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Advancements in Patient Safety: A Bibliometric Insight into Health Policy Services

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Abstract This study aims to explore patient safety in greater detail using bibliometric analysis to examine the landscape of patient safety literature over the past ten years (2014-2023), with a special focus on the 50 most cited documents. The analysis evaluates publication dynamics, impact of citations, collaborative authorship, and keyword patterns to provide an overview of changing concerns and impact of research on patient safety. A comprehensive bibliometric analysis was conducted using data from the Web of Science database. The search query included the keywords "patient safety" (title) and "Health Policy Services" (Web of Science Categories) for the period 2014-2023, limited to articles. The 50 most cited articles were identified for further analysis. The analysis revealed an average of 150 citations per article, indicating substantial involvement and relevance in patient safety research. The highest publication year was 2018, followed by a decline, suggesting more targeted research is emerging to address challenges. The articles were highly collaborative, with an average of 5 authors per article. Longitudinal thematic emphasis was evident in the fluctuations of Keywords Plus, particularly "adverse events," reflecting the dynamic challenges in healthcare systems. The results of this study have strong implications for setting research priorities, informing policy decisions, and guiding practical applications to improve patient safety in healthcare settings. With renewed research focus on patient safety, it should be possible to build a more resilient system capable of effectively meeting patients' requirements worldwide. Future research should address evolving safety concerns and leverage technological advances to improve patient safety.

Keywords Bibliometric, Health Policy, Patient Safety

1. Introduction

Increasing recognition, even at the global level, that medical errors and adverse events can have an impact on patient outcomes, the cost of healthcare and public confidence in it has led to an increase in global movements for prioritization of patient safety initiatives [1][2]. All the more reason that this landmark report from 1999, "To Err is Human: Building a Safer Health System" by the Institute of Medicine became a real impetus for increased attention to medical safety issues, having estimated that 44,000 to 98,000 deaths in patients in the US could be prevented each year due to medical errors [3]. This alarming statistic underscored the urgent need for systemic changes and evidence-based interventions that can contribute to reducing patient harm further increasing the quality of health care delivery. The call for action to identify, understand, and mitigate complex factors that cause patient safety incidents is increasing. Health policy makers, organizations, and researchers around the world are responding to this call. This, in turn, has led to an explosion of research related to different dimensions of safety, including organizational culture, human factors,

technology, and patient participation [4]. Many research studies have been conducted on how different strategies, namely teamwork training, communication protocols, and medication reconciliation, among others, have reduced adverse event cases or improved outcomes for patients [5], [6], [7].

In addition, increasing attention has currently been paid to the role of healthcare professionals, with many of these discussions often focusing on the place of nurses, particularly with regard to the aspect of patient safety. Previous studies looked at whether there was a relationship between staffing, workload, and work environment with the prevalence of medical errors and patient safety events [8], [9]. Some of the important factors are as follows: "Safe culture, including open communication, learning from errors, and support from leadership, has been identified as key success factors to improve patient safety [10]. Although great strides have been made in understanding and dealing with barriers to patient safety, adverse events and preventable harm still continue to occur at a rate that is less acceptable [11]. The COVID-19 pandemic has further exposed the weaknesses of health systems and highlighted the importance of appropriate, adaptable, patient-centered approaches to safety [12].

Bibliometric analysis has become a valuable tool for examining the evolution and impact of research in various fields, including patient safety. By quantitatively analyzing publication patterns, citation networks, and keyword frequencies, bibliometric studies can provide information on key themes, influential authors, and research trends within a given domain [12], [13]. Such analysis can help identify gaps in the literature, inform future research directions, and support evidence-based decision making in health policy and practice. The objective of this study is to conduct a comprehensive bibliometric analysis of the 50 top articles most cited related to patient safety in the field of health policy services, indexed in the Web of Science database over the last 10 years (2014-2023). By examining the characteristics, content, and impact of these highly cited articles, our objective is to provide an overview of the current state of patient safety research, identify key challenges and innovations, and highlight future directions in this critical field. Ultimately, this analysis will contribute to the development of strategies to reduce harm, improve patient outcomes, and inform policy decisions in healthcare settings worldwide.

