosistem keselamatan pasien yang efektif dan berkelanjutan.

Kata kunci: *Patient Safety, Service Quality, Safety Culture, Bibliometric, VOSviewer*

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INTRODUCTION

Patient safety is a critical component of the healthcare landscape. The primary goal is to reduce risks, errors, and harm while providing medical care. This is achieved through a multifaceted approach to ensure patients receive safe and effective care. The World Health Organization (WHO) has emphasised the importance of patient safety as a key feature of high-quality healthcare systems. This emphasis is reflected in various initiatives and strategic plans to minimise medical errors by establishing effective, sustainable systems (de Vries et al., 2009). The Global Patient Safety Action Plan (2021–2030), adopted by the 74th World Health Assembly, provides a strategic framework for improving patient safety worldwide. It has six strategic objectives and 35 actions to reduce harm during healthcare delivery (Astier-Peña et al., 2021).

Patient safety incidents (PSIs) have been identified as a major global problem, affecting millions yearly. These incidents can result in poor health, disability, and, in some cases, death, and are often caused by unreliable practices and substandard healthcare environments (Alshyyab et al., 2019). In developed countries, the average incidence of adverse events in hospitals is 9.2%, of which 7.4% are fatal and 43.5% are preventable. By contrast, in developing countries, the incidence of adverse events ranges from 2.5% to 18.4%, 30% of which are fatal and 83% preventable (Galadanci, 2013).

Patient safety and the quality of healthcare services are two fundamental aspects of the healthcare system that directly contribute to its effectiveness, efficiency, and the public's trust in healthcare facilities. Despite adopting standards and policies in various countries, medical errors and preventable events remain a global challenge (Gupta et al., 2019).

The Donabedian framework, developed in 1988, is a basic model for evaluating healthcare quality. It consists of three main components: structure, process, and outcomes. It has been widely adopted and adapted in various healthcare contexts to assess and improve patient safety and quality of care (De Rosis, 2024). Wundavalli et al. (2018) emphasise the importance of a systemic approach to reducing patient safety risks, advocating for a comprehensive examination of factors related to the healthcare system, organisational culture, and individual healthcare providers.

Another study, conducted by Li et al., (2022) and Mazumder (2024) revealed that health systems that effectively implement information technology (IT) can significantly reduce adverse medical events and improve the quality of service. These findings suggest that integrating IT into the healthcare environment enhances patient safety by reducing errors and improving the accuracy of information used for clinical decision making. Standardised and integrated IT systems, in particular, play a crucial role in minimising errors and supporting accurate clinical decisions.(Alotaibi & Federico, 2017).

Several studies have revealed key assumptions in the fields of patient safety and quality of service. For example, several studies have emphasised the important role played by healthcare providers in patient safety incidents. For example, stress and physician errors are often identified as significant causal factors of such incidents. Medication errors, which are often attributed to healthcare providers, are commonly categorised as safety incidents. Although technology-based approaches are recognised as improving patient safety, research into the barriers to implementing technology at various healthcare system levels is still limited. These barriers include a lack of leadership and administrative support, inconsistent government regulations, and insufficient financial backing (Russ & Sevdalis, 2020).

Current research on patient safety is increasingly adopting a holistic approach that combines human, organisational, and technological factors to improve patient safety. One example of this shift is adopting the High Reliability Organisations (HROs) concept in healthcare settings, particularly in hospitals settings, to foster a robust safety culture (Sullivan et al., 2016). AI-based predictive analytics can proactively identify potential hazards and optimise resource allocation, thereby improving clinical outcomes and patient safety. AI algorithms and the

integration of IoT sensors enable continuous patient monitoring, which is critical for the early detection of health problems and timely intervention(Park & Kang, 2024).

This study aims to address this gap by conducting a systematic review of trends and developments in patient safety and quality of service research from 2015 to 2024, answering several key questions.

Research Questions

RQ1. How has the thematic development and intellectual structure of global research on patient safety and healthcare service quality evolved during the period 2015–2024?

RQ2. What are the main research clusters, dominant topics, and shifts in methodological approaches identified in the bibliometric analysis of patient safety and quality of service?

RQ3. What are the key barriers to implementing patient safety technologies in primary healthcare facilities, particulary in low-resource settings?

The objectives of this study will be divided into several main sections to achieve them. Firstly, the introduction will explain the background of the problem, why this study is important, and its scope. Secondly, the research methodology section will describe the approach adopted and the data collection and analysis methods. The analysis and discussion section will present the research findings and compare them with those of previous studies. Finally, the conclusions and recommendations section will summarise the research results and offer suggestions for improving the quality of health services and patient safety.

MATERIAL AND METHODS

Research Design

This study employed a bibliometric analysis to systematically map and analyse research trends, thematic structure and intellectual developments in the field of patient safety and quality of service. Bibliometric methods enable the quantitative evaluation of scientific literature and facilitate the visualisation of research patterns, collaboration networks, and thematic evoluation over time (Haddow, 2018; Hassan & Duarte, 2024; Jayaratne & Zwahlen, 2015; Kumari & Swain, 2021; Ninkov et al., 2022; Salini, 2012).

Data Source and Search Strategy

The data were retrieved from the Scopus database, selected due to its broad coverage of peer-reviewed journals and relevance for bibliometric studies. The search was conducted using the following query : “Patient Safety and Quality of Service”

This search was limited to journal articles published in English between 1 January 2015 and 30 December 2024 to capture recent developments and emerging trends in the literature

Inlucsion and Exclusion Criteria

Articles were included if they :

1. Focused on patient safety and/or quality of healthcare services
2. Were peer-reviewed journal articles
3. Contained complete bibliographic information, including abstracts and keywords.

Articles were excluded if they:

1. Were conference papers, editorials, commentaries, or book chapters
2. Lacked essential bibliometric data (e.g., abstracts or keywords)
3. Were not relevant to the study’s thematic focus

Data Extraction and Processing

The bibliographic data were exported from scopus in CSV format, including information on authors, publication year, journal, country of origin, keywords, and abstracts. Initial screening was conducted by reviewing titles and abstracts to ensure relevance. Full texts were consulted when abstracts did not provide sufficient information.

