



REVISIONS

Bibliometric Analysis of Publications in Scopus on the Evaluation of Patient Safety Culture

Análisis bibliométrico de publicaciones en Scopus sobre evaluación de la Cultura de Seguridad del Paciente

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ABSTRACT:

Introduction: Patient safety culture is a key element in improving healthcare quality, as it directly influences the prevention of adverse events

Aim: To identify the main research evaluating patient safety culture between 2014 and the first quarter of 2024.

Materials and Methods: A descriptive bibliometric analysis was conducted using data from the Scopus database and VOS viewer 1.6.20 software to analyze scientific production, co-authorship networks, and institutional leadership.

Results: The results show a significant increase in publications since 2020, coinciding with the COVID-19 pandemic. A total of 93.5% of the studies employ a quantitative approach, with the Hospital Survey on Patient Safety Culture (HSOPSC) being the most frequently used tool for measuring patient safety culture. The United States, China, and Spain lead scientific production in this field, while participation from Latin American countries remains limited. The analysis also highlights the importance of organizational processes and continuous quality improvement in evaluating patient safety culture. Moreover, a predominance of collaborative work is observed, indicating that interdisciplinary research is crucial for advancing in this area.

Conclusion: There is an upward trend in publications, collaborative work for scientific development, and low participation from Latin American countries. A preference for quantitative studies over qualitative or mixed-method research is evident among authors.

Keywords: patient safety, organizational culture, bibliometrics.

RESUMEN:

Introducción: La Cultura de Seguridad del paciente es un elemento clave en la mejora de la calidad en los sistemas de salud, ya que influye directamente en la prevención de eventos adversos.

Objetivo: Identificar las principales investigaciones que evalúan la Cultura de Seguridad del paciente entre 2014 y el primer trimestre de 2024.

Materiales y métodos: Se realizó un análisis bibliométrico descriptivo utilizando datos de la base de datos Scopus y el software VOS viewer 1.6.20 para analizar la producción científica, redes de coautoría y liderazgo institucional.

Resultados: Los resultados indican un aumento significativo en la publicación de estudios desde 2020, coincidiendo con la pandemia de COVID-19. El 93.5% de las investigaciones emplean un enfoque cuantitativo, siendo el instrumento Hospital Survey on Patient Safety Culture el más utilizado para medir la Cultura de Seguridad del paciente. Estados Unidos, China y España lideran la producción científica en este campo, mientras que la participación de países latinoamericanos es limitada. El análisis también destaca la importancia de los procesos organizacionales y la mejora continua de la calidad en la evaluación de la cultura de seguridad. Además, se observa un predominio de trabajos colaborativos, lo que sugiere que la investigación interdisciplinaria es esencial para avanzar en este ámbito.

Conclusión: Existe un comportamiento ascendente de la publicación, un trabajo colaborativo para el desarrollo científico y una baja participación de los países latinoamericanos. Se evidencia una preferencia de los autores por los estudios cuantitativos sobre las investigaciones cualitativas o mixtas.

Palabras claves: Seguridad del Paciente, cultura organizacional, bibliometría.

INTRODUCTION

Patient Safety is a fundamental component of healthcare that aims to prevent the occurrence of adverse events and minimize their complications ⁽¹⁾. Thus, it is considered a key dimension of quality in healthcare delivery, achieved through the promotion and implementation of safe practices, continuous training of healthcare personnel and students, and ongoing efforts in governmental and institutional management ⁽²⁾. Additionally, one of the key elements for achieving and strengthening Patient Safety is the safety culture. This culture comprises a set of attitudes, skills, perceptions, knowledge, and actions of individuals and groups that shape the way Patient Safety is approached ⁽³⁾. In this sense, it includes the norms that influence organizational behavior ⁽⁴⁾.