2. Method

This study used a comprehensive bibliometric analysis approach to investigate the research landscape on patient safety within the domain of health policy services over the past decade (2014-2023). Bibliometric analysis is a powerful tool for examining the evolution and impact of research in various fields, allowing the quantitative assessment of publication patterns, citation networks, and keyword frequencies [14], [15], [16]. By applying bibliometric techniques to a carefully curated dataset, this study aimed to provide an overview of key themes, influential authors, and research trends in patient safety, ultimately contributing to a better understanding of the challenges, innovations, and future directions in this critical field.

Data Source

The Web of Science (WOS) database was selected as the primary data source for this study due to its extensive coverage of high-quality peer-reviewed journals in multiple disciplines [17]. WOS has been widely used in bibliometric studies for its robust indexing, consistent metadata, and comprehensive citation information [18].

Search Strategy

To retrieve relevant articles, we performed a keyword search using the following query: "patient safety" (title) AND "Health Policy Services" (Web of Science Categories) AND (2023 OR 2022 OR 2021 OR 2020 OR 2019 OR 2018 OR 2017 OR 2016 OR 2015 OR 2014) (publication years) AND "article" (document types). This search strategy was designed to capture a wide range of patient safety research in the specific context of health policy services, ensuring the inclusion of relevant studies while maintaining a manageable scope. The initial search yielded a total of 586 documents published between 2014 and 2023.

The inclusion criteria for the study were: (1) articles published in English, (2) articles focusing on patient safety in the context of health policy services, and (3) articles published between 2014 and 2023. Exclusion criteria were: (1) non-English articles, (2) articles not directly related to patient safety or health policy services, and (3) document types other than research articles.

Data Analysis

The data retrieved were analyzed using various bibliometric indicators to assess research trends, impact, and performance in patient safety research. The analysis included publication output and growth trends, providing information on the general development and productivity of the field over the past decade. Citation analysis, which encompasses total citations, average citations per article, and h-index, was conducted to evaluate the impact and influence of the published research. To identify key players in patient safety research in the context of health policy services, the most productive authors, affiliations, and countries were determined based on their publication output. Keyword co-occurrence analysis was performed to reveal the main themes and topics addressed in the literature, as well as their interrelationships and evolution over time.

To ensure the quality and relevance of the data analyzed, only articles published in peer-reviewed journals were included in the study. Additionally, articles in the top 50 most cited were subjected to a qualitative content analysis to identify the main themes, methodologies, and findings. This combined approach of quantitative bibliometric analysis and qualitative content analysis allowed for a comprehensive understanding of the research landscape and key contributions in the field of patient safety within health policy services.

3. Result and Discussion

This paper analyzes a data set extracted from the literature on patient safety and, more specifically, analyzes articles considered by the WOS as appropriate to be indexed in the category Health Policy Services. This data set has a duration of one decade (2014-2023), which could be considered a very inclusive temporal window toward the manifestation and effect of research on patient safety within health policy and services. In this period, our analysis comprised 76 sources of data – including journals and books – and formed a total of 586 documents, after the selection of the identified ones based on their direct relevance to patient safety according to our very strict inclusion criteria. The first review of the data set reflects that the high annual growth rate is -19.17%. As such, the volume of published documents within the "Health Policy Services" category generally reflects a decrease over the last decade in relation to patient safety. This trend may be explained by some changes in research priorities or publication practices in the field, which would require follow-up research to derive meaning from health policy and patient safety gains.

Our data set would reveal an average of 150 citations per article, which is quite amply indicating the far-reaching impacts and scope of research on patient safety in view of services of health policy. This high citation rate testifies not only to the essential value of the results, but also to the relevance of the research carried out for academia, health practitioners, and other classes of experts. This level of citation can also be an example of very active discourse among researchers, in turn, underscoring the dynamic maturation of patient safety as a critical area of study. The average number of authors contributed to each analysis article, highlighting collaborative research trends in patient safety. In fact, research is conducted largely in collaboration across institutions, countries, and disciplines, all looking at how complexity and multiplicity in the field can be faced. The fact that 622 authors from 32 countries are involved is testimony to interdisciplinary efforts in the conceptualization, design, and execution of research that can effectively contribute to improving patient safety.

