Mapping the growth and trends of knowledge management in health organizations: A bibliometric exploration

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ABSTRACT

This study performs a detailed bibliometric analysis of 168 research papers on knowledge management (KM) in healthcare from the Scopus database, spanning from 1996 to 2023. Utilizing tools like RStudio with the Biblioshiny package, VOSviewer, and KnowledgeMatrix Plus, the analysis reveals a notable increase in publications over the last ten years. The United Kingdom emerges as the top publisher, followed by the United States and Malaysia. Major themes identified include knowledge, KM, and KM systems, especially focusing on significant papers concerning KM systems in healthcare. This thorough analysis offers important insights into the current trends in KM research within healthcare settings, emphasizing key topics, influential works, leading publishing countries, and collaboration patterns. It's suggested that the analysis could improve by directly comparing these findings with existing research and discussing the strengths and limitations in comparison to other studies. Nevertheless, the results offer practical advice for writers, researchers, and practitioners for identifying gaps in research and creating effective KM strategies in healthcare. This paper adds to the existing knowledge base in the field and lays the groundwork for future research and practical implementation of KM strategies in healthcare.

1. Introduction

The healthcare industry is continuously changing (Naik et al., 2022). Healthcare institutions encounter numerous challenges in providing excellent patient care while also being operationally efficient. To address these challenges, healthcare organizations can implement knowledge management (KM) strategies. These strategies help them acquire, create, store, share, and use knowledge to improve their performance and achieve better results for patients (Alajmi et al., 2016; El Morr and Subercaze, 2010; Ayatulloh et al., 2021). KM is creating, sharing, using, and managing knowledge and information within an organization to achieve its objectives. (Charles, 1999) KM has become an essential factor in improving the quality of health services in healthcare organizations.

KM has emerged as a crucial aspect in healthcare organizations due to the rapidly growing volume of information and knowledge in the healthcare industry. Several studies have been conducted on KM in health organizations to identify its significance, challenges, and opportunities. For instance, Abidi (2001), Bose (2003), El Morr and Subercaze (2010), and Sharma et al. (2005) have contributed to the discourse. Over the past two decades, KM in health organizations has been the subject of extensive research.

Bibliometric analysis has become a valuable tool for understanding the research landscape in a particular field by analyzing the publication patterns, impact, and collaboration among researchers. In this study, we conducted a bibliometric analysis of 168 studies published between 1996 and 2023 from the Scopus database to provide a comprehensive overview of research on KM in health organizations To search for the following questions:

- RQ1: What are the most frequent keywords in KM in health organizations according to the Scopus database?
- RQ2: What are the most referenced authors on the topic of KM in health organizations according to the Scopus database?
- RQ3: What are the most referenced sources and documents on the topic of KM in health organizations according to the Scopus database?

- RQ4: What are the most referenced organizations and countries on the topic of KM in health organizations, according to the Scopus database?
- RQ5: What are the most important recent research trends in the field of KM in health organizations?

Therefore, this bibliometric study aims to analyze the existing literature on KM in health organizations to provide a comprehensive overview of the current state of research in this field. The novelty of this work lies in its comprehensive bibliometric exploration of the field of KM (KM) in health organizations, covering a substantial dataset spanning from 1996 to 2023. The study offers a unique and up-to-date perspective on the growth and trends in this area by employing various bibliometric tools. Moreover, the study's investigation of collaborative patterns among researchers and identifying recent research trends offers valuable information for scholars and practitioners in the healthcare industry. This research fills a critical knowledge gap by providing a contemporary analysis of the KM literature in health organizations, enabling researchers to stay abreast of the latest developments and aiding in formulating strategies to advance KM in healthcare

In contrast, Abidi's (2001) seminal work centered on elevating the 'knowledge quotient' within healthcare enterprises through KM, introducing the concept of a Healthcare Enterprise Memory to extract and operationalize a diverse range of healthcare knowledge for strategic decision-support services. In our research, we perform an extensive bibliometric analysis encompassing 168 research articles on KM in health organizations, uncovering a notable surge in research publications, especially in the past decade. This analysis identifies pivotal research themes, influential publications, and productive countries, providing valuable perspectives on the present landscape of KM research in the healthcare sector.

The study's results revealed the growth trend, productivity, impact, and collaboration pattern of research on KM in health organizations. The study identified the most productive countries, influential papers, and research themes related to KM in health organizations. The study's findings can be used to guide future research and develop effective strategies for promoting KM in health organizations.

2. Literature review

KM is creating, sharing, using, and managing knowledge and information within an organization to improve performance and achieve organizational goals. KM involves identifying valuable knowledge, capturing and organizing it, and making it available to those who need it when they need it (Alavi and Leidner, 2001).

KM has become increasingly important in the healthcare sector, where knowledge sharing and collaboration among healthcare professionals are critical for delivering quality care. This literature review aims to provide an overview of the current state of KM in health organizations (Carasso et al., 2005; de Souza et al., 2021; Van Beveren, 2003).

According to Alavi and Leidner (2001), KM refers to creating, sharing, using, and managing knowledge and information in an organization. Davenport and Prusak (1998) described KM as the process of capturing, distributing, and effectively using knowledge.

Several studies have explored the application of KM in health organizations. For example, Edmondson et al. (2001) studied the implementation of new technology in hospitals and found that effective knowledge sharing and learning among team members were critical for successful implementation.

KM can also lead to improved patient outcomes. For instance, a study by Middleton et al. (2013) found that KM strategies, such as clinical decision support systems and electronic health records, can improve the quality of care and reduce medical errors.

In addition, KM can enhance collaboration and communication among healthcare professionals, leading to more effective teamwork and better patient outcomes. A study by Huysman and De Wit (2013) found that KM practices, such as communities of practice and knowledge-sharing platforms, can facilitate collaboration and information exchange among healthcare professionals.

However, there are also challenges to implementing KM in health organizations, including resistance to change, lack of incentives for knowledge sharing, and difficulties in measuring the impact of KM on organizational performance (Alavi and Leidner, 2001).

Consequently, due to the significant volume of scientific studies addressing complex aspects of KM in healthcare organizations, research in this field has branched out in various directions. Nevertheless, research on KM in healthcare organizations can be categorized into three main areas: knowledge, KM, and KM systems.

2.1. Knowledge in health organizations

These research studies shed light on the critical importance of knowledge and the need for investments in learning within healthcare organizations. Healthcare institutions are knowledge-based entities that heavily rely on medical professionals' expertise and specialized knowledge to advance their activities and provide high-quality care. The quality of healthcare services is intricately linked to a well-informed and knowledgeable system that prioritizes specialized knowledge in various medical disciplines (Jorge et al., 2021).

Most of these research studies primarily focus on knowledge sharing within healthcare organizations. This emphasis on knowledge sharing stems from the understanding that sharing and spreading

knowledge among healthcare professionals is vital for improving patient outcomes and enhancing overall healthcare practices. By promoting the exchange of knowledge, healthcare organizations can harness the collective expertise of their staff, stay up-to-date with the latest advancements, and continuously improve the quality of care provided to patients (Ali et al., 2012; Han and Pashouwers, 2018; Waring et al., 2014).

2.2. KM in health organizations

Studies in this field extensively explore the intricacies of KM processes within healthcare organizations. The initial focus of these studies lies in creating and generating knowledge within healthcare organizations. This involves the identification of sources, methods, and practices through which new knowledge is developed, whether through clinical research, academic collaboration, or experiential learning. Furthermore, researchers delve into the organization and storage of knowledge, addressing how healthcare organizations structure and categorize the amassed knowledge. This includes establishing effective KM systems, information repositories, and databases that facilitate easy access, retrieval, and maintenance of knowledge assets. Additionally, the distribution and utilization of knowledge form significant areas of investigation. Studies explore how knowledge is disseminated among healthcare professionals, whether through training programs, knowledge-sharing platforms, or interdisciplinary collaborations. The goal is to ensure that valuable knowledge reaches the right individuals, enabling informed decision-making and enhancing overall patient care (Abidi, 2001; Carasso et al., 2005; El Morr and Subercaze, 2010; de Souza et al., 2021; Sharma et al., 2005). By comprehensively examining these KM processes within healthcare organizations, researchers aim to identify best practices, barriers, and opportunities for improvement. Ultimately, this research contributes to advancing KM strategies that can optimize healthcare delivery, enhance patient outcomes, and foster continuous improvement within the healthcare sector (Ayatollahi and Zeraatkar, 2020; Ghosh and Scott, 2005).

2.3. KM systems in health organizations

Additional studies focus on the implementation of KM systems within healthcare organizations. These research endeavors explore the strategies, methods, and practices involved in establishing and operationalizing effective KM systems tailored to the healthcare context. By examining these aspects, researchers aim to provide insights and guidance on how healthcare organizations can successfully implement KM systems to optimize knowledge sharing, collaboration, and decision-making processes (Alavi and Leidner, 2001; Ali et al., 2017; Karamitri et al., 2017; Shahmoradi et al., 2017). Numerous studies delve into various aspects of KM

beyond those mentioned, encompassing areas such as communities of practice, knowledge fairs, information systems, and organizational learning. This breadth of research highlights the intricate nature of the topic, demonstrating its complexity and the diverse range of factors that contribute to effective KM. The wide array of subjects explored within the KM field underscores this discipline's multifaceted nature (Bate and Robert, 2002; Jones, 2016; Littlejohns et al., 2003; Winschiers-Theophilus et al., 2022). KM plays a critical role in the performance of health organizations. Facilitating the creation, sharing, and use of knowledge can improve decision-making, enhance collaboration, increase efficiency, and ultimately improve patient outcomes. However, health organizations must overcome the challenges of implementing KM strategies to realize these benefits.