Therefore, Patient Safety Culture can be understood as the way an organization assumes this responsibility. This culture may be grounded in a positive outlook, where trust is placed in the effectiveness of both individual and collective actions, or in a punitive approach, focused on punishment, blame, sanctions, and correction rather than education. The latter approach fosters an environment of fear, mistrust, demotivation, and burnout, which ultimately affects the quality of health services.

In this context, studies have highlighted the importance of conducting evaluations of safety culture within healthcare settings. Such assessments allow for monitoring the impact of organizational strategies, contributing to the identification of strengths and weaknesses in promoting a fair Patient Safety Culture ⁽⁵⁻⁷⁾.

Numerous studies have explored Patient Safety Culture, generating a substantial body of information. In this context, it becomes crucial to gain a more specific understanding of this area of interest. Bibliometric studies are essential for analyzing trends in academic production, identifying patterns, and assessing the relevance and impact of published work. This approach enables a deeper understanding of the progress and opportunities within this field of research. Bibliometrics, as a key specialty, quantifies

scientific literature, identifying authors, research groups, institutions, and countries, as well as their structures and dynamics ⁽⁸⁾.

Consequently, the objective of this study was to identify the research conducted on the evaluation of Patient Safety Culture from 2014 to the first quarter of 2024. This effort allowed for the identification of recent or emerging research areas, key experts, and a real-time analysis of research trends, thereby consolidating relevant information ⁽⁹⁾.

MATERIALS AND METHODS

A descriptive study was conducted based on a bibliometric analysis of articles published over the last ten years in the Scopus database. This database was selected due to its comprehensiveness, reliability, and extensive data coverage, with approximately 84 million records and 17.6 million authors ⁽⁹⁾.

The search for articles was carried out in May 2024. Articles published between 2014 and the first quarter of 2024 in both English and Spanish were included. Additionally, original research published with open access, without geographical restrictions, was considered. Articles whose abstracts did not align with the current bibliometric analysis were excluded.

The search strategy followed the framework proposed by Gregorio-Chaviano et al., which consists of four stages: identification, screening, eligibility, and inclusion ⁽¹⁰⁾. The process is detailed as follows:

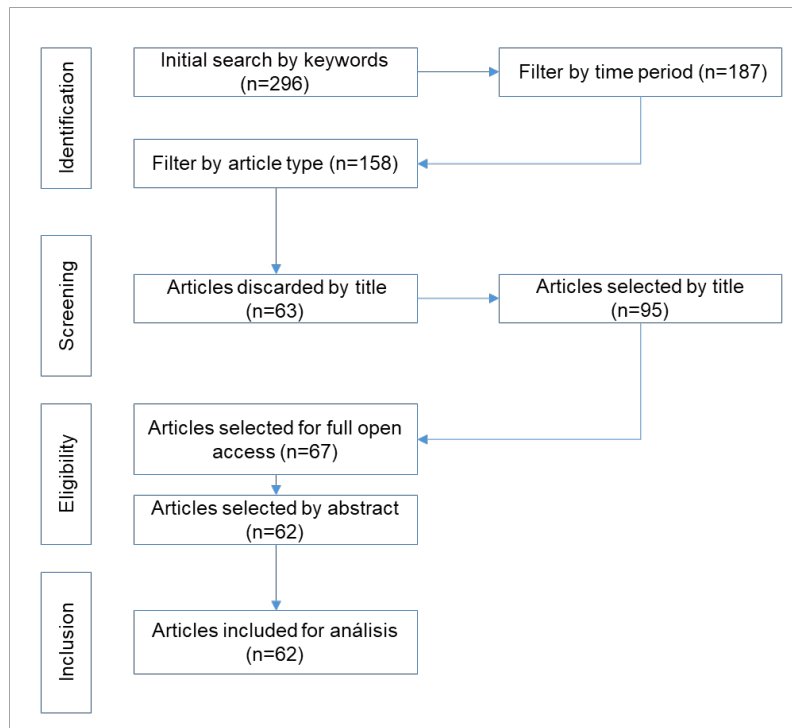
Identification: The initial search was conducted using the descriptors “Patient Safety” (Dec’s), “safety patient” (Mesh), and free terms in both English and Spanish such as “evaluación”, “assessment”, “cultura”, and “culture”, filtered by titles, abstracts, and keywords. This strategy retrieved 296 records. Subsequently, the data was filtered for the period from 2014 to the first quarter of 2024, resulting in 187 records.