During the decade, there was a steady increase in the publication distribution, with the highest at 80 in 2018 and slightly lower thereafter until 2023. Therefore, this trajectory would suggest that there was an early burst of interest and research output in the area of patient safety – undoubtedly responsive to emerging challenges, policy changes, or changes caused by improvements in healthcare technologies. It is also synchronized so that the peak period of this phase takes place at the most crucial effort in finding solutions to these problems, so that the produced literature makes a substantive contribution toward understanding and managing patient safety. See figure 1 for diagram distribution frequency.

Figure 1 shows the distribution of the time trend of patient safety publications from 2014 to 2023 in the category "Health Policy Services." Therefore, from the figure, it is vivid that the trend is increasing until the year 2018, whereby it peaked to stand out as the year with the highest publications totaling 80 articles. The orange peak is back a decade on the timeline of patient safety research. The fact that it runs into 2018 could be more recognition of the patient safety issue and perhaps more focused research on dealing with those trials. The very peak year then reflects the intensive effort of both academic and health concerns in the further development of their knowledge, practices, and policies with regard to patient safety. This is then followed by a minor drop in the number of publications as in table 1, which may reflect either a change towards more focused research or a kind of consolidation where the field is in the process of digesting the very substantial contributions made during the peak period. This pattern seems to suggest that patient safety research is dynamic, with peaks in terms of activity quickly followed by periods of decline and reassessment of research priorities.

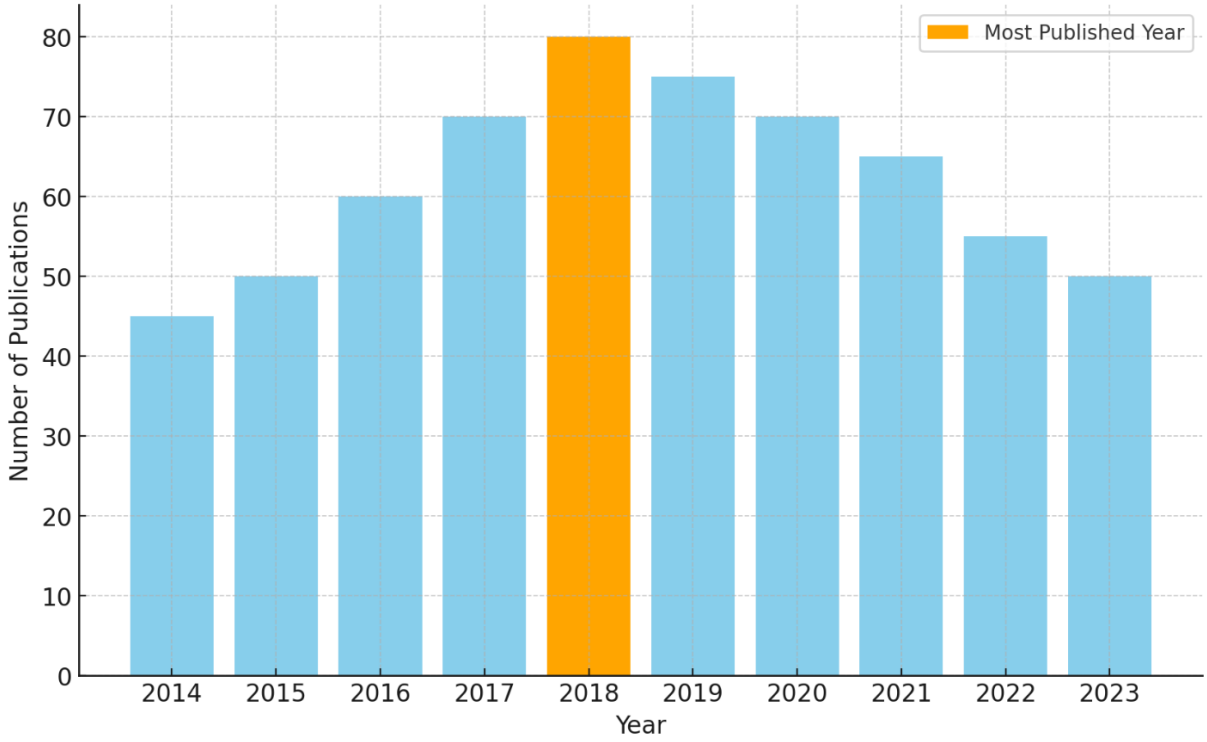

Figure 1. Distribution of Publications on Patient Safety (2014-2023)