Bibliometric Analysis Tools

The analysis was conducted using

VOSviewer and R Studio

VOsviewer was used to :

1. Visualise keyword co-occurrence networks
2. Identify research clusters

3. Analyse temporal trends and term density

R Studio was employed to support quantitative analysis, including publication trends and descriptive statistics

Network Visualisation Procedures

Keyword co-occurrence analysis was performed to identify thematic relationships among publications. Nodes in the visualisation represent keywords, while links indicate co-occurrence strength. Clusters were automatically generated by VOSviewer based on thematic similarity and represented using different colours. Density visualisation was applied highlight dominant and emerging research topics.

Analytical Framework

Articles served as the unit of analysis. Research themes were identified. Based on frequently co-occurring keywords and shared conceptual assumptions. The analysis focused on:

- Thematic development over time;
- Dominant research cluster
- Shifts in methodological and conceptual approaches

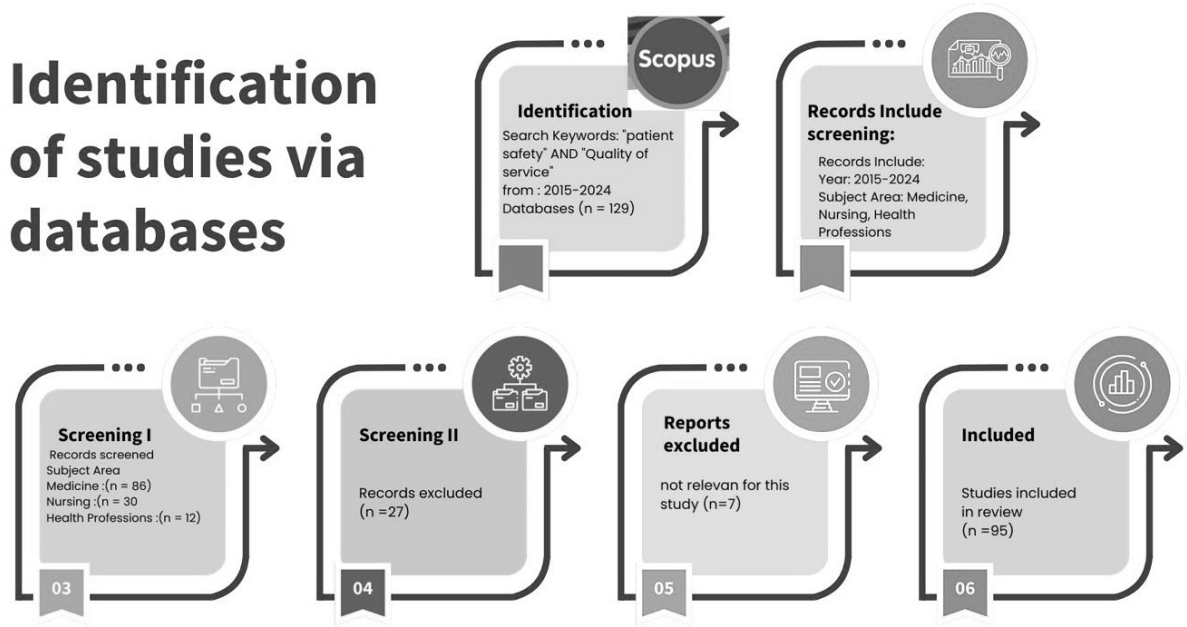
This approach enables a comprehensive overview of the intellectual structure and evolution of research on patient safety and quality of service during the study period.

Additionally, bibliometric analysis (VOSviewer) examines the content of existing articles or literature (e.g., underlying concepts, themes, and contexts of existing research). It identifies reasons or trends that may not be apparent from numerical data alone. Using this method, we analysed the literature by reading all Scopus articles relevant to the topic of 'Patient Safety and Quality of Service', and then categorising them.

This study aims to provide a comprehensive overview of patterns observed in scientific publications. It will identify trends in developing topics, analyse the number of publications per year to indicate academic development, and examine collaboration between authors. Additionally, the study will categorise articles based on the main themes discussed through the methodological approaches used (quantitative, qualitative, and mixed methods). This study is expected to provide insight into the direction of research development and contribute to further research.

Articles and research topics are analysed based on how often they use the same keywords and key assumptions as other articles. Articles are the basic unit of analysis. The software used to visualise the data is VOSviewer. R Studio and VOSviewer are the bibliometric tools that facilitate efficient quantitative analysis and network visualisation. The data is a CSV file of Scopus search results, analysed quantitatively using a bibliometric approach. Our study forms a database using publication data from Scopus for articles from 1 January 2015 to 30 December 2024. The author considered using references from the last 10 years for the following reasons: first, to review the latest trends or issues being discussed, allowing for novel and useful contributions.

The stages involved in collecting data include reviewing an article's title and abstract to establish its relevance to the research. The full article is examined if the abstract does not provide sufficient information. Articles without important bibliometric details, such as abstracts or keywords, are excluded from the analysis. Consequently, some articles that are unrelated to the research topic are excluded. The following outlines the data collection process in this study.



RESULTS AND DISCUSSION

Studies of patient safety and quality of service are essential components of healthcare delivery (Bigham & Patterson, 2015). Ensuring patient safety involves preventing and reducing adverse events, whereas improving the quality of care focuses on the overall experience and outcomes of healthcare delivery (Kim, 2022).Various interventions aim to prevent adverse events, such as developing safety indicators, risk adjustment techniques and tools for analysing safety incidents. Effective communication and teamwork are vital for the success of these interventions.