Screening: Manuscripts categorized as reviews, editorials, book chapters, and letters to the editor were excluded, as they do not present original research findings and may not be relevant for identifying research trends. This reduced the number of records to 158 documents. Further screening of article titles led to the exclusion of 63 studies, leaving 95 documents.

Eligibility: Among these, documents with full open access were selected to allow comprehensive reading of the manuscript, totaling 67 articles with this characteristic. Abstracts were then reviewed to ensure alignment with the bibliometric analysis objective, resulting in 62 documents for bibliometric analysis.

Inclusion: A full review of the 62 documents was conducted to confirm their relevance to the bibliometric analysis objective. All 62 articles met this criterion (Figure 1).

Figure 1. Methodological process of identification, screening, eligibility, and inclusion



The data analysis was conducted using Scopus metrics (at the journal, article, and author levels) and the VOS viewer software version 1.6.20 to create bibliometric maps and identify co-authorship networks and co-occurrence networks ⁽¹¹⁾. The results were organized according to the bibliometric indicators established by Gregorio-Chaviano, which include publication trends, author productivity, co-authorship networks, journal productivity, and scientific leadership ⁽¹⁰⁾.

RESULTS

Publication Trends

The research output on the evaluation of Patient Safety Culture exhibited an upward trend during the analysis period, indicating a growing interest in this field of study. The highest concentration of research was observed during the COVID-19 pandemic, with 21% of publications in 2020 (n=13) and 16% in 2021 (n=10). This trend continued in subsequent years, with 18% of publications in 2022 (n=11) and 13% in 2023 (n=8). In contrast, no publications were recorded in 2016 or during the first quarter of 2024. There were few articles in 2014 and 2015 (Table 1).

Table 1. Publications per year in the Scopus database (2024)

Year	Number	Percentage
2024	0	0%
2023	8	13%
2022	11	18%
2021	10	16%
2020	13	21%
2019	6	10%
2018	6	10%

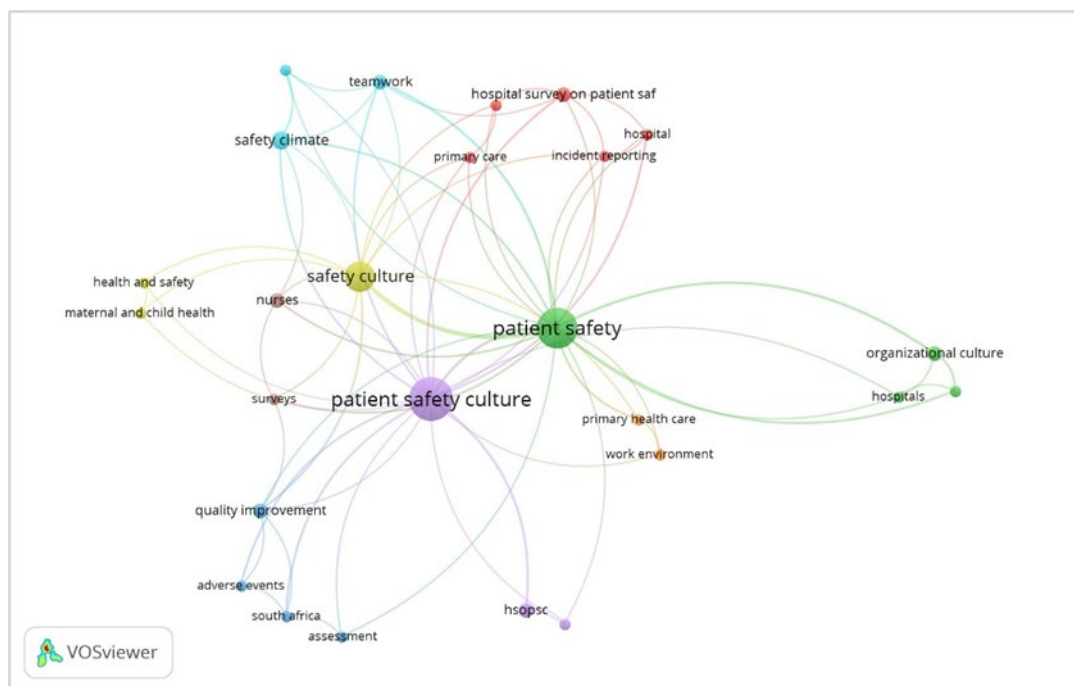
Year	Number	Percentage
2017	2	3%
2016	0	0%
2015	4	6%
2014	2	3%
Total	62	100%