Table 1. Most Productive Authors, Affiliations, and Countries

Authors	Articles	Affiliations	Articles	Countries	Articles
Fong A	8	Harvard University	31	USA	219
Lawton R	6	Johns Hopkins University	25	England	76
Ock M	6	University Of California System	17	Australia	52
Ratwani RM	6	US Department of Veterans Affairs	17	Canada	39
Thomas EJ	6	Harvard Medical School	16	Netherlands	27
Wagner C	6	Veterans Health Administration VHA	16	South Korea	26
Wright J	6	University Of London	15	Switzerland	24
Aiken LH	5	Brigham Women S Hospital	14	Spain	23
Choi EY	5	Johns Hopkins Medicine	14	Germany	20
Etchegaray JM	5	Stanford University	13	Peoples R China	20

The results of this bibliometric review will implicate the implications of the contemporary landscape in patient safety research, being relevant to the field of health policy services. Baselines were established from which the areas of expertise and key contributors can be determined in the present case against various identified critical sources, authors, affiliations, and countries. Today, the leading media include The Journal of Patient Safety, BMJ Quality & Safety, and the International Journal of Quality in Health Care. This is an indication that most of the high-impact research work on patient safety is published in these journals and plays a very important role in the dissemination of information in this discipline. Profiles like Fong A, Lawton R, and Oac M place great importance on leadership and expertise in substantial patient safety research.

The same holds for leading affiliations such as Harvard University, Johns Hopkins University, and the University of California System, which have shown commitment to research in patient safety in their high output and collaborations. The dominance of research experts from the United States, the United Kingdom, and Australia in patient safety research was evidence that this trio reflects their well-established healthcare systems, research infrastructure, and funding support. The result has been growing concern in these countries for patient safety as a

central issue in health care delivery and investment in research that will improve the outcome for patients and reduce the associated harm from receiving health care.

Top-50 Cited Articles

Patient safety seems to have taken its place as one of the most important and notable areas of focus for researchers over the past decade, within the field of health policy services. This study is a detailed bibliometric analysis of the 50 most cited articles on patient safety published from 2014 up to 2022. The average number of citations per document in the retrieved articles, which range from journals to books and miscellaneous sources, is 63.12 based on a total of 12 references. Therefore, this 26.7% annualized growth rate can lead to one conclusion. Thematic development is starting to move in other directions, or the main themes are reaching their saturation points. The average age of all documents is 7.74 years, which means that the most essential of them were written or released in the middle of the 2010s.

Table 2 shows the 50 articles most cited in patient safety research in the health policy services domain, published between 2014 and 2022, providing valuable information on key topics, challenges, and advances in this critical field. These studies highlight the multifaceted nature of patient safety, addressing issues ranging from organizational culture and leadership to human factors, communication, and patient participation. Several articles emphasize the importance of a strong patient safety culture within healthcare organizations. Studies by [19], [30], and [32] underscore the importance of leadership involvement, a safe environment, and adequate staffing to foster a culture that prioritizes patient safety. These findings suggest that organizations must invest in creating an environment that encourages open communication, learning from mistakes, and continuous improvement see table 2 and figure 2.