3. Method

According to Donthu et al. (2021), the key steps for conducting bibliometric analysis involve establishing the specific objectives and boundaries and defining the precise goals of the study to pick appropriate analysis methodologies and data collection techniques. Thereafter, methodologies that fit within the framework of the study should be chosen, and the particular kind of bibliometric data needed should be considered. Following, collect relevant Data while ensuring that searched words give accurate results and avoid errors such as duplications. Finally, the analysis will be conducted and reported in a brief and clear manner that aligns with the targeted publication outlet.

A comprehensive bibliometric approach was used in this study. This approach commonly incorporates examining different characteristics of scholarly publications, including citation patterns, co-citation analysis, and mapping of research networks using Biblioshiny, VOSviewer, and KnowledgeMatrix Plus, to gain a comprehensive understanding of the KM literature in healthcare.

3.1. Data collection

The study used the Scopus database to collect data on studies on KM in health organizations published between 1996 and 2023. The search terms used were "knowledge management" and "health organizations." The search was limited to articles published in English and peer-reviewed journals. The search yielded a total of 168 studies This data is distributed according to the years as follows.

According to Fig. 1, there has been a significant increase in the attention given to KM in health organizations, particularly within the last decade. The number of publications related to this topic exceeded 18 in 2019 and 2022. This demonstrates that KM remains a significant and relevant research subject and continues to guide scholars and academics across various fields, especially in healthcare.

Fig. 1: Publications per year (KnowledgeMatrix outputs)

3.2. Data analysis

Drawing upon the techniques and strategies of bibliometric analysis, the study utilized five primary approaches: Co-occurrence, citations, co-citations, co-authorship, and bibliographic coupling-to construct the required statistics and networks that uncover the most prominent authors, references, research institutions, and countries in the domain of KM in health organizations (Zupic and Čater, 2015).

The study used three tools for data analysis: RStudio from Biblioshiny, VOSviewer, and KnowledgeMatrix Plus RStudio from Biblioshiny was used to perform a bibliometric analysis of the articles, including the number of articles published per year, the most cited articles, and the most active authors and institutions VOSviewer was used to create a co-citation network of the articles. The

network visualized the relationships between the articles based on their co-citation patterns. The analysis identified the most influential articles and authors in the field KnowledgeMatrix Plus was used to conduct a content analysis of the articles. The tool analyzed the abstracts of the articles and identified the most common themes and topics discussed in the literature

4. Results

4.1. Keywords

The most visible words in KM research in health organizations published in the Scopus database are depicted in Figs. 2-6.

Fig. 2: Word cloud (R outputs)

The words "Knowledge management," "human," "healthcare," and "female" are among those that appear to be most frequently used in this context, indicating their significance in the field of KM. This word cloud offers a helpful visual representation of the key concepts and themes in KM in health organizations. Additional network terms like "health

knowledge," "health personnel," and "knowledge-based systems" imply that KM entails a comprehensive strategy for exploiting and disseminating knowledge for the organizational development of health organizations. Fig. 3 appears to repeat these words in more detail.
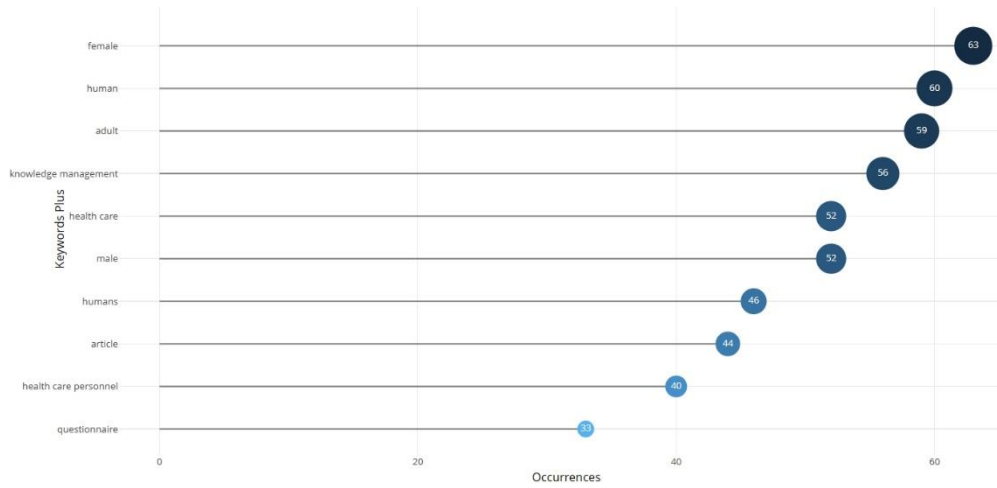
Fig. 3: Most relevant words (R outputs)

Following the analysis of the word cloud in Fig. 2, Fig. 3 lists the KM terms that are most pertinent. Notably, many of the most pertinent words concern people's characteristics (male, female, adult, and human). Especially given that the character of people is essentially tied to KM in the health system. Other significant terms in the list are "knowledge management" and "healthcare personal," which denote that comprehensive human resources are necessary for effective KM. All this indicates the presence of clusters (or sub-fields) to research in this field, as shown in Fig. 4.
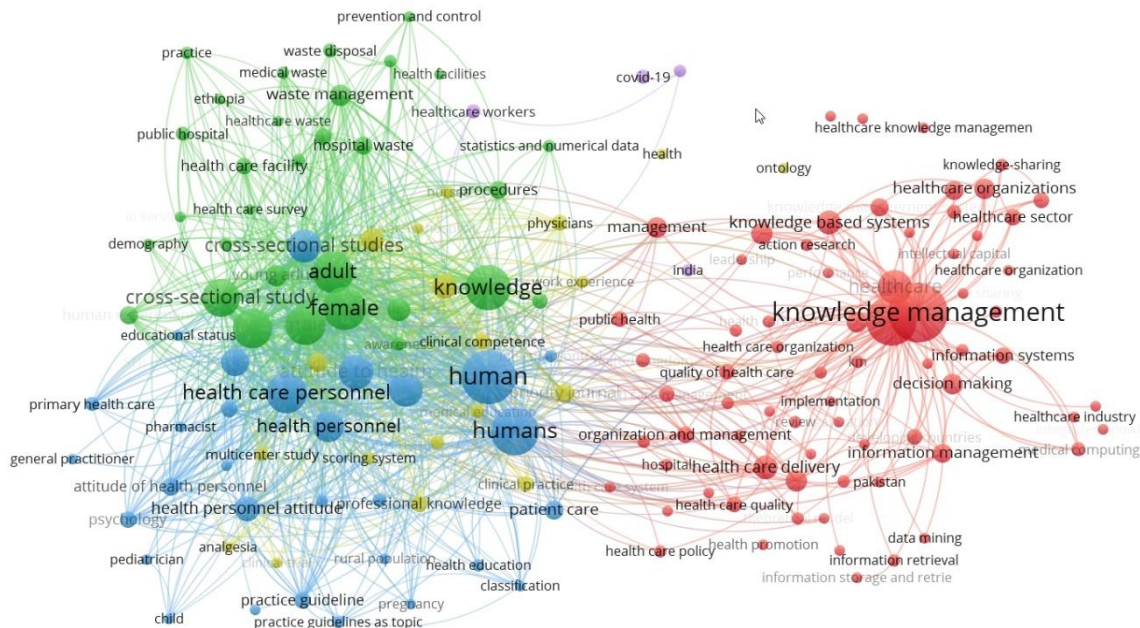

Fig. 4: Co-occurrence network (VOSviewer outputs)

Fig. 4 depicts a network of co-occurrences of words linked to KM in health organizations. Some clusters or subgroups of nodes appear to be tied to specific concepts or topics. There could be a cluster of nodes associated with "healthcare personnel" or the green cluster (human and people, female, male, adult, etc.), where this cluster is related to the nature of individuals in health organizations. The second cluster is associated with the "knowledge management system" or the red cluster, which includes (KM, knowledge-based systems, decision-making, information technology, healthcare, healthcare organizations, etc.); this cluster is associated with the installation of the KM system in health organizations. The third cluster, or the Blue cluster, is concerned with "service quality" (healthcare quality, patient care, delivery of healthcare, hospitals, healthcare delivery, etc.). The fourth cluster (Yellow cluster) is related to "clinical competence," which includes (clinical competence, clinical practice, work experience, training, etc.). These four clusters show that research on KM in health organizations is initially related to examining the nature of personnel who support the use of the KM system to allow for the improvement of health service quality.