Regarding the research approach, a predominance of quantitative research was observed (n=58), with an emphasis on the design, adaptation, and/or validation of new or existing scales for measuring Patient Safety Culture. Qualitative studies (n=2) were published in 2018 and 2023, while mixed-method studies (n=2) were published in 2015 and 2021.

To identify the areas of interest in the studies, the keywords of the articles were analyzed (Figure 2), revealing three central areas grouped into three clusters, which are depicted in Figure 2 in green, purple, and yellow: Patient Safety, Patient Safety Culture, and Safety Culture, respectively. Patient Safety is an area related to organizational culture in the hospital setting. To a lesser extent, interest in topics related to teamwork and safety climate was identified, showing a connection between Patient Safety and the organizational processes of institutions.

Regarding Patient Safety Culture, the studies show a clear trend toward using the Hospital Survey on Patient Safety Culture (HSOPSC) as the primary tool for evaluation. Additionally, the topic is closely linked with quality improvement and adverse event reduction. The Safety Culture cluster displayed a strong connection with the Patient Safety cluster, particularly in the maternal and child health population. Lastly, the analysis showed that research extends beyond hospital environments to include primary healthcare settings.

Figure 2. Areas of interest in research. Analysis conducted using VOS viewer software version 1.6.20.



Author Productivity

The analysis of author productivity revealed that, across the 62 articles analyzed, a total of 160 authors participated, indicating that numerous researchers are interested in the topic of Patient Safety Culture evaluation. However, there was no concentration of research output among specific authors, as the maximum number of publications by a single author was four articles. The most productive authors were Draganović Sehad from the University of Klagenfurt, Austria, and Offermanns Guido, affiliated with the Karl Landsteiner Society and the Institute for Hospital Organization in Austria (n=4, 1.2%). Notably, these two authors collaborated on the same four studies.

Regarding the impact of scientific production based on the number of citations, 2020 was the year with the highest impact, accounting for 30% of total citations, followed by 2018, 2017, and 2015, each with 20% (Table 2).

Table 2. Most impactful articles in the Scopus database (2024)