Table 2. List of the Top-50 Cited Articles

Author (Year)	Title	Journal	TC	Av/ year
Braithwaite J, 2015 [19]	Resilient health care: turning patient safety on its head	International Journal for Quality in Health Care	273	27.30
Mitchell I, 2016 [20]	Patient safety incident reporting: a qualitative study of thoughts and perceptions of experts 15 years after 'To Err is Human'	BMJ Quality and Safety	197	21.89
Griffiths P, 2014 [9]	Nurses' Shift Length and Overtime Working in 12 European Countries: The Association with Perceived Quality of Care and Patient Safety	Medical Care	186	16.91
Bates DW, 2018 [11]	Two Decades Since to Err Is Human: An Assessment of Progress and Emerging Priorities in Patient Safety	Health Affairs	160	22.86
Leotsakos A, 2014 [21]	Standardization in patient safety: the WHO High 5s project	International Journal for Quality in Health Care	107	9.73
Kellogg KM, 2017 [22]	Our current approach to root cause analysis: is it contributing to our failure to improve patient safety?	BMJ Quality and Safety	104	13
Mcfadden KL, 2015 [23]	Leadership, safety climate, and continuous quality improvement: Impact on process quality and patient safety	Health Care Management Review	90	9
Sexton JB, 2018 [10]	Providing feedback following Leadership WalkRounds is associated with better patient safety culture, higher employee engagement and lower burnout	BMJ Quality and Safety	87	12.43
Sloane DM, 2018 [24]	Effect of Changes in Hospital Nursing Resources on Improvements in Patient Safety and Quality of Care a Panel Study	Medical Care	85	12.14
Martinez W, 2017 [25]	Speaking up about traditional and professionalism-related patient safety threats: a national survey of interns and residents	BMJ Quality and Safety	79	9.88
Howell AM, 2017 [26]	International recommendations for national patient safety incident reporting systems: an expert Delphi consensus-building process	BMJ Quality and Safety	76	9.50
Lawton R, 2017 [27]	Can patient involvement improve patient safety? A cluster randomised control trial of the Patient Reporting and Action for a Safe Environment (PRASE) intervention	BMJ Quality and Safety	72	9
O'Hara R, 2015 [28	A qualitative study of systemic influences on paramedic decision making: care transitions and patient safety	Journal of Health Services Research & Policy	72	7.20

Table 2 continued

Alingh CW, 2019 [29]	Speaking up about patient safety concerns: the influence of safety management approaches and climate on nurses' willingness to speak up	BMJ Quality and Safety	65	10.83
Sexton JB, 2014 [30]	Exposure to Leadership WalkRounds in neonatal intensive care units is associated with a better patient safety culture and less caregiver burnout	BMJ Quality and Safety	65	5.91
Baines R, 2015 [31]	How effective are patient safety initiatives? A retrospective patient record review study of changes to patient safety over time	BMJ Quality and Safety	60	6
Alenius LS, 2014 [32]	Staffing and resource adequacy strongly related to RNs' assessment of patient safety: a national study of RNs working in acute-care hospitals in Sweden	BMJ Quality and Safety	59	5.36
Van Gerven E, 2016 [33]	Increased Risk of Burnout for Physicians and Nurses Involved in a Patient Safety Incident	Medical Care	58	6.44
Giardina TD, 2018 [34]	Learning From Patients' Experiences Related To Diagnostic Errors Is Essential For Progress In Patient Safety	Health Affairs	56	8
Danielsson M, 2019 [35]	A National Study of Patient Safety Culture in Hospitals in Sweden	Journal of Patient Safety	52	8.67
Martinez W, 2015 [36]	'Speaking up' about patient safety concerns and unprofessional behaviour among residents: validation of two scales	BMJ Quality and Safety	51	5.10
Keebler JR, 2014 [37]	Validation of a teamwork perceptions measure to increase patient safety	BMJ Quality and Safety	50	4.55
Joesten L, 2015 [38]	Assessing the Perceived Level of Institutional Support for the Second Victim After a Patient Safety Event	Journal of Patient Safety	49	4.90
Lyren A, 2016 [39]	Ohio Children's Hospitals' Solutions for Patient Safety: A Framework for Pediatric Patient Safety Improvement	Journal for Healthcare Quality	45	5
Schnipper JL, 2018 [40]	Effects of a multifaceted medication reconciliation quality improvement intervention on patient safety: final results of the MARQUIS study	BMJ Quality and Safety	44	6.29
Aiken LH, 2018 [8]	Nurses' And Patients' Appraisals Show Patient Safety in Hospitals Remains a Concern	Health Affairs	44	6.29
Liu CJ, 2014 [41]	Patient safety culture in China: a case study in an outpatient setting in Beijing	BMJ Quality and Safety	43	3.91
Southern DA, 2017[42]	Deriving ICD-10 Codes for Patient Safety Indicators for Large-scale Surveillance Using Administrative Hospital Data	Medical Care	42	5.25
Rhodes P, 2016 [43]	Trust, temporality and systems: how do patients understand patient safety in primary care? A qualitative study	Health Expectations	42	4.67
Tregunno D, 2014 [44]	Integrating patient safety into health professionals' curricula: a qualitative study of medical, nursing and pharmacy faculty perspectives	BMJ Quality and Safety	41	3.73
Mannion R, 2014 [45]	Systematic biases in group decision-making: implications for patient safety	International Journal for Quality in Health Care	40	3.64
Al-Mugheed K, 2022 [46]	Patient Safety Attitudes among Doctors and Nurses: Associations with Workload, Adverse Events, Experience	Healthcare (Switzerland)	39	13
Sollid SJM, 2019 [47]	Five Topics Health Care Simulation Can Address to Improve Patient Safety: Results from a Consensus Process	Journal of Patient Safety	38	6.33
Bishop AC, 2017 [48]	Patient Involvement in Patient Safety: A Qualitative Study of Nursing Staff and Patient Perceptions	Journal of Patient Safety	38	4.75