3.1. General information, Publication by Year and Country

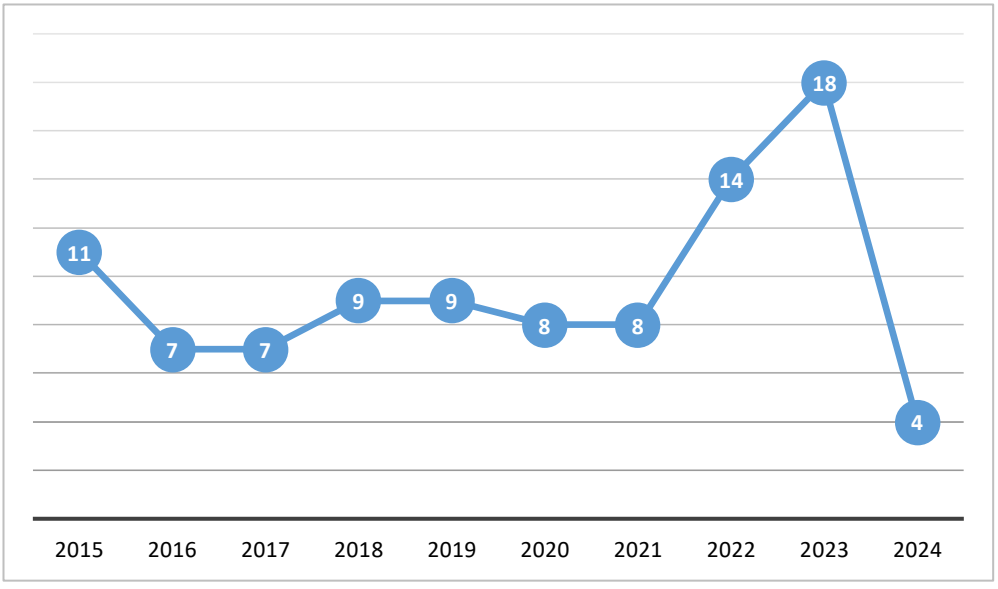


Fig 3.1. Publication by Year
Source from Scopus processed by the author excel

At the start of the period (in 2015), the number of publications was still relatively low. However, from 2016 to 2021, there was an increase in the number of publications. The highest peak in the number of publications occurred in 2023, after which there

was a drastic decline in 2024. This reflects the fluctuating dynamics of academic interest from year to year. Furthermore, the publication trend is spread across several countries **(Fig. 3.2).** This research has been widely developed and applied in countries with advanced healthcare systems and robust labour regulations, including Iran, the United States, the United Kingdom, India, and Indonesia. These countries generally pay close attention to implementing patient safety standards and improving the quality of health services provided to patients, which is in line with the need to maintain service quality and reduce medical risks.

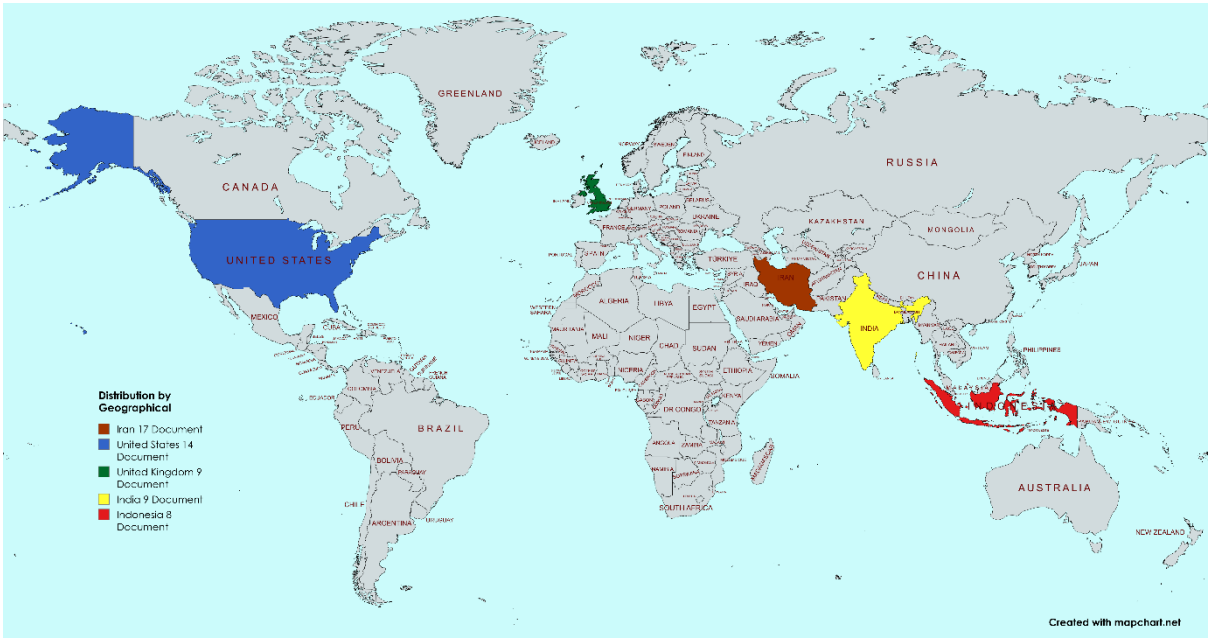


Fig 3.2. Distribution by Geographical
Source: Data obtained from the Scopus database and further analyzed using the web-based tool mapchat.net

The geographical distribution of publications on patient safety and quality of service shows that most studies originate from countries with advanced healthcare systems and robust labour regulations, including Iran, the United States, the United Kingdom, India, and Indonesia. This is evident from the extensive focus on these regions in the literature (Braithwaite et al., 2016; Rechel et al., 2016; Satrya et al., 2018). In countries such as the United States and the United Kingdom, most studies reveal information technology (IT) use in healthcare. This includes implementing electronic health records, telemedicine, and other eHealth technologies to improve patient care and safety (AlGhamdi, 2015; Paul & Das, 2017; Steele Gray et al., 2016). In these countries, the implementation of information technology is driven by the need to improve the efficiency and effectiveness of health service delivery, reduce medical errors, and enhance patient outcomes (Zema et al., 2015). In Iran and India, however, there is a greater focus on safety culture and health worker involvement (Yari et al., 2019). Indonesia has begun to pay increasing attention to patient safety culture by implementing several national policies to improve patient safety. These include Health Law No. 36 of 2009 and Minister of Health Regulation 11 of 2017, emphasizing patient safety management activities based on international standards (Herdiman et al., 2023; Hermawan & Blakely, 2017).