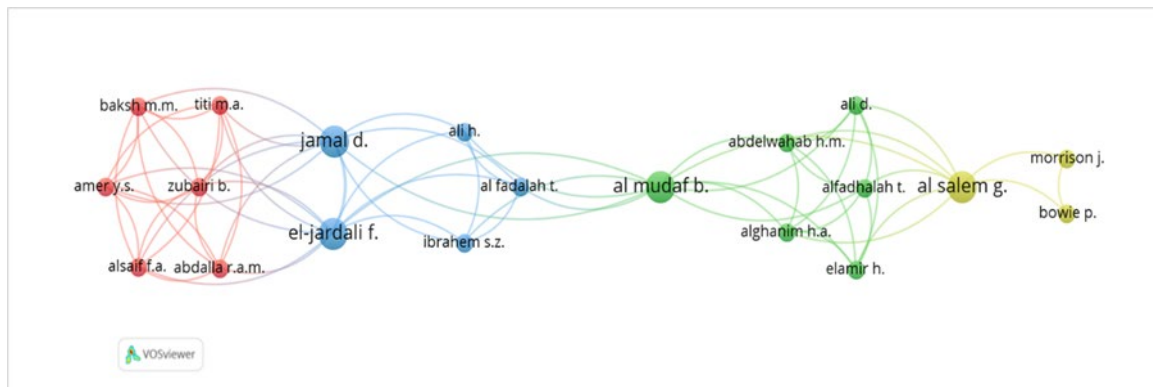
No.	Author(s)	Title	Year	Journal	Number of Citations
1	Sexton J.B., Adair K.C., Leonard M.W., Frankel T.C., Proulx J., Watson S.R., Magnus B., Bogan B., Jamal M., Schwendimann R., Frankel A. S	Providing feedback following Leadership WalkRounds is associated with better patient safety culture, higher employee engagement and lower burnout	2018	BMJ Quality and Safety	113
2	Eiras M., Escoval A., Grillo I.M., Silva-Fortes C	The hospital survey on patient safety culture in Portuguese hospitals: Instrument validity and reliability	2014	International Journal of Health Care Quality Assurance	41
3	Ali H., Ibrahim S.Z., Al Mudaf B., Al Fadalah T., Jamal D., El-Jardali F	Baseline assessment of patient safety culture in public hospitals in Kuwait	2018	BMC Health Services Research	37
4	Ree E., Wiig S	Linking transformational leadership, patient safety culture and work engagement in home care services	2020	Nursing Open	33
5	Verbakel N.J., Langelan M., Verheij T.J.M., Wagner C., Zwart D.L.M	Effects of patient safety culture interventions on incident reporting in general practice: A cluster randomised trial a cluster randomised trial	2015	British Journal of General Practice	30

No.	Author(s)	Title	Year	Journal	Number of Citations
6	Burlison J.D., Quillivan R.R., Kath L.M., Zhou Y., Courtney S.C., Cheng C., Hoffman J.M.	A multilevel analysis of U.S. Hospital patient safety culture relationships with perceptions of voluntary event reporting	2020	Journal of Patient Safety	27
7	Parker D., Wensing M., Esmail A., Valderas J.M.	Measurement tools and process indicators of patient safety culture in primary care. A mixed methods study by the LINNEAUS collaboration on patient safety in primary care	2015	European Journal of General Practice	27
8	Kumbi M., Hussen A., Lette A., Nuriye S., Morka G.	Patient safety culture and associated factors among health care providers in bale zone hospitals, southeast ethiopia: An institutional based cross-sectional study	2020	Drug, Healthcare and Patient Safety	26
9	Wang M., Tao H.	How does patient safety culture in the surgical departments compare to the rest of the county hospitals in Xiaogan city of China?	2017	International Journal of Environmental Research and Public Health	25
10	Göras C., Unbeck M., Nilsson U., Ehrenberg A.	Interprofessional team assessments of the patient safety climate in Swedish operating rooms: A cross-sectional survey	2017	BMJ Open	22

Co-authorship Network

Co-authorship, the collaboration between two or more individuals to jointly write a document, serves as a significant expression of scientific collaboration. This reflects the connections among researchers for the articulation and exchange of knowledge. In the case of research on the evaluation of Patient Safety Culture, it was observed that collaborative work is indeed prevalent, indicating that networked research efforts take precedence over individual work (Figure 3).

Figure 3. Co-authorship network. Analysis conducted using VOS viewer software version 1.6.20.