Table 2 continued

Verbeek-Van Noord I, 2014 [49]	Is culture associated with patient safety in the emergency department? A study of staff perspectives	International Journal for Quality in Health Care	38	3.45
Jarrar M, 2019 [50]	Hospital nurse shift length, patient-centered care, and the perceived quality and patient safety	International Journal of Health Planning and Management	37	6.17
Hickner J, 2016 [51]	Differing perceptions of safety culture across job roles in the ambulatory setting: analysis of the AHRQ Medical Office Survey on Patient Safety Culture	BMJ Quality and Safety	36	4
Perneger TV, 2014 [52]	Internal consistency, factor structure and construct validity of the French version of the Hospital Survey on Patient Safety Culture	BMJ Quality and Safety	36	3.27
Austin JM, 2014 [53]	Safety in Numbers: The Development of Leapfrog's Composite Patient Safety Score for U.S. Hospitals	Journal of Patient Safety	36	3.27
Meddings J, 2017 [54]	Evaluation of the association between Hospital Survey on Patient Safety Culture (HSOPS) measures and catheter-associated infections: results of two national collaboratives	BMJ Quality and Safety	35	4.38
Hwang Ji, 2015 [55]	What are hospital nurses' strengths and weaknesses in patient safety competence? Findings from three Korean hospitals	International Journal for Quality in Health Care	35	3.50
Burgener AM, 2020 [56]	Enhancing Communication to Improve Patient Safety and to Increase Patient Satisfaction	Health Care Manager	33	6.60
Hibbert PD, 2016 [57]	Patient safety's missing link: using clinical expertise to recognize, respond to and reduce risks at a population level	International Journal for Quality in Health Care	33	3.67
Richter JP, 2016 [58]	The influence of organizational factors on patient safety: Examining successful handoffs in health care	Health Care Management Review	33	3.67
Doyle P, 2015 [59]	Self-reported patient safety competence among Canadian medical students and postgraduate trainees: a cross-sectional survey	BMJ Quality and Safety	33	3.30
Zaheer S, 2015 [60]	Patient safety climate (PSC) perceptions of frontline staff in acute care hospitals: Examining the role of ease of reporting, unit norms of openness, and participative leadership	Health Care Management Review	33	3.30
Bal G, 2014 [61]	Improving Quality of Care and Patient Safety Through Morbidity and Mortality Conferences	Journal for Healthcare Quality	33	3
Carayon P, 2018 [62]	Challenges And Opportunities for Improving Patient Safety Through Human Factors and Systems Engineering	Health Affairs	32	4.57
Armitage G, 2018 [63]	Patient-reported safety incidents as a new source of patient safety data: an exploratory comparative study in an acute hospital in England	Journal of Health Services Research and Policy	32	4.57
Farnan JM, 2016 [64]	Patient safety room of horrors: a novel method to assess medical students and entering residents' ability to identify hazards of hospitalization	BMJ Quality and Safety	32	3.56