3.2. Publication by relevance

Table 3.1 presents five highly relevant publications that reflect dominant themes in patient safety and quality of service research across different healthcare contexts. Although conducted in diverse countries-including Turkey, Iran, Indonesia, and Dlovakia-the selected studies reveal consistent

patterns in the determinants of patient safety.

Across these studies, patient safety culture, communication among healthcare professional, and managerial support emerge as central factors influencing the quality and safety of healthcare services. Quantitative survey-based studies highlight the role of organisational climate and leadership commitment, while qualitative approaches provide deeper insights into interpersonal communication, professional attitudes, and contextual challenges faced by healthcare workers.

The convergence of findings across different geographical and methodological contexts suggests that patient safety challenges are systematic and global, rather than context-specific. These results indicate that improving patient safety requires not only technical interventions and clinical protocols, but also humand-centered and organisational strategies that strengthen communication, teamwork, and safety culture.

From a research perspective, these insights underscore the need for future patient safety studies to move beyond isolated clinical outcomes and place greater emphasis on organisational behaviour, cultural factors, and leadership practices. This particularly important for healthcare systems in low-and-middle-income countries, where structural limitations may amplify the impact of organisational and human factore on patient safety outcomes.

Table 3.1. Publication by relevance: Topic in Patient Safety and Quality of Service

Rank	Author/Year/ Document title	Source	Konteks
1	(Manav & Karademirler, 2018). Patient safety culture	Guncel Pediatri	Turki
2	(Akbary et al., 2015). A survey of patient safety culture: A tool for improving patient safety in healthcare providers service organizations	Iran Occupational Health	Iran
3	(Noviyanti et al., 2021). Exploring the relationship between nurses' communication satisfaction and patient safety culture	Journal of Public HealthResearch	Indonesia
4	(Behzad & Elahe, 2023). Patient Safety Culture and Spiritual Health in the Operating Room: An Iranian Exploratory Qualitative Study	Journal of Religion and Health	Iran
5	(Júlia et al., 2023b). Culture of Patient Safety in Selected Medical Facilities	Zdravotnicke Listy	Slovakia

This review analyses five articles significantly contributing to our understanding of patient safety culture and hospital service quality.

The first article, by (Manav & Karademirler, 2018), examines medical staff perceptions of patient safety culture in a paediatric hospital in Turkey. The authors found that, although a patient safety culture exists, its implementation is moderate, emphasising the need to improve internal communication and staff training. This underscores the importance of communication in creating a safe environment for patients. The second article (Akbary et al., 2015) assesses patient safety culture in Iran, particularly regarding open communication and managerial support, which were found to be inadequate. This article strengthens the existing literature by emphasising the importance of open communication and the role of management in building an effective safety culture.

Furthermore, (Noviyanti et al., 2021) examined the relationship between nurse communication satisfaction and patient safety culture in Indonesia, demonstrating a positive correlation. This study enriches the bibliometric map with the keyword 'nurse communication' and reflects the importance of interpersonal aspects in creating an effective patient safety culture. More broadly, (Behzad & Elahe, 2023) explore the relationship between patient safety culture and the spiritual health of medical personnel in operating rooms in Iran, introducing a new

dimension to this study. The authors found that spirituality significantly influences the attitudes and decisions of medical personnel, thereby broadening our understanding of the factors that influence clinical safety.

The latest article by (Júlia et al., 2023) examines the evaluation of patient safety culture in Slovakian medical facilities, revealing variations in the perception of safety culture across medical service units. These findings emphasise the importance of organisational structure and staff training in influencing the implementation of safety culture across units. Together, these five articles provide deeper insights into the factors affecting the quality of hospital services, including communication, managerial support, and the spiritual dimension. Additionally, this study includes developing countries such as Iran and Indonesia, enriching the global literature by demonstrating that challenges related to implementing patient safety culture are present in developed and developing countries

This analysis clearly shows that the 'patient safety culture' theme is central to this body of literature, with keywords such as 'safety culture', 'communication', and 'management support' dominating the bibliometric map. Adopting a more interdisciplinary approach, such as that offered by research on spirituality, provides new perspectives that broaden the scope of patient safety research. Thus, this study enriches the patient safety literature and opens up space for further research linking social, cultural, and organisational factors in a health context.

3.3. Network Visualization of Patient Safety and Quality of Service Concept Using VOSviewer

Figure 4 Figure 4 presents a network visualisation of the bibliometric analysis results using VOSviewer software, illustrating the relationships between keywords related to patient safety and quality of service. Each node represents a frequently occurring keyword, while the lines connecting the nodes indicate the strength of the relationship or co-occurrence of the keywords within a document. Clusters automatically formed based on thematic relationships are marked in different colours, reflecting the main focus areas in this study. Table 3.2 below briefly interprets each cluster based on its colour, main keywords, and a short description.

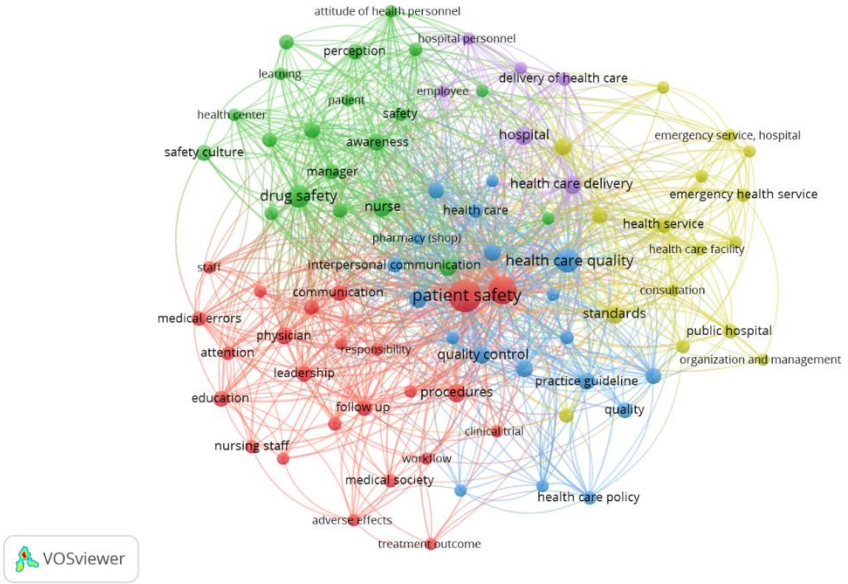


Figure 3.3. Network Visualization of Patient Safety and Quality of Service
Source: Processed by Author Using VOSviewer

Table 3.2. Cluster interpretation based on patient safety and service quality network visualisation

Cluster color	Main focus	Keywords	Short explanation
Red	Clinical Interactions and Human Factors Focuses on human factors in healthcare.	Patient safety, communication, medical errors, physicians, nursing staff, education, leadership, responsibility, interpersonal communication, follow-up, attention	This cluster emphasizes and the role of healthcare professionals in patient safety. It highlights how medical errors can be reduced through education, leadership, and improved interpersonal communication.
Green	Safety Culture and Perception	safety culture, organizational culture, patient safety, perception, attitudes of healthcare personnel, awareness, hospital management learning	This cluster describes the significance of organizational culture and individual perceptions in shaping patient safety practices. Managerial support and healthcare worker engagement play a critical role in the development and implementation of a strong safety culture.
Blue	The quality of care provided and the clinical procedures involved are of paramount	healthcare quality, quality control, procedures, practice guidelines, clinical trial, workflow, standards, treatment outcomes	The cluster emphasizes the importance of implementing quality standards and clinical practice guidelines within healthcare systems. Effecttive clinical; procedures are essential to ensuring both patient safety and optimal treatment outcomes.
Yellow	healthcare systems and organizational management.	health care delivery, emergency health service, health service, consultation, organization and management, public hospital, health care facility, standards	The cluster focuses on the design and organization of healthcare systems, particularly within hospital and emergency service settings. It underscores the pivotal role of organizational management in ensuring the quality and safety of healthcare delivery.
Purple	Hospital institutions and healthcare workforce.	hospitals, healthcare delivery, health personnel, employees, hospital staff, workforce	This cluster represents the structural aspects of hospital institutions and the healthcare workforce that support service delivery. Despite its relatively modest size, this cluster plays a crucial role in managing direct healthcare services within health facilities.

The subject of Patient Safety and Quality of Service demonstrates that patient safety is a complex and multidimensional issue. The clustering results yielded five primary clusters, interconnected and delineating various salient aspects of health services.

The initial cluster, 'Red', emphasizes clinical interaction and human factors. Patient safety is significantly influenced by the quality of communication between healthcare professionals, such as doctors and nurses, and how they manage responsibilities, leadership, and clinical education

(Al-Sheikh & Iqbal, 2020). Medical errors are frequently attributable to deficiencies in effective communication and coordination during service follow-up(Al-Sheikh & Iqbal, 2020; Cima & Deschamps, 2013; Kling, 2018; Rodriguez-Saldana, 2015). This underscores the significance of a humanistic approach in clinical practice.

Conversely, the second cluster (Green) underscores the significance of safety culture and organisational perception. Factors such as health workers' perceptions, attitudes, awareness, and manager involvement in creating a culture of safety are pivotal to the successful implementation of a patient safety system (Fontes-Mota & Ribeiro, 2022; Huang et al., 2024; Lin & Lou, 2022). A supportive organisational culture has been demonstrated to reinforce positive behaviour in healthcare settings (Smith et al., 2022).

The third cluster (Blue) focuses on service quality and implementation of clinical procedures. Implementing quality standards, quality control, and evidence-based clinical practice guidelines is imperative to ensure optimal and safe treatment outcomes. This process has been shown to enhance work efficiency and reduce variation in medical services. The fourth cluster (Yellow) relates to the service system and structure of the health organisation. The hospital service system, incorporating organisational management and emergency services, significantly influences the effectiveness and safety of services (TIRITEU et al., 2024). Without a robust system, there is a risk of declining service quality and increasing patient risks.

Finally, the fifth cluster (Purple) displays the role of hospital institutions and workers as the primary implementers of health services. The quality of service is predominantly influenced by the level of institutional support and the presence of qualified human resources. This demonstrates that patient safety is not solely the responsibility of individual practitioners, but also an institutional obligation (Bigham & Patterson, 2015; Chibana, 2024).

Evidently, the five clusters collectively engender a comprehensive comprehension of patient safety. The synergy between medical personnel, organisational culture, service quality, service systems, and institutional support is pivotal in ensuring safe and effective health services. It is imperative to comprehend the interrelationship between these components to formulate more strategic interventions to enhance the safety and quality of health services

3.4. Research Trends in Patient Safety and Quality of Service" (2016–2024)

Figure 3.4 visualizes research trends in Patient Safety and Quality of Service from 2016 to 2024, analysed using VOSviewer software. The map illustrates the interrelationships between topics through a network of interconnected keywords, where the size and colour of the dots reflect the frequency and temporal development of each topic. The colour coding system employed in this study utilises yellow to denote recent research trends, while blue signifies subjects that were predominant in the initial phase. The primary focus of this map is on terms such as patient safety, healthcare quality, and nurse, indicating that patient safety and the role of health workers remain central to academic discourse. Moreover, the emergence of novel subjects such as emergency health services and public hospitals, which have appeared in recent years, is indicative of the research response to the evolving dynamics of health services.

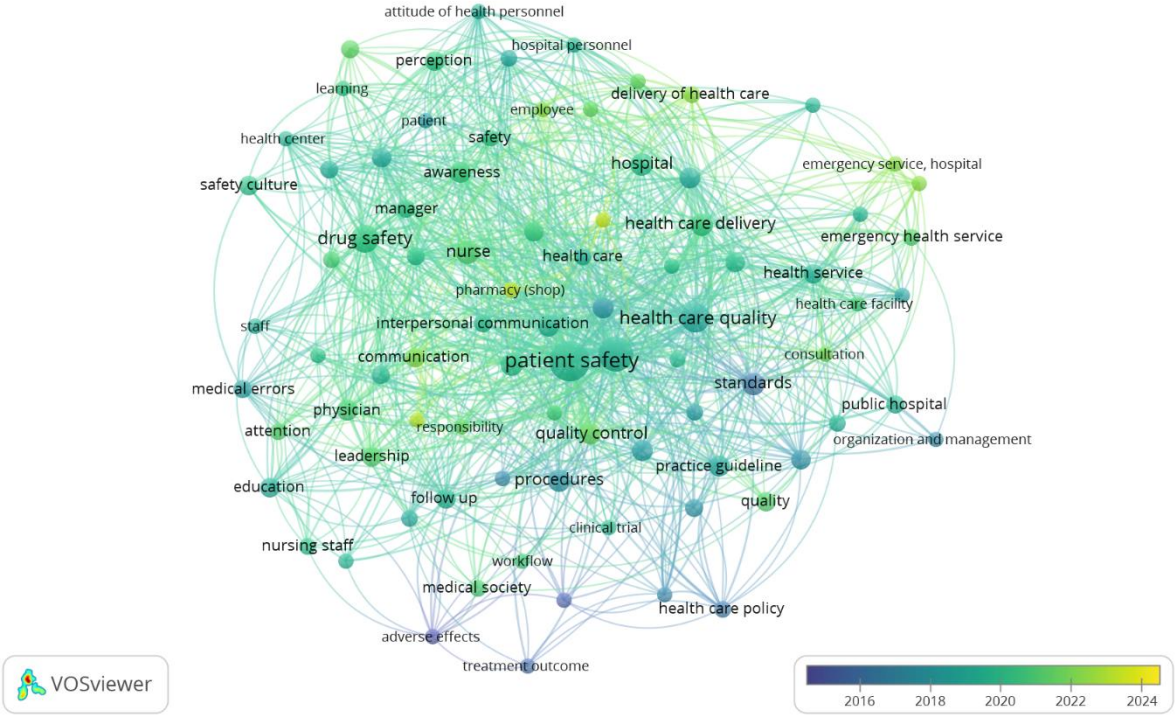


Figure 3.4. Research trend in Patient Safety and Quality of Service
Source: Processed by Author Using VOSviewer)

As demonstrated in Figure 3.4, the discourse surrounding Patient Safety and Quality of Service markedly evolved from 2016 to 2024. The colour of the visualisation indicates the emergence of the topic in that given year, with purple signifying 2016, yellow 2024, and so forth.

3.4.1. The initial phase of the project commenced in 2016 and concluded in 2018.

In the early period, the emerging research topics focused on treatment outcomes, workflow, clinical trials, and medical societies. The subjects under discussion pertain to evaluating clinical outcomes, medical trials, and formal service procedures. The findings of this study demonstrate that the initial phase of the Patient Safety and Quality of Service study concentrated on technical medical outcomes and the efficacy of clinical interventions as the primary indicators of service quality and patient safety(Brown et al., 2016; Ghahramanian et al., 2017; Singh & Sittig, 2016; Waring et al., 2016).

3.4.2. The Intermediate Period (2019–2021)

Emerging topics relate to organisational and service systems (Azyabi et al., 2021; Khoshakhlagh et al., 2019; Ullah et al., 2021; Waterson et al., 2019). Keywords that emerged include quality control, standards, organisation and management, public hospitals, and practice guidelines. These keywords highlight the importance of regulation, quality management, and institutional policies in ensuring patient safety. The focus shifted from the individual clinician to the system and institution.

3.4.3. Current period (2022–2024):

Studies in this period focus on awareness, safety culture, perception, health services, interpersonal communication, and employees (Afework et al., 2023; Bernal et al., 2023). These findings confirm the importance of human behaviour, interpersonal communication, and organisational culture in creating optimal patient safety.

In general, the trend in studies of patient safety and quality of service shows a shift from a technical and clinical approach to a more systemic approach that considers

social and cultural dimensions. Understanding of patient safety continues to evolve alongside the complexity of modern health services, which combine clinical, managerial, and psychosocial factors.

Table 3.3. Summary of Dominant Topics and Keywords by Publication Year

Year Period	Dominant Topic	Main Keywords
2015–2017	The present study will proceed with an evaluation of clinical procedures and clinical trials.	Treatment outcome, workflow, clinical trial
2018–2020	service quality and procedure standardization.	quality control, standards, SOP
2021–2022	Hospital Management & Organization Safety culture, Communication and human resources	organization, public hospital, health facility
2023–2024	safety culture, communication and human resources.	safety culture, awareness, communication, employee

3.5. Density Visualisation Analysis: Patient Safety and Quality of Service

This visualisation shows that patient safety is closely related to the quality of service, effective interpersonal communication, and consistent implementation of procedures in healthcare facilities. This finding indicates that patient safety is a major issue with various supporting factors, ranging from human resources (such as nurses and medical staff) and service processes (communication, procedures, and quality control) to hospital management systems. Integrating all these aspects is crucial for ensuring health services prioritize patient safety. Patient safety is the main focus of the literature. Figure 3.5 shows the frequency of occurrence and the relationship between keywords. Keywords such as 'health service quality', 'interpersonal communication', 'quality control', 'procedures', and 'hospitals' appear frequently

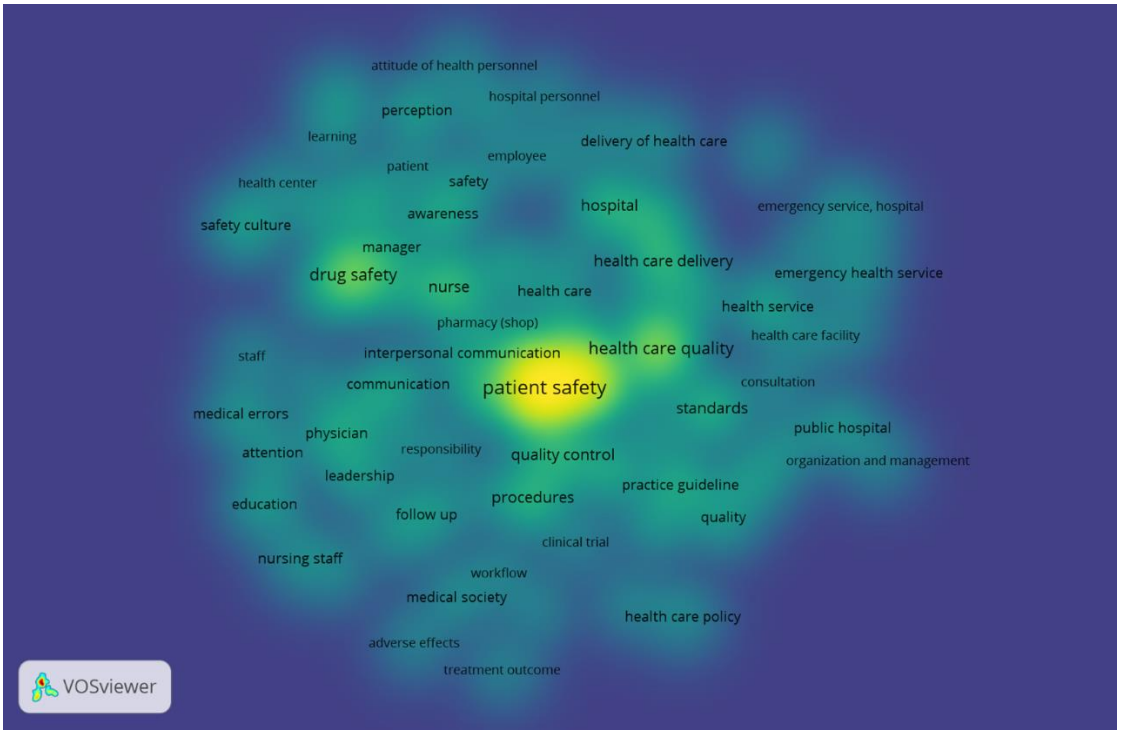


Figure 3.5. Heatmap Bibliometric Analysis of Patient Safety and Quality of Service
Source: Processed by Author Using VOSviewer

Furthermore, keywords such as nurse, drug safety, awareness, safety culture, and hospital illustrate that the role of health workers, especially nurses, and organizational factors such as safety culture and individual understanding of medical risks are important in creating safe and quality services. At the same time, keywords such as clinical trial, workflow, medical society, treatment outcome, and health care policy show that the topic is still limited or inadequate in the literature debate. Therefore, the topic becomes an opportunity for the next research agenda and a strong theoretical novelty.

DISCUSSION

This bibliometric analysis reveals a clear shift in the scholarly understanding of patient safety and quality of service between 2015 and 2024. Rather than being framed solely as a technical or procedural concern, patient safety is increasingly conceptualised as a multidimensional phenomenon shaped by human factors, organisational culture, system design, and institutional capacity. The identification of five interconnected clusters reflects the growing recognition that sustainable patient safety improvements require integrated socio-technical approaches rather than isolated clinical interventions

4.1 Human factors and communication as determinants of safety

The prominence of communication-related themes in the first cluster highlights the persistent vulnerability of healthcare systems to human factors. Ineffective communication among healthcare professionals continues to be a major contributor to adverse events, particularly in complex and high-pressure hospital environments. This finding is consistent with prior studies emphasising that breakdowns in interpersonal communication undermine teamwork, situational awareness, and clinical decision-making.

Beyond identifying communication as a risk factor, the literature increasingly frames communication as a core organisational competency rather than an individual skill. Studies focusing on nurses' communication satisfaction and leadership support suggest that communication effectiveness is strongly influenced by organisational climate and professional hierarchies (Noviyanti et al., 2021).This implies that interventions aimed at improving patient safety should move beyond individual training programs and address broader structural and cultural determinants of professional interaction.

4.2 Organisational culture as a mediating mechanism

The second cluster underscores organisational culture as a critical mediator between safety policies and their practical implementation. The frequent association between safety culture, perception, awareness, and managerial support indicates that patient safety systems are most effective when embedded within a supportive organisational environment. This finding aligns with previous research demonstrating that leadership engagement and shared safety values significantly influence reporting behaviours and adherence to safety protocols (Abuosi et al., 2022; Aouicha et al., 2022; Mrayyan, 2022; Yesilyaprak & Demir Korkmaz, 2023).

Importantly, the emphasis on learning, perception, and attitude reflects a shift toward proactive and preventive safety strategies. Rather than reacting to adverse events, healthcare organisations are increasingly encouraged to foster psychological safety, continuous learning, and open communication. Such cultural attributes have been shown to reinforce positive safety behaviours and reduce blame-oriented responses to error (Smith et al., 2022). This reinforces the argument that safety culture should be viewed not as a supplementary component, but as a foundational element of patient safety systems.

4.3 Clinical procedures: necessary but insufficient

The third cluster confirms the enduring importance of clinical procedures, practice guidelines, and quality control mechanisms in safeguarding patient outcomes. Standardisation of care processes remains a fundamental strategy for reducing variability and improving service quality. However, the literature also consistently highlights the

limitations of procedural approaches when implemented in isolation.

Several studies indicate that clinical guidelines and health information technologies are only effective when supported by adequate training, leadership commitment, and cultural readiness for change (Alotaibi & Federico, 2017). This suggests that technical solutions alone cannot compensate for organisational deficiencies. Consequently, patient safety initiatives should integrate procedural compliance with behavioural reinforcement and organisational learning to achieve sustained impact.

4.4 Health system structure and organisational design

The fourth cluster draws attention to the influence of health system structure and organisational design on patient safety outcomes. Research focusing on public hospitals, emergency services, and healthcare delivery systems highlights how regulatory frameworks, resource allocation, and infrastructure capacity shape the feasibility of safety interventions. This issue is particularly salient in low- and middle-income countries, where systemic constraints may exacerbate safety risks.

Consistent with WHO reports (2021), studies from developing contexts emphasise challenges such as limited data systems, workforce shortages, and fragmented governance structures. These findings suggest that patient safety strategies must be context-sensitive and aligned with broader health system strengthening efforts. Without robust organisational systems, even well-designed safety policies may fail to translate into practice

4.5 Institutional responsibility and workforce capacity

The fifth cluster reflects an evolving recognition of patient safety as a shared institutional responsibility rather than an individual obligation. The increasing focus on workforce capacity, institutional support, and organisational accountability highlights the central role of healthcare institutions in shaping safety outcomes. Qualified human resources, adequate staffing, and institutional commitment emerge as critical enablers of safe service delivery.

This perspective reinforces earlier arguments that patient safety cannot be achieved solely through individual professionalism or clinical competence. Instead, it requires coordinated institutional strategies that align human resource management, leadership practices, and organisational values (Bigham & Patterson, 2015; Chibana, 2024). The shift toward a more humanistic and systems-oriented discourse reflects the maturation of patient safety research over the past decade.

4.6 Theoretical implications

The findings of this study extend the Donabedian framework by highlighting the central role of organisational behaviour and culture in linking structure, process, and outcomes. While the traditional model provides a robust foundation for evaluating healthcare quality, it does not explicitly account for the socio-organisational dynamics that influence implementation. By incorporating cultural and behavioural dimensions, this study contributes to a more comprehensive and context-sensitive understanding of patient safety

This expanded perspective acknowledges that structural resources and clinical processes are mediated by human interaction, leadership, and organisational norms. As healthcare systems grow increasingly complex, integrating these dimensions into quality evaluation frameworks becomes essential for both research and practice

This study strengthens the Donabedian Model (structure–process—outcome) by incorporating organizational behaviour and culture, which are often overlooked in formal frameworks.

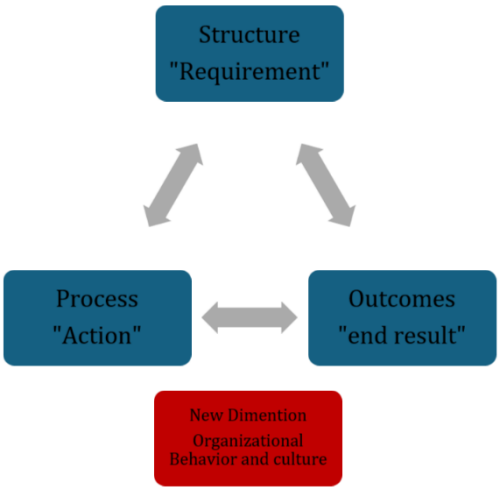


Figure 4.1. The Donabedian Model as a framework for evaluating healthcare quality
Source: Adoption from (Tossaint-Schoenmakers et al., 2021)

Including organisational behaviour and culture in the Donabedian model helps to develop a framework for evaluating the quality of health services. Traditionally, the Donabedian model has relied on three main components: structure, process, and outcome. However, this study shows that the development of modern organisations demonstrates the significant influence of organisational behaviour and work culture on the successful implementation of processes and achieving expected results. By incorporating the organisational behaviour and culture dimension, this model can evaluate service quality not only technically and administratively, but also in terms of non-technical factors affecting overall quality, such as employee motivation, internal communication, organisational values, and collective behavioural norms. These dimensions reinforce or inhibit factors in the connection between structure, process, and outcomes. Consequently, the Model becomes more adaptive to complex social and organisational contexts and more relevant for application to health institutions with diverse work

CONCLUSION

This bibliometric review provides a comprehensive overview of the intellectual landscape of research on patient safety and healthcare quality over the past decade (2015–2024). The analysis identifies five main clusters reflecting a paradigm shift from a technical-clinical approach to a more systemic, human-centred one. Key emerging themes include communication, organisational culture, and the role of healthcare workers in shaping service safety.

Theoretically, this study builds upon Donabedian's framework by incorporating behavioural and organisational cultural dimensions as integral elements that bridge the gap between structure, service processes, and patient outcomes. This expanded Model reflects the socio-technical complexity of modern health systems, responding to the need for an interdisciplinary approach in health services research.

5.1 Research limitations

This study has several limitations. First, although Scopus is a comprehensive database, it may not capture all relevant publications indexed in other databases such as Web of Science, PubMed, or regional repositories. Second, the bibliometric approach emphasises keyword frequency and citation patterns, which may not fully reflect the methodological rigour or theoretical depth of individual studies. Third, restricting the analysis to English-language publications may have excluded significant contributions from non-English-speaking countries. Finally, the static visualisation provided by VOSviewer may not fully represent the dynamic evolution of research themes over time.

5.6. Future research

Future research should further examine how organisational culture and behavioural dimensions influence clinical practice, workflow systems, and healthcare policy implementation. Longitudinal and mixed-method approaches are recommended to explore how patient safety initiatives evolve within dynamic healthcare environments. Expanding bibliometric analyses to include multiple databases and non-English literature would also provide a more comprehensive global perspective

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