Journal Productivity

The analysis of journal productivity revealed that the 62 articles were published across 28 different journals, with 70.9% of the studies concentrated in 10 journals. The most prominent journal, in terms of the number of articles published, was BMJ Open (n=8), which is ranked in Quartile 1 (Q1). Furthermore, the quality of the journals in which studies related to Patient Safety Culture evaluation were published is high, as most of these articles appeared in journals ranked in Quartiles 1 and 2 according to the 2023 Scimago Journal Rank (SJR). This indicator measures the prestige of journals based on the number of citations received and the importance of the citing journals (Table 3).

Additionally, the thematic categories of these journals focused primarily on medicine and nursing, with no significant presence of Latin American journals among the most productive in this field.

Table 3. Most productive journals on the topic in the Scimago Journal & Country Rank (2024)

No.	Journal	Number of Articles	Country	Quartile 2023	SJR 2023	Category
1	BMJ Open	8	United Kingdom	Q1	0,971	Medicine
2	BMC Health Services Research	6	United Kingdom	Q1	1,029	Medicine; Health Services
3	International Journal for Quality in Health Care	6	United Kingdom	Q2	0.8	Health Services; Medicine; Public Health; Occupational and Environmental
4	BMC Nursing	5	United Kingdom	Q1	0,894	Nursing
5	PLoS ONE	5	United States	Q1	0,839	Multidisciplinary
6	Journal of Patient Safety	4	United States	Q1; Q2	0,739	Medicine; Nursing

No.	Journal	Number of Articles	Country	Quartile 2023	SJR 2023	Category
7	BMJ Open Quality	3	United Kingdom	Q2	0,559	Medicine; Nursing
8	International Journal of Environmental Research and Public Health	3	Switzerland	Q2	0,808	Environmental Science; Medicine
9	Journal of the Egyptian Public Health Association	2	Switzerland	Q2; Q1	0,854	Medicine; Nursing
10	Nursing Open	2	United States	Q1	0,782	Nursing

Scientific Leadership

The analysis of institutional participation based on author affiliations showed that 163 institutions contributed to the creation of the 62 articles analyzed. The predominant participation came from institutions in the United States (n=11), China (n=11), and Spain (n=9). In Latin America, only Brazilian institutions were represented (n=3).

Regarding scientific leadership, Table 4 presents the top ten institutions based on publication frequency. Additionally, the table includes Latin American institutions that have conducted research in this field.

Table 4. Representative institutions in the studies from the Scopus database (2024)

No.	Institution	Country	Frequency
1	Institute for Hospital Organization	Austria	4
2	Universität Klagenfurt	Austria	4
3	Alexandria University	Egypt	3
4	Ministry of Health Kuwait	Kuwait	3
5	Tongji Medical College of Huazhong University of Science and Technology	China	2
6	Amsterdam UMC - Vrije Universiteit	Switzerland	2
7	Universiteit van Amsterdam	Switzerland	2
8	The University of Manchester	United Kingdom	2
9	Zhejiang University	China	2
10	Peking University Health Science Center	China	2
11	Faculdade de Ciências Médicas e da Saúde de Juiz de Fora	Brazil	1
12	School of Health Sciences	Brazil	1
13	Universidade de São Paulo	Brazil	1

DISCUSSION

The evaluation of Patient Safety Culture has become a significant research interest, with a steady increase in publications starting in 2020. In this regard, a scoping review published in 2023 found that a high percentage (76%) of recent studies analyze the

relationship between Patient Safety Culture and the occurrence of adverse events, demonstrating a significant link between the improvement of safety culture and the reduction of adverse events ⁽¹²⁾. Furthermore, the World Health Organization (WHO), in its Global Patient Safety Action Plan, emphasizes the importance of incorporating safety culture into healthcare services to ensure a safe environment for patients and to foster a climate where healthcare professionals can express concerns openly without fear of retaliation or blame ⁽¹³⁾.