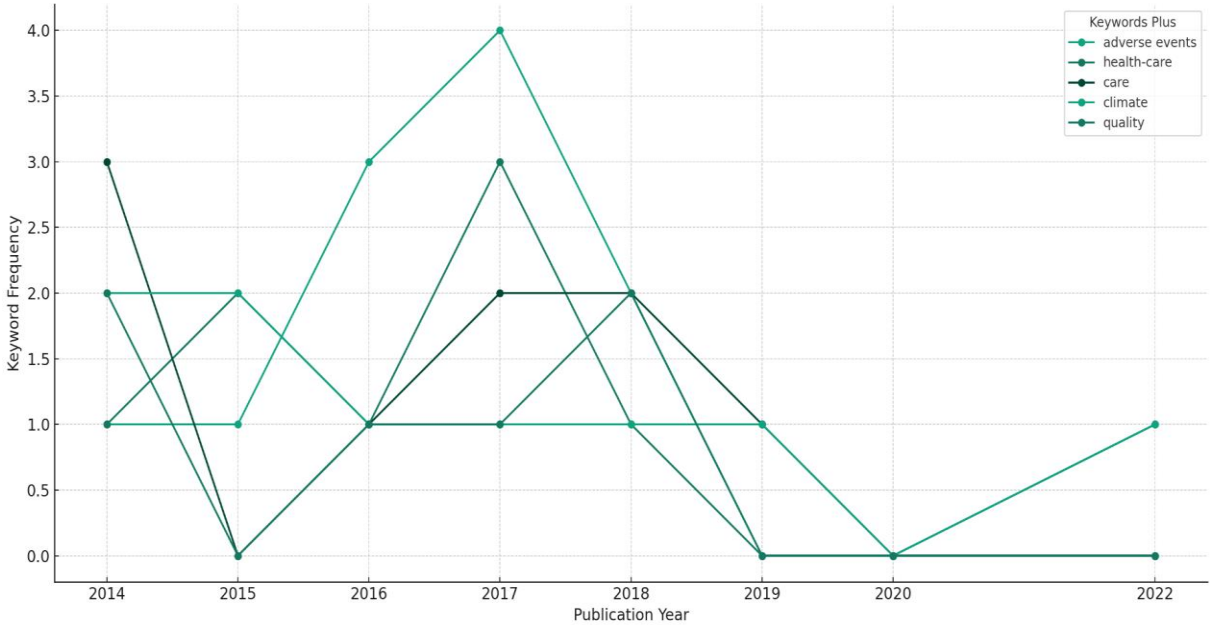

Figure 2. Yearly Trend of Top Keyword Plus in Patient Safety Research

The role of healthcare professionals in patient safety is another recurring theme. Articles by [9], [33], and [56] explore the impact of nursing work conditions, such as shift length and workload, on patient safety outcomes. Additionally, studies by [36], [25], and [59] emphasize the importance of empowering healthcare professionals to speak out about safety concerns and the need for effective training in patient safety competencies. The impact of human factors and systems engineering on patient safety is another key area of research. Articles in [62] and [47] emphasize the need for a holistic approach that considers the complex interactions between people, technology, and processes in healthcare settings. These studies underscore the importance of designing systems that minimize the potential for human error and support efficient and safe care delivery.

Several articles focus on specific patient safety initiatives and interventions. Studies by [21], [39], and [40] evaluate the effectiveness of standardization efforts, collaborative improvement frameworks, and medication reconciliation interventions in improving patient safety. These findings highlight the value of evidence-based practices and the need for a rigorous evaluation of safety interventions. The articles mentioned above also address the challenges and opportunities associated with measuring and monitoring patient safety. Studies by [20], [26], and [42] explore the limitations of current incident reporting systems and propose strategies to improve the collection and analysis of safety data. These findings emphasize the need for robust measurement tools and the integration of multiple data sources to gain a comprehensive understanding of patient safety performance.

In the area of bibliometric research, "Keywords Plus" becomes a very instrumental tool as it provides a very wide area for the keyword search that is wider than that provided by authors. Some keywords in this article will be generated automatically by the indexing services of the Web of Science from some of the titles of some of the cited articles. The Keywords Plus literally helps to bring out the hidden links within the research landscape, links that really form a key towards an improved understanding of trends in subject matter and the development of interdisciplinary linkages. The most used Keywords Plus are then used in the annual trend analysis, which closely follows the changing landscape in patient safety research. In fact, the fluctuating frequencies of these keywords outline changes in focus over the years, which probably expose dynamic challenges of the health care system, new technical interventions, and the updated policy frameworks that have been catching attention for their implementation toward improvement and assurance of the patient's safety.

This represents a critical difference when comparing the longitudinal analysis of the relative prominence given to different themes, such as "adverse events," "quality of healthcare care," and "nurse," among others, in the area of patient safety. Such trends in the development of the theme may be viewed as the reaction of the community of researchers to the reality of health care within the real world with all of its systemic defects and the nursing staff in keeping those systems working for the benefit of patients' safety and quality of care.