A conceptual map of KM is shown in Fig. 5. It might be a framework or visual model that illustrates the connections between various concepts and ideas in the area of KM in health organizations. We can see from this graphic that the many thoughts and ideas are systematically connected.
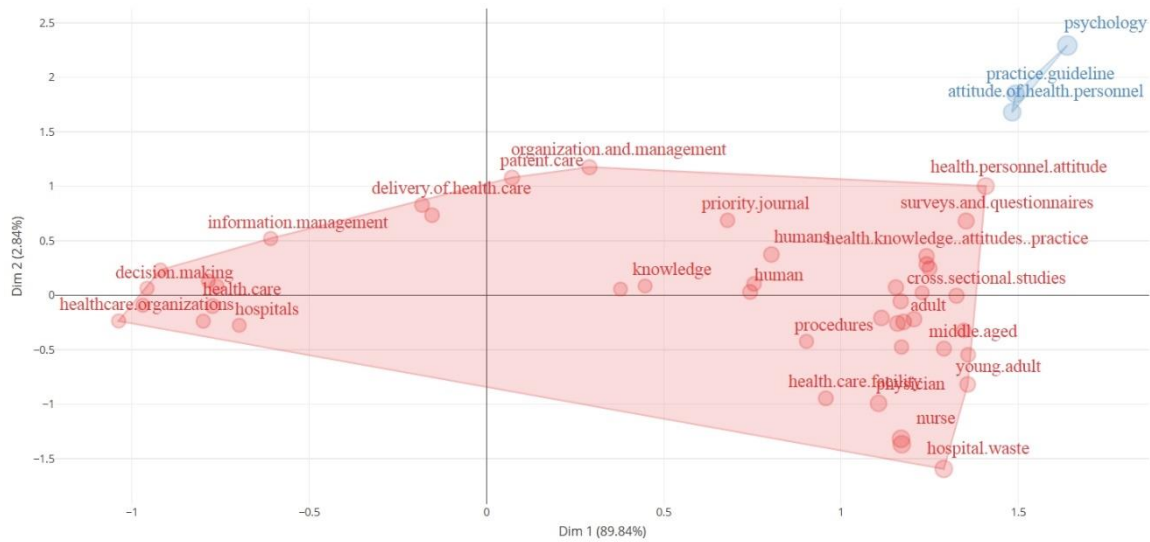
Fig. 5: Conceptual structure map–Method: MCA (R outputs)

The relationship between psychology and KM in health organizations is represented at the top by the attitude of health personnel, psychology, and practice guidelines. Adults, attitudes, clinical practice, controlled studies, cross-sectional studies, decision-making, healthcare, health knowledge, Health personnel, healthcare organizations, hospital waste, humans, information management, information systems, Information technology, knowledge, knowledge-based systems, KM, etc. may be more specific concepts at the bottom that represent the application of KM systems in health organizations. This conceptual structure might be useful for scholars, practitioners, and organizations looking to understand better KM and the ideas and principles underpinning it in health organizations. It also reveals the presence of research trends, as shown in the Fig. 6.
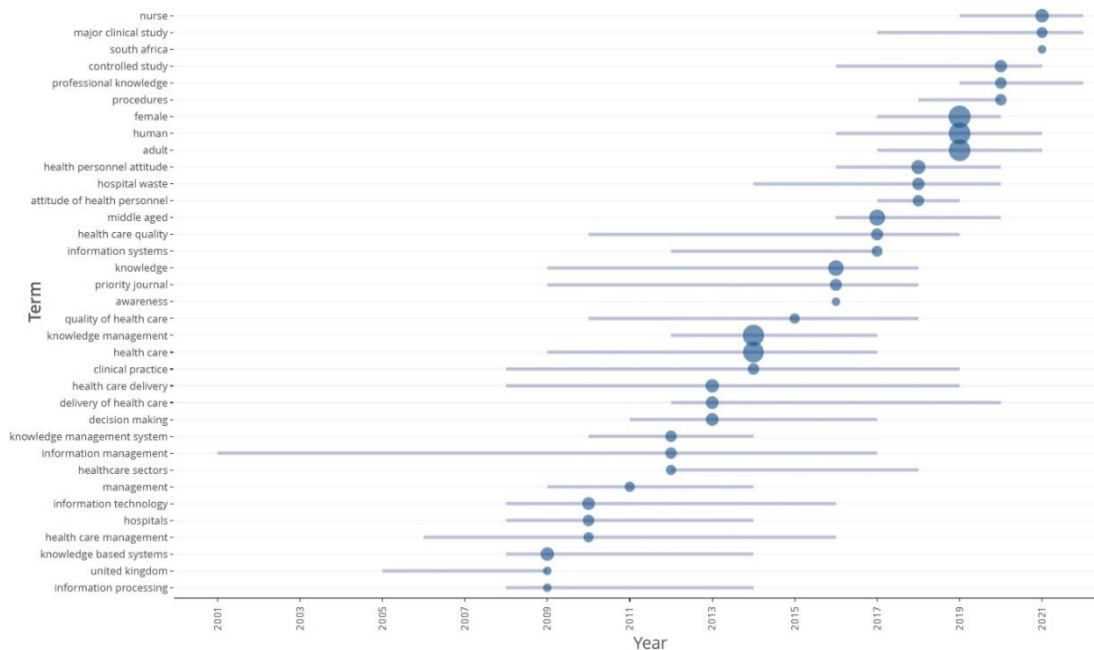

Fig. 6: Trend topics (R outputs)

Fig. 6 presents a valuable picture of the trend issues in KM in health organizations across time, assisting in identifying the main concepts and themes that are now most important and popular in the area. We can see from this graph that the trend of subjects has changed over time. In the early years, for example, the emphasis could have been on "analgesia," "South Africa," "nurse," "controlled research," "procedures," "female," "human," and "adult." The graph may also show specific issues that have gained popularity or traction over time. For example, trend subjects could include "female," "human," "adult," "knowledge management," and "healthcare." This data might benefit scholars, practitioners, and organizations looking to keep up with this topic's newest advancements and trends.

4.2. Authors

Figs. 7-14 show the most influential authors in the field of KM in health organizations.
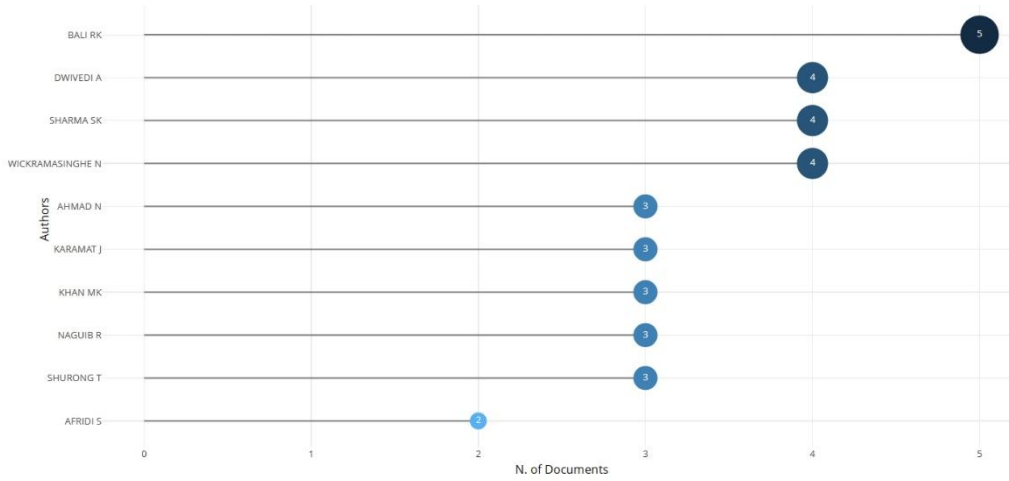
Fig. 7: Authors' local impact (R outputs)

Fig. 7 depicts a list of the most influential authors in the field of KM in healthcare organizations. It may be used to identify researchers or practitioners who have made significant contributions to this field, such as Bali RK (5 publications), Dwivedi A, Sharma SK, Wickramasinghe N (4 publications), Ahmad N, Karamat J, Khan MK, Naguib R, and Shurong T (3 publications), and so on. In terms of citations, the order of these researchers' changes, as shown in the Fig. 8.
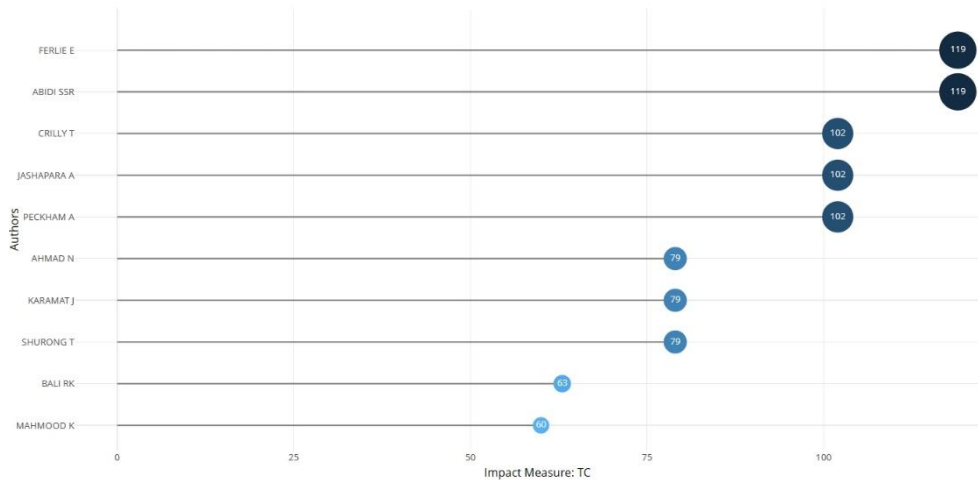

Fig. 8: Most locally cited authors (R outputs)

Fig. 8 shows that many researchers have many citations compared to their colleagues with larger publications. These citations reached x citations for each of Ferlie E., Abidi SSR., Crilly T., Jashapara A., Peckham A., Ahmad N., Karamat J., Shurong T., Bali RK., Mahmood K, etc. These researchers have many citations, and they are most referenced in Scopus. As for the citation network of these researchers, it appears in the Fig. 9.
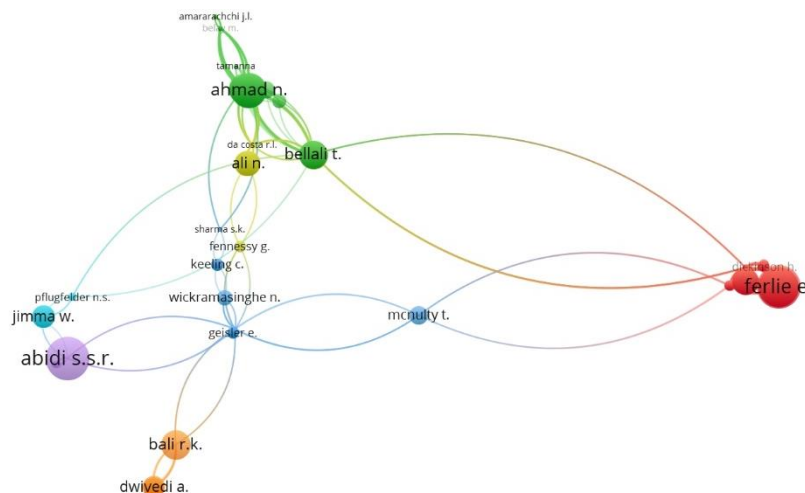

Fig. 9: Authors network (VOSviewer outputs)

In the analysis, Fig. 9 illustrates that most highly cited authors are not referenced in the same publications within the database. Instead, they are mentioned in other publications. This indicates several things, including the emergence of new researchers with citation relationships in the same database, as well as the multidimensionality of the topic of KM in health organizations. This topic involves various disciplines of knowledge and the presence of specialized researchers with a fixed research path in this area and researchers who do not have a specific focus on this subject, as demonstrated in Fig. 10. Fig. 10 demonstrates that there are four authors who have more remarkable persistence and specialization in the realm of KM in health organizations than their peers. These authors are Sharma SK (14 years), Vickramasinghe N (9 years), Bali RK (6 years), and Dwivedi A (6 years). They were included in the researchers' network depicted in Fig. 9 and should be the reference points

for any researcher working in this area. Additionally, Fig. 10 displays Author Productivity through Lotka's Law.

By analyzing the Author's Productivity through Lotka's Law (as shown in Fig. 11), we can notice that most of the publications in the field of KM in healthcare organizations are contributed by a few highly productive authors. In contrast, most authors have contributed much less to this field (Table 1). This concentration of publications among a small group of researchers in the field suggests that knowledge and expertise in this area are largely centered around this group of researchers.

4.3. Sources and documents

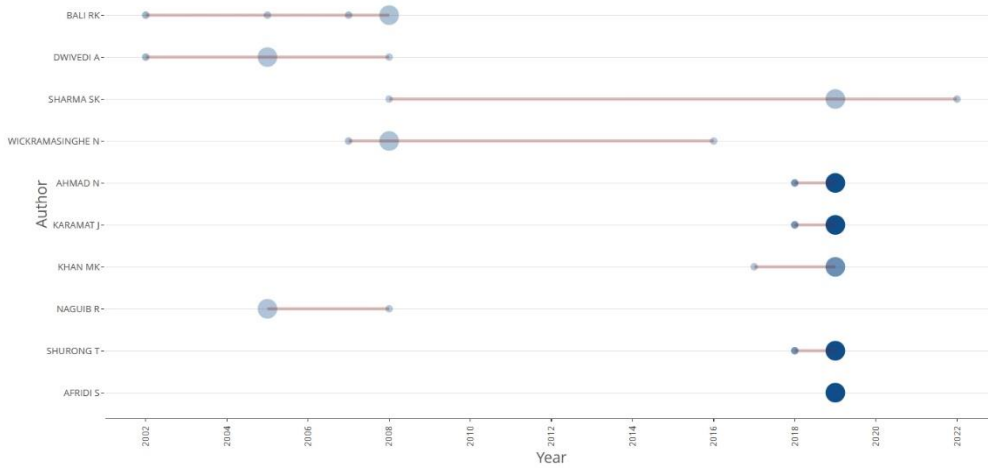This component highlights the key findings associated with examining sources and documents.

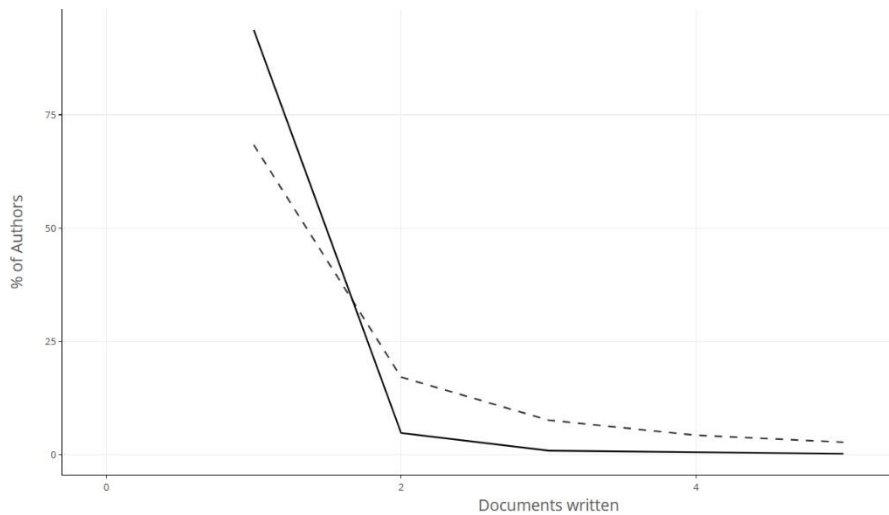**Fig. 10:** Authors' production over time (R outputs)

Fig. 11: Author productivity through Lotka's law (R outputs)

Table 1: Author productivity through Lotka's law (R outputs)

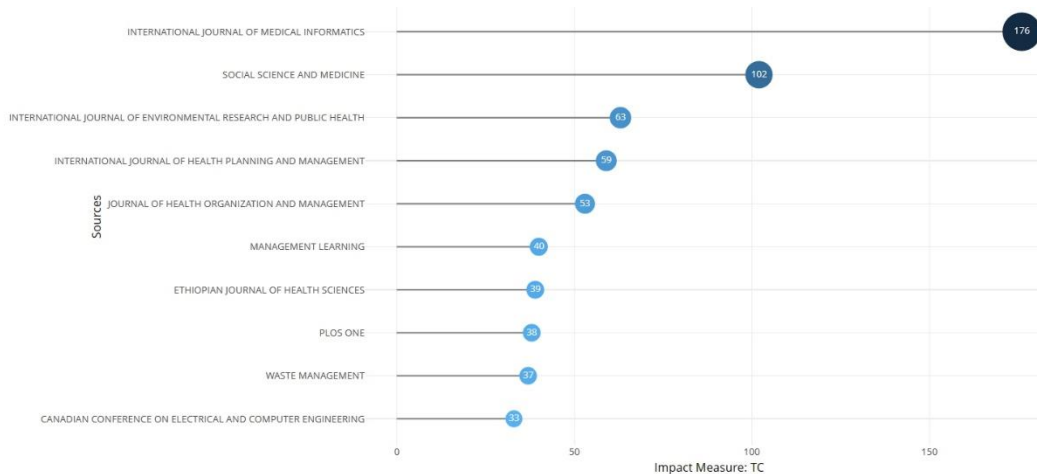| Documents written	No. of authors	Proportion of authors
1	554	0.941
2	26	0.044
3	5	0.008
4	3	0.005
5	1	0.002

Fig. 12: Most locally cited sources (R outputs)

Fig. 12 depicts the leading sources or publications cited in the domain of KM in healthcare organizations. These sources have been identified through Scopus and include the International Journal of Medical Informatics, Social Science and Medicine, International Journal of Environmental Research and Public Health, International Journal of Health Planning and Management, Journal of Health Organization and Management, Management Learning, Ethiopian Journal of Health Sciences, PLOS ONE, Waste Management, Canadian Conference on Electrical and Computer Engineering, among others. Fig. 13 presents various articles related to these sources.

Fig. 13, known as the Core Sources Figure based on Bradford's Law, displays the primary literature

sources about KM in healthcare organizations. Fig. 13 demonstrates that a limited number of sources, including Proceedings of Europe, comprise a significant portion of the literature in this area. In contrast, a more significant number of sources contribute to a smaller quantity. This pattern aligns with Bradford's Law, which suggests that a small core of sources or journals will account for most articles on a particular topic. In contrast, subsequent sources will have a decreasing level of contribution. Fig. 13 offers valuable insight for researchers and professionals interested in KM in healthcare organizations by indicating the most important sources of information.
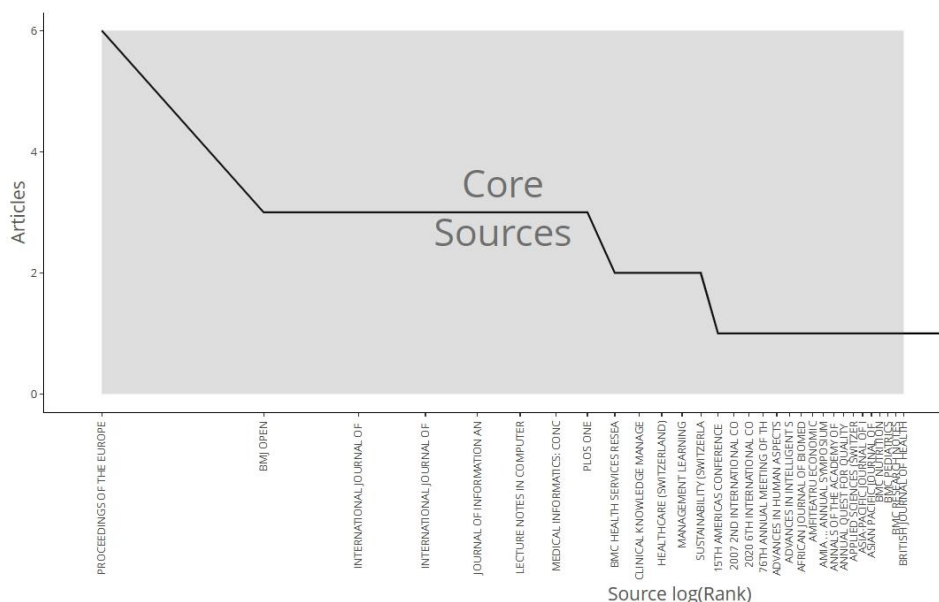

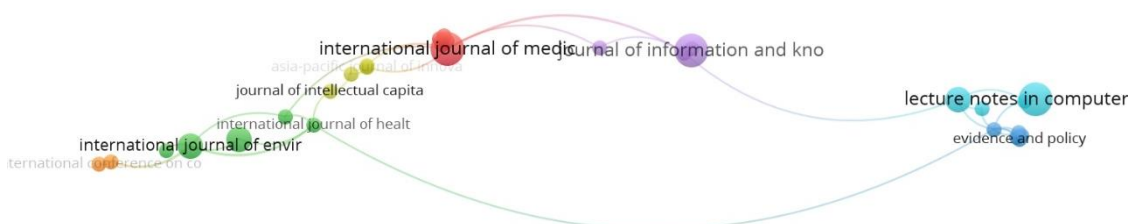**Fig. 13:** Core sources by Bradford's law (R outputs)

Fig. 14: Sources network (VOSviewer outputs)

According to Fig. 14, most highly cited journals are not included in the network since they are not connected to other journals within the same base used in the analysis but instead linked to different journals. Nonetheless, the field of KM in healthcare organizations is multidimensional, implying that there are various dimensions or aspects to it beyond the scope of the present analysis. Figs. 15-19 show the analysis of articles or references in more detail.
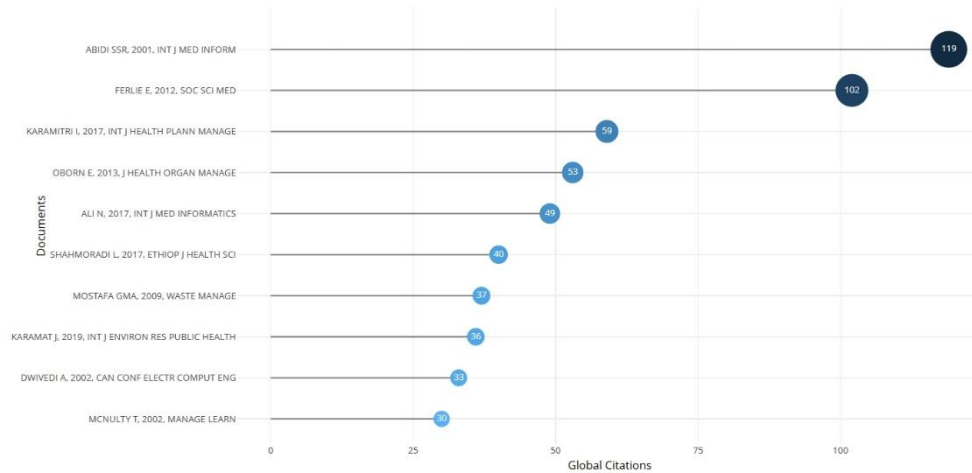

Fig. 15: Most globally cited documents (R outputs)

The Scopus database identifies the most referenced and cited articles in the domain of KM in healthcare organizations, as presented in Fig. 15 (Abidi, 2001; Ali et al., 2017; Dwivedi et al., 2002; Ferlie et al., 2012; Karamat et al., 2019; Karamitri et al., 2017; McNulty, 2002; Mostafa et al., 2009; Oborn et al., 2013; Shahmoradi et al., 2017). These articles must be considered and incorporated in previous research on this subject, requiring special attention from researchers. Furthermore, the network illustrating the links to these references will be presented in Fig. 16.
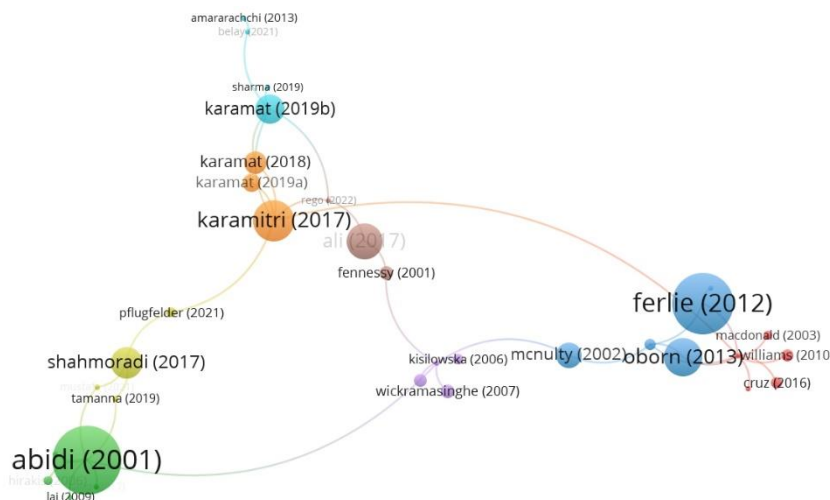

Fig. 16: Documents network (VOSviewer outputs)

The primary reference in KM in healthcare organizations is Abidi's (2001) work from 2001, as indicated by Fig. 16. Numerous other highly cited works have emerged from Abidi's work. Additionally, there are sub-networks identified in Fig. 16, including Abidi (2001), Ferlie et al. (2012), Oborn et al. (2013), Karamitri et al. (2017), Fennessy (2001), and Shahmoradi et al. (2017). Researchers in this field need to conduct thorough research on these references.

4.4. Organizations and countries

This element emphasizes the principal discoveries linked to analyzing organizations and countries. Fig. 17 shows that the most referenced research organizations in terms of the number of research and publications in the Scopus database in the field of KM in health organizations are, respectively Coventry University, Northwestern Polytechnical University, Staffordshire University, The University of Jordan, London School of Hygiene And Tropical Medicine, University of Gondar, University Of Kwazulu-Natal, University Of Nicosia, Haramaya University, Jilin University. As for citations and publications together, they appear in the following matrix.

To elaborate further, Fig. 18 displays the leading organizations in the field of KM in health organizations, which include the School of

Management, Department of Management, Department of Community Medicine, Business School, Faculty of Computing, Department of Nursing, Department of Pathology, Biocore, Coventry University, and Chengdu University of Traditional Chinese Medicine. These organizations have the

highest number of publications and citations in this field, indicating that they should leverage their expertise and continue to publish in this area. As for the network that links these research institutions, it appears in the Fig. 19.
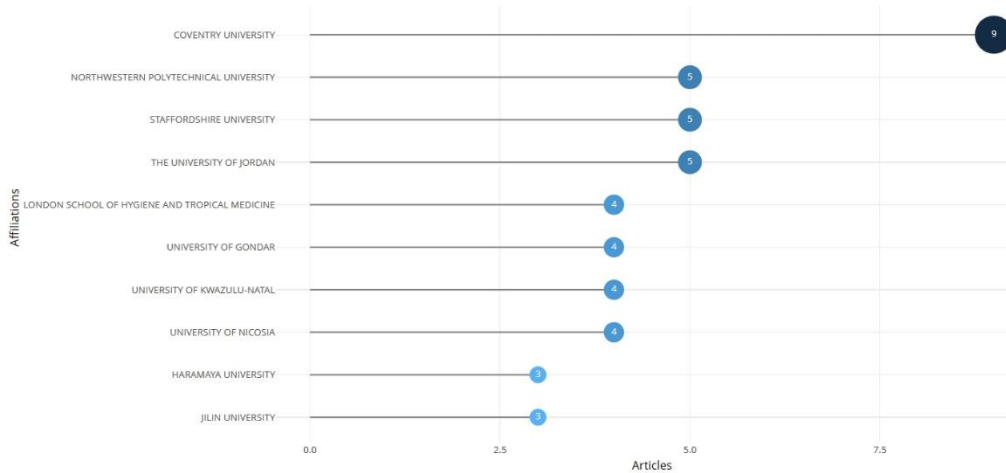

Fig. 17: Most relevant affiliations (R outputs)
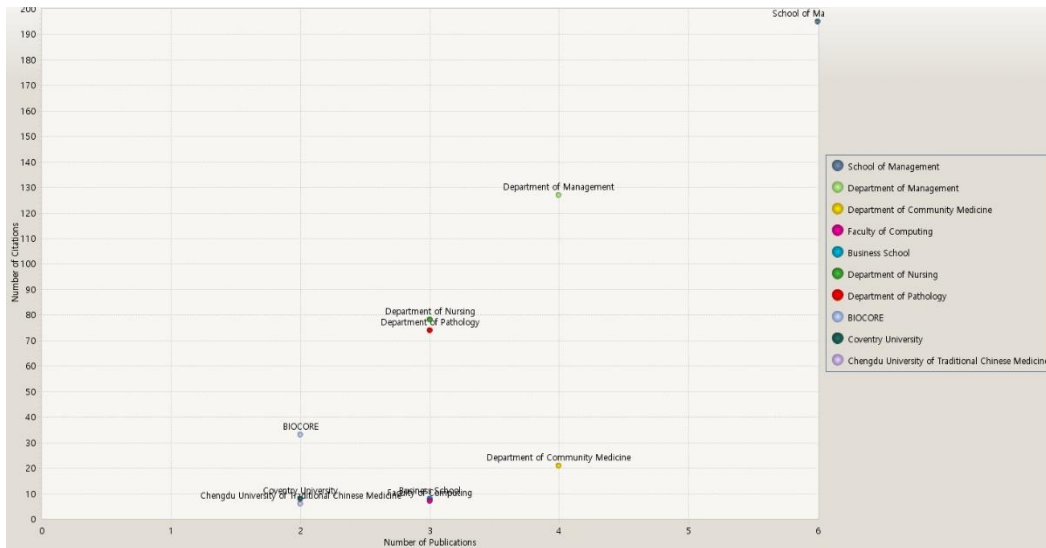
Fig. 18: Citations per publications by organizations (KnowledgeMatrix outputs)

Fig. 19: Organizations network (VOSviewer outputs)

Fig. 19 illustrates the range of research institutions associated with management and business that are most frequently cited. This indicates that the area of research, namely KM in

health organizations, is more closely linked to this particular field than other disciplines. The research institutions identified are in various countries, as depicted in Fig. 20-24.

Fig. 20: Most cited countries (R outputs)

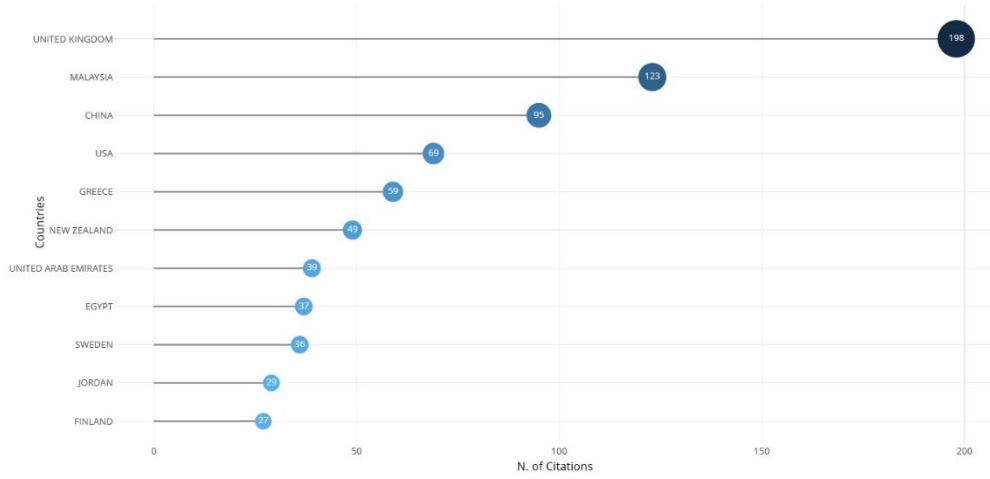According to the Scopus database, Fig. 20 indicates that the most frequently cited countries in the field of KM in health organizations are the United Kingdom, Malaysia, China, the United States, Greece, New Zealand, Egypt, the United Arab Emirates, Sweden, Finland, and others. The matrix outlining the ranking of countries in terms of publications and citations is provided in Fig. 21.
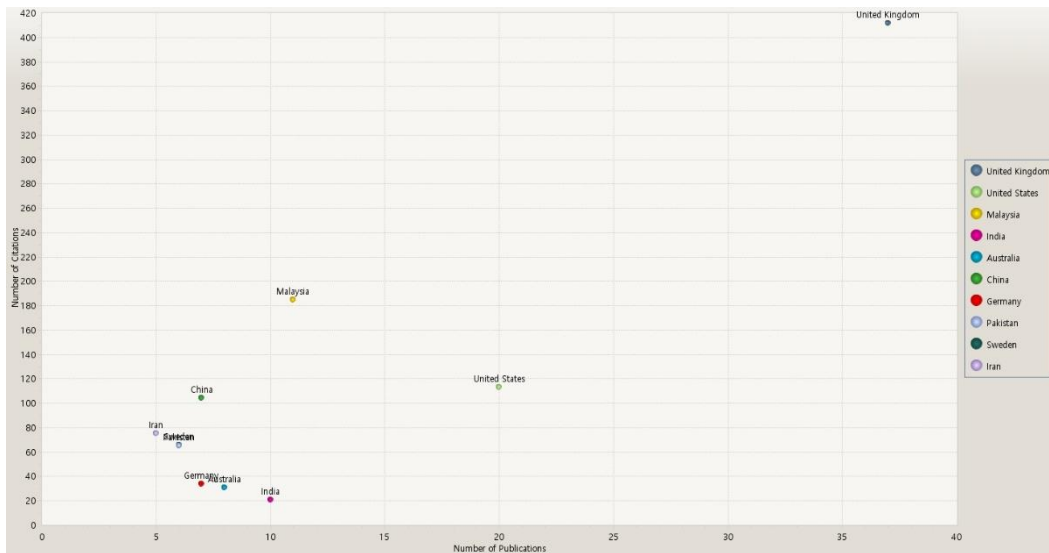
Fig. 21: Citations per publications by countries (KnowledgeMatrix outputs)

The ranking of countries in terms of publications and citations is presented in Fig. 21, where the United Kingdom takes the lead, followed by the United States, Malaysia, India, China, Australia, Germany, Pakistan, Sudan, and Iran, making up the top 10 reference countries in the field of KM in health organizations. Fig. 22 displays the research collaborations among these countries.

Fig. 22: Countries' collaboration world map (R outputs)

The diagram in Fig. 22 illustrates the collaborations in research among the top countries with the most publications and citations in KM in healthcare organizations. There are limited research partnerships, with the primary collaborations being between the United States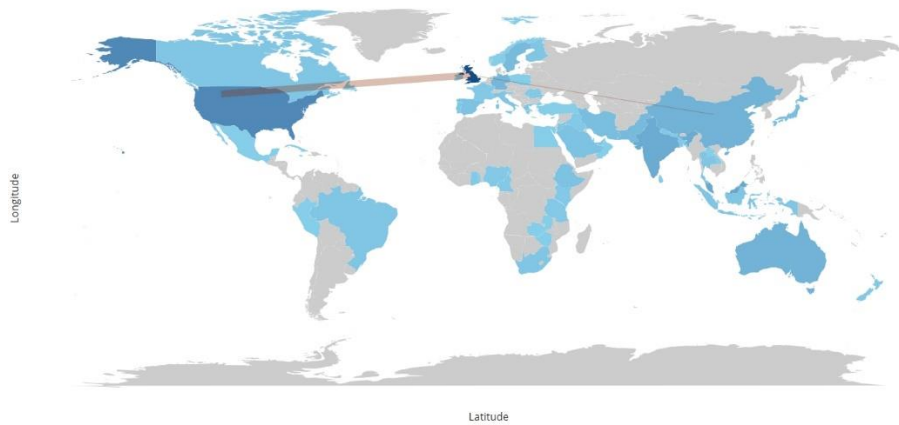 and Europe and between Europe and China. This diagram demonstrates the network of international relationships based on citations in this field. Fig. 23 illustrates numerous international connections between countries' research on KM in healthcare organizations, as evident from the top reference countries, which are the United Kingdom, the United States, India, and Australia, which form a research cluster. Other countries are also associated with this cluster in various ways, including Malaysia, Germany, China, Iran, Pakistan, and more. This suggests that researchers diligently share countries' experiences on this subject.

4.5. Compound results

Fig. 24 shows a composite bibliometric analysis that combines keywords, authors, and references. Fig. 24 is a powerful visual representation of the complex interplay between different elements within the domain of KM in health organizations. It reveals that researchers explore multiple scientific or research fields to contribute to the healthcare sector's overarching KM theme. Our analysis unveiled a chronological evolution of research interests and how they ultimately culminate in the central theme of KM in health organizations.
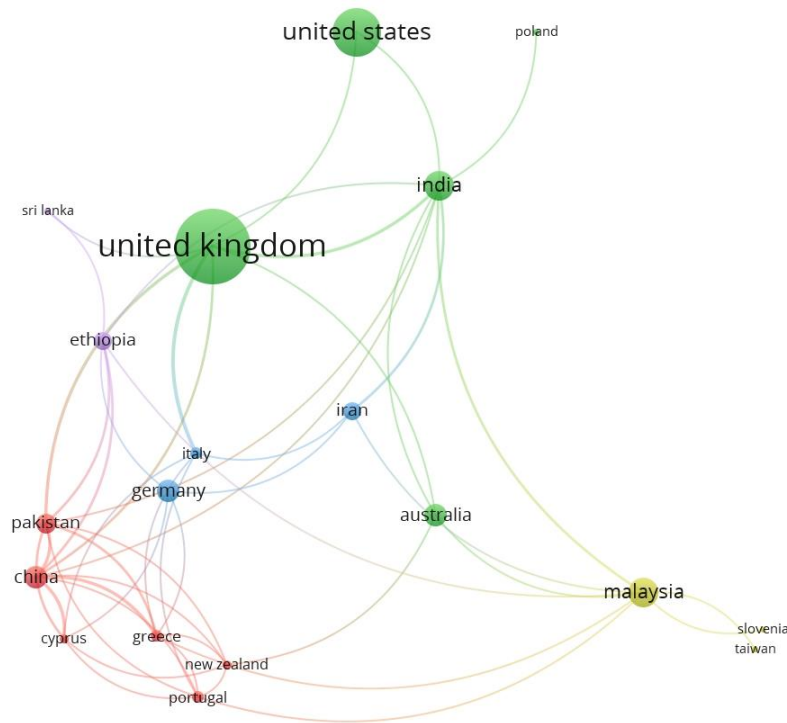
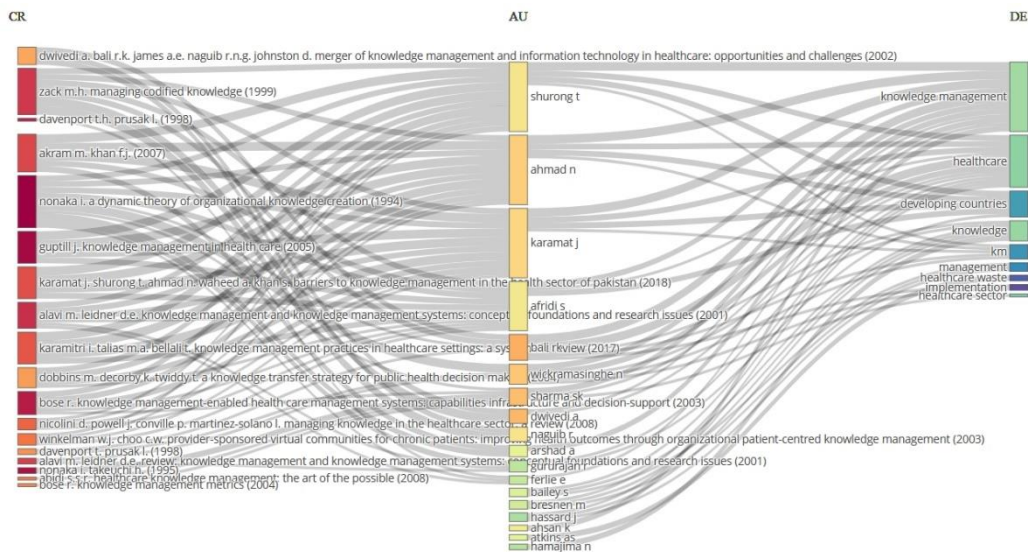

Fig. 23: Countries network (VOSviewer outputs)

Fig. 24: Three-field plot (R outputs)

The journey begins with the broad variable of "KM in healthcare." Initially, many authors examined this overarching topic, as exemplified by Karamat et al.'s (2019) study on the barriers to KM in the health sector of Pakistan. Subsequently, this broad theme underwent further exploration, leading to the emergence of several subtopics and related issues. Researchers delved into areas such as healthcare in developing countries, knowledge acquisition and dissemination, evaluation of KM practices, attitudes toward KM, the role of hospitals, and the intricacies of the healthcare sector's management.

Over time, these subtopics and variables converged, forming an intricate web of knowledge. Finally, they merged into a singular and cohesive topic: KM in health organizations. This convergence signifies the field's maturation, where diverse research threads have woven together to create a comprehensive understanding of how KM can be effectively applied within healthcare settings.

The Three-Field Plot visually encapsulates this journey of intellectual exploration, illustrating how seemingly disparate research threads have interconnected to establish a well-defined domain. This integrated understanding of KM in health organizations highlights the field's multifaceted nature and underscores its relevance and significance in the ever-evolving healthcare landscape.

In conclusion, our compound results offer a unique perspective on the evolution of KM in health organizations, from its broad inception to its current state as a cohesive and critical study area. This integration of findings demonstrates the complexity and richness of the field while emphasizing the need for ongoing research and innovative approaches to KM within the healthcare sector.

4.6. Results interpretation

The presented data visualizations and statistics shed light on several critical aspects of KM in health organizations. However, to provide a deeper understanding of the implications of these findings for the field, we will now delve into a more comprehensive analysis.

The analysis of the most frequent keywords (RQ1) reveals the significant focus areas within health organizations' KM domain. Understanding these keywords is vital for researchers and practitioners as it indicates the core themes and topics of interest. For instance, the prominence of keywords such as "electronic health records," "information systems," and "patient data" suggests the growing relevance of digital platforms and data management within healthcare. This insight underscores the need for continued research and innovation in these areas to improve KM practices in health organizations.

Identifying the most referenced authors (RQ2) not only recognizes the thought leaders in the field but also provides an opportunity to explore their contributions further. Researchers and policymakers can benefit from studying the works of these influential authors to gain deeper insights into effective KM strategies. It also indicates collaboration potential in the academic community, offering opportunities for future joint research efforts.

Analyzing the most referenced sources and documents (RQ3) helps to pinpoint the foundational literature in this area. By examining these key sources, researchers can build a strong theoretical foundation for their work and gain a historical perspective on the evolution of KM in healthcare. This is instrumental in designing research agendas that build upon existing knowledge.

Exploring the most referenced organizations and countries (RQ4) highlights the geographical and institutional centers of excellence and points to potential disparities and collaboration opportunities. These insights can guide policymakers and healthcare leaders in fostering cross-border and inter-organizational knowledge exchange, ultimately contributing to the global improvement of healthcare systems.

Lastly, understanding the most recent research trends (RQ5) is crucial for staying up-to-date with health organizations' evolving KM landscape. As the healthcare sector is continually shaped by technological advancements, policy changes, and evolving patient needs, recognizing these trends is fundamental. By identifying areas of recent interest, such as "telemedicine" or "data analytics," researchers and practitioners can align their efforts with the current demands of the industry.

5. Discussion

The present bibliometric study aimed to analyze the research trends and patterns in KM in health organizations from 1996 to 2023. The study systematically collected and analyzed 168 articles from the Scopus database using RStudio from Biblioshiny, VOSviewer, and KnowledgeMatrix Plus. The study's findings provide valuable insights into the current state of research in KM in health organizations.

The analysis of publication trends revealed that the interest in KM in health organizations has been steadily increasing over the past few decades. The number of publications has risen significantly recently, especially within the last decade, indicating that the topic is still relevant and actively being researched. This is consistent with previous studies that have shown an increasing interest in KM in healthcare organizations (Ham, 2003; Rocha et al., 2012).

In comparing the results of this article with those of previous studies, it's evident that the findings of this research align with the existing body of knowledge in KM in healthcare organizations. Notably, the key findings of this study, such as the increasing interest in the field and the predominance of empirical research, are consistent with several previous studies Abidi (2001) addressed the

importance of KM in healthcare, setting a foundation for the recognition of knowledge-driven decision support services. Ham (2003) emphasized the role of health information in enhancing the performance of health services, which aligns with the current study's focus on KM. Rocha et al. (2012) also conducted a systematic review, demonstrating the field's commitment to evidence-based research, similar to the predominance of research articles in the present study. Sharma et al. (2005) have long highlighted the significance of KM in healthcare settings, reinforcing the importance of this research area. Waring et al. (2014) conducted an ethnographic study of knowledge sharing in healthcare, supporting that KM in health organizations revolves around practical applications and real-world knowledge sharing.

The bibliometric analysis also revealed that most health organizations' KM publications were research articles, with fewer review articles. This indicates that the field is focused on empirical research, and researchers are actively conducting studies to understand and apply KM principles in health organizations.

The most important results of the study were: Overall, the present study's findings highlight the importance of KM in health organizations and provide insights into the current research trends and patterns. The study provides a foundation for future research and offers a starting point for researchers and practitioners interested in KM in health organizations.

The study's findings resonate with the broader body of research, reaffirming the increasing interest in KM within health organizations and the predominant focus on empirical research. These findings add to the collective understanding of KM in healthcare, building upon and extending prior research efforts. The study yielded significant outcomes, underscoring the role of KM within health organizations. These findings offer insights into prevalent research trends and patterns. Moreover, the study establishes a sturdy groundwork for future investigations, serving as a focal point for researchers and practitioners interested in this facet of health organization management.

6. Conclusion

In conclusion, this bibliometric study has comprehensively analyzed research trends and patterns in KM within health organizations. The findings presented in this study demonstrate a significant and sustained increase in interest and research activity in this field, especially over the past decade. These results underscore the continued relevance and importance of KM in healthcare.

One of the notable insights from our analysis is the predominant focus on empirical research within the domain of KM in health organizations. This emphasis on empirical studies signifies a strong commitment among researchers to understand and actively apply KM principles in practical healthcare settings. Furthermore, our study has unveiled

valuable information regarding influential articles, authors, research institutions, and countries in this field. These insights serve as a valuable resource for researchers, practitioners, and policymakers, helping them navigate the wealth of knowledge within the realm of KM in health organizations.

By employing various bibliometric tools and methodologies, our study has illuminated the current state of research in KM within health organizations. Identifying key research themes, collaborative patterns, and emerging trends contributes significantly to the collective understanding of this domain and offers a roadmap for future research endeavors.

The outcomes of this study hold practical implications for authors, researchers, and practitioners in healthcare KM. The insights provided can assist in identifying research gaps and developing effective strategies to promote KM within health organizations. Additionally, the foundation laid by this study encourages further exploration and advancement in the field, offering an invaluable starting point for those interested in enhancing KM practices within healthcare settings.

In this bibliometric study, it's important to acknowledge several limitations. Firstly, the study's reliance on the Scopus database may introduce potential biases, as not all articles on KM in health organizations may be indexed in this database. Furthermore, the accuracy and completeness of the data are contingent on the quality and consistency of records within the database. Secondly, there might be inherent biases in the data, as the prominence of an article or author does not always reflect their actual impact in the field. The choice of keywords used in the analysis can influence which articles are included, potentially omitting relevant contributions due to variations in terminology. Lastly, the study's scope is bounded by the selected timeframe (1996-2023) and the choice of Scopus as the primary data source, which may exclude more recent or niche developments and contributions from non-indexed journals. These limitations emphasize the need to interpret the findings while considering these constraints, and future research should aim to address some of these limitations for a more comprehensive understanding of KM in health organizations. In summary, this article contributes a robust and comprehensive analysis of research trends in KM within health organizations. The findings add to the growing body of knowledge in this field and provide practical guidance for future research and practice, facilitating the development of effective KM strategies in healthcare.

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Compliance with ethical standards

Ethical considerations

The use of data from the Scopus database adhered to the platform's terms of use and licensing agreements. All data used in this study was publicly available, and no ethical concerns regarding data usage permissions were encountered.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Abidi SSR (2001). Knowledge management in healthcare: Towards 'knowledge-driven' decision-support services. International Journal of Medical Informatics, 63(1-2): 5-18. https://doi.org/10.1016/S1386-5056(01)00167-8 **PMid:11518661**

Alajmi BM, Marouf LN, and Chaudhry AS (2016). Knowledge management for healthcare: Investigating practices that drive performance. Journal of Information and Knowledge Management, 15(02): 1650014. https://doi.org/10.1142/S0219649216500143

Alavi M and Leidner DE (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. MIS Quarterly, 25(1): 107-136. https://doi.org/10.2307/3250961

Ali NA, Tretiakov A, Whiddett D, and Hunter I (2017). Knowledge management systems success in healthcare: Leadership matters. International Journal of Medical Informatics, 97: 331-340. https://doi.org/10.1016/j.ijmedinf.2016.11.004 **PMid:27919392**

Ali NA, Whiddett D, Tretiakov A, and Hunter I (2012). The use of information technologies for knowledge sharing by secondary healthcare organisations in New Zealand. International Journal of Medical Informatics, 81(7): 500-506. https://doi.org/10.1016/j.ijmedinf.2012.02.011 **PMid:22460023**

Ayatollahi H and Zeraatkar K (2020). Factors influencing the success of knowledge management process in health care organisations: A literature review. Health Information and Libraries Journal, 37(2): 98-117. https://doi.org/10.1111/hir.12285 **PMid:31872968**

Ayatulloh D, Nursalam N, Dian and Kurniawati N (2021). The effect of knowledge management in healthcare services: A systematic review. Jurnal Pendidikan Keperawatan Indonesia, 7(1): 102–116. https://doi.org/10.17509/jpki.v7i1.35132

Bate SP and Robert G (2002). Knowledge management and communities of practice in the private sector: Lessons for modernizing the national health service in England and Wales. Public Administration, 80(4): 643-663. https://doi.org/10.1111/1467-9299.00322

Bose R (2003). Knowledge management-enabled health care management systems: Capabilities, infrastructure, and decision-support. Expert Systems with Applications, 24(1): 59-71. https://doi.org/10.1016/S0957-4174(02)00083-0

Carasso S, Arbiv T, Yariv I, On E, Ashkenazi I, and Levi H (2005). Knowledge management in health organizations. Harefuah, 144(7): 474-479.

Charles D (1999). Knowledge management(s). Journal of Knowledge Management, 3(2): 110-123. https://doi.org/10.1108/13673279910275567

Davenport TH and Prusak L (1998). Working knowledge: How organizations manage what they know. Harvard Business Press, Brighton, USA.

de Souza VP, Baroni R, Choo CW, Castro JMD, and Barbosa RR (2021). Knowledge management in health care: An integrative and result-driven clinical staff management model. Journal of Knowledge Management, 25(5): 1241-1262. https://doi.org/10.1108/JKM-05-2020-0392

Donthu N, Kumar S, Mukherjee D, Pandey N, and Lim WM (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business Research, 133: 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Dwivedi A, Bali RK, James AE, Naguib RNG, and Johnston D (2002). Merger of knowledge management and information technology in healthcare: Opportunities and challenges. In the IEEE CCECE2002. Canadian Conference on Electrical and Computer Engineering. Conference Proceedings (Cat. No.02CH37373), IEEE, Winnipeg, Canada, 2: 1194-1199. https://doi.org/10.1109/CCECE.2002.1013118

Edmondson AC, Bohmer RM, and Pisano GP (2001). Disrupted routines: Team learning and new technology implementation in hospitals. Administrative Science Quarterly, 46(4): 685-716. https://doi.org/10.2307/3094828

El Morr C and Subercaze J (2010). Knowledge management in healthcare. In: Cruz-Cunha MM, Tavares AJ, and Simoes R (Eds.), Handbook of research on developments in e-health and telemedicine: Technological and social perspectives: 490-510. IGI Global, Pennsylvania, USA. https://doi.org/10.4018/978-1-61520-670-4.ch023

Fennessy G (2001). Knowledge management in evidence-based healthcare: Issues raised when specialist information services search for the evidence. Health Informatics Journal, 7(1): 4-7. https://doi.org/10.1177/146045820100700102

Ferlie E, Crilly T, Jashapara A, and Peckham A (2012). Knowledge mobilisation in healthcare: A critical review of health sector and generic management literature. Social Science and Medicine, 74(8): 1297-1304. https://doi.org/10.1016/j.socscimed.2011.11.042 **PMid:22385813**

Ghosh B and Scott JE (2005). Comparing knowledge management in health-care and technical support organizations. IEEE Transactions on Information Technology in Biomedicine, 9(2): 162-168. https://doi.org/10.1109/TITB.2005.847202 **PMid:16138532**

Ham C (2003). Improving the performance of health services: The role of clinical leadership. The Lancet, 361(9373): 1978-1980. https://doi.org/10.1016/S0140-6736(03)13593-3 **PMid:12801754**

Han J and Pashouwers R (2018). Willingness to share knowledge in healthcare organisations: The role of relational perception. Knowledge Management Research and Practice, 16(1): 42-50. https://doi.org/10.1080/14778238.2017.1405144

Huysman MH and De Wit DH (2013). Knowledge sharing in practice. Volume 4, Springer Science and Business Media, Berlin, Germany.

Jones A (2016). The role of employee whistleblowing and raising concerns in an organizational learning culture–Elusive and laudable?: Comment on "cultures of silence and cultures of voice: The role of whistleblowing in healthcare organisations." International Journal of Health Policy and Management, 5(1):

67-69.
https://doi.org/10.15171/ijhpm.2015.182
PMid:26673654 PMCid:PMC4676976

Jorge CFB, Valentim MLP, Sutton MJ, and De Sordi JO (2021). Complexity and knowledge in organisational context: Concepts, approaches, boundaries and relations. Journal of Information and Knowledge Management, 20(04): 2150041.
https://doi.org/10.1142/S0219649221500416

Karamat J, Shurong T, Ahmad N, Afridi S, Khan S, and Mahmood K (2019). Promoting healthcare sustainability in developing countries: Analysis of knowledge management drivers in public and private hospitals of Pakistan. International Journal of Environmental Research and Public Health, 16(3): 508.
https://doi.org/10.3390/ijerph16030508
PMid:30759728 PMCid:PMC6388157

Karamitri I, Talias MA, and Bellali T (2017). Knowledge management practices in healthcare settings: A systematic review. The International Journal of Health Planning and Management, 32(1): 4-18.
https://doi.org/10.1002/hpm.2303 **PMid:26153388**

Littlejohns P, Wyatt JC, and Garvican L (2003). Evaluating computerised health information systems: Hard lessons still to be learnt. British Medical Journal, 326(7394): 860-863.
https://doi.org/10.1136/bmj.326.7394.860
PMid:12702622 PMCid:PMC153476

McNulty T (2002). Reengineering as knowledge management: A case of change in UK healthcare. Management Learning, 33(4): 439-458. https://doi.org/10.1177/1350507602334003

Middleton B, Bloomrosen M, Dente MA, Hashmat B, Koppel R, Overhage JM, Payne TH