The bibliometric analysis revealed that the evaluation of Patient Safety Culture focuses on two main pillars: organizational processes and continuous quality improvement. These processes are integral to both hospital institutions and primary healthcare services, with the common goal of preventing adverse events. Recent studies confirm this trend, showing how the implementation of continuous quality improvement and organizational culture is closely linked to reducing adverse events and strengthening Patient Safety ⁽¹⁴⁻¹⁵⁾. One study demonstrated that higher scores in Patient Safety Culture are associated with fewer adverse events, highlighting the importance of an organizational approach to Patient Safety ⁽¹²⁾. Another study emphasized that teamwork, empowerment, and organizational learning are closely related to continuous improvement and the success of Patient Safety strategies ⁽¹⁶⁾.

Additionally, a high proportion of studies analyzed focused on measuring Patient Safety Culture, with a clear preference for using the Hospital Survey on Patient Safety Culture (HSOPSC) as the primary tool. A study conducted in Brazil adopted and validated the HSOPSC tool, demonstrating its validity and reliability for assessing healthcare professionals' perceptions of Patient Safety Culture in both public and private hospitals ⁽¹⁷⁾. Similarly, research in Kuwait highlighted the tool's high applicability in that context ⁽¹⁸⁾, which was corroborated by a systematic review conducted in North and South America, Europe, and the Middle and Far East, concluding the HSOPSC instrument's robust psychometric properties for measuring Patient Safety Culture ⁽¹⁹⁾.

The analysis identified that networked collaborative work prevails over individual efforts in research on this topic, allowing for an interdisciplinary approach and scientific collaboration among researchers. A bibliometric study highlighted the importance of teamwork and organizational culture for strengthening Patient Safety ⁽²⁰⁾. Additionally, a systematic review on culture and Patient Safety showed the effectiveness of teamwork in enhancing Patient Safety Culture and improving health outcomes in emergency services ⁽²¹⁾. This suggests that scientific development should continue to be driven by teamwork with an interdisciplinary focus to ensure that proposed interventions have a positive impact on patient health.

The analysis also revealed that the United States, China, and Spain show greater interest in research on evaluating Patient Safety Culture. This aligns with a bibliometric analysis on organizational culture in the healthcare sector, which found that most studies on this topic originate from the United States ⁽²²⁾, confirming its leadership in this field. Furthermore, a systematic review conducted in 2021 highlights China's leadership in this research area. However, this review contradicts the findings regarding Brazil's interest, as none of the selected articles were conducted in that country ⁽²³⁾.

Finally, the limitations of this study include the fact that it was restricted to studies retrieved solely from the Scopus database, which limited the analysis to indexed publications available on that platform. Additionally, studies in languages other than Spanish and English, as well as closed-access articles, were not considered, reducing the number of works included in the bibliometric analysis.

CONCLUSION

The bibliometric analysis on the evaluation of Patient Safety Culture, conducted between 2014 and the first quarter of 2024, reveals a growing trend in scientific production, particularly from 2020 onwards. This increase coincides with the impact of the COVID-19 pandemic on global healthcare systems. It is noteworthy that the studies are predominantly quantitative, with the Hospital Survey on Patient Safety Culture (HSOPSC) being the most frequently used tool for obtaining reliable and comparable results.

However, despite this rise in publications, there is limited participation from Latin American countries in this research field. In contrast, the United States, China, and Spain lead scientific output. This highlights the need to promote further research on Patient Safety Culture in underrepresented regions like Latin America, where contextual differences could provide valuable insights for improving safety in healthcare settings.

The analysis also underscores that the evaluation of Patient Safety Culture is closely linked to organizational processes and continuous quality improvement in healthcare delivery. Furthermore, scientific collaboration, as reflected in the formation of co-authorship networks, plays a key role in advancing this field, allowing for an interdisciplinary approach that enriches both knowledge generation and its application in various healthcare contexts.

In conclusion, this study emphasizes the importance of continuing to evaluate Patient Safety Culture as a crucial tool for enhancing healthcare systems, creating safer work environments, and reducing the occurrence of adverse events.

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Conflict of Interest: The authors declare no conflicts of interest.

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