4. Limitations and Implications

This study has produced notable findings in the context of the scope of patient safety research in the area of health policy services arena; however, one must also take into account the limitations of the study. Information was obtained from only one source database, the Web of

Science, and there is a prospect that there will be other papers of relevance in the provided context. Future studies may enhance the coverage of the database and use other databases like Scopus or PubMed to further widen the coverage of the literature. The research was limited to a specific time frame (2014–2023) and a specific subject category (Health Policy Services) on the Web of Science, which would have been a limitation to the inclusion of similar articles that would have been published anywhere else outside of the specified time scale or were somehow not classified under the same head. A broader subject category and time range may in fact provide a broader view of the development of research in the domain of patient safety.

The review also had to take place on the basis of bibliometric indicators, with much to be learned from which, but only a partial view can be obtained of the qualitative nuances of the studies. While the content analysis of the 50 articles most cited provided some representation of the key topics and conclusions, a more substantive qualitative review should offer a much better view of the nuances and complexities of the field of patient safety research. Despite these restrictions, the results of this study have important implications for policy in the area of patient safety. The key themes produced, the influential authors, and the identified research streams have the ability to direct policy development and allocation of resources. For example, the focus on adverse events and the contribution of healthcare professionals to achieving patient safety highlight the need to have policies that allow the development of a strong safety culture, support the reporting of incidents, and facilitate the provision of education and resources to healthcare personnel.

More so, the findings show that collaborative working and multidisciplinary research are totally paramount in the research of patient safety, not just because of the high mean co-authorship numbers for such papers but also because of the spread of researchers involved in making contributions to them. This is a very strong suggestion of the need for collaborative thinking about how to promote collaborative work and share learning between organizations, disciplines, and nations to actually address the formidable obstacles to patient safety. Finally, the bibliometric analysis will provide the basis for future research directions in patient safety. Having detected gaps in the literature and emerging trends, policymakers and researchers can focus on the areas that should be studied more, and resource allocations can also be made accordingly. This study might be the impetus for more focused and powerful research to improve patient safety outcomes and better healthcare quality.

Noting the limitations of this bibliometric analysis, these findings have pertinent policy implications insofar as they relate to the issue of patient safety. The knowledge and insight that this study has generated can be of value in policy development, resource allocation, and the direction of further research activity, so that it finally becomes the source of a more healthy and safe health program that places the welfare of the patient at its core. Subsequent research, especially, while elaborating on these findings and overcoming the weaknesses that have been identified, will be of the utmost importance in the advancement of the field of patient safety and in bringing about substantive improvements in healthcare policy and practice.

5. Conclusions

Such an enormous body of literature does well to collect 586 documents culled from leading journals indexed by the Web of Science, in capturing the vibrancy and the difficulties well. On average, each article receives 150 citations, highlighting the impact and relevance of patient safety research. Therefore, this shows the highest level of relevancy this body of work has in influencing policies and practices toward protecting the patient by both the academic and healthcare sectors being actively involved in them. In fact, the average number of authors of the articles is 5, which shows the collaborative and interdisciplinary nature of the research, which has proven to be a necessity in addressing these complex issues in patient safety. This collaboration provides an added value research environment that unifies a group of scholars and practitioners with a sense of belonging to further develop patient safety standards. Therefore, the trajectory of publications to their peak in 2018 would probably signal an earlier upsurge in the field of patient safety research reflecting emerging challenges and new technological possibilities within healthcare.

A closer and longitudinal examination of the Keywords Plus in their history of use in patient safety research reveals an interesting pattern of sine wave fluctuation of the thematic emphasis over the last decade or more, particularly with respect to "adverse events". It is a term central to the discourse on patient safety and refers to unintended injuries or complications resulting from the processes of care, rather than from the patient's underlying disease condition. The relative importance attached to 'adverse events' in scholarly articles tracks the changing priorities of and challenges to health care systems and adaptive responses of the research community to these dynamics. Our study reaffirms the importance of patient safety as a critical area of research within health policy services. The insights from this decade-long analysis will not only provide insight into the accomplishments and challenges of this field but also set the way for research, policy, and practice to advance. Keeping a focus on patient safety contributes to a health system that is safer, more resilient, and harmonized to serve and take care of patients around the world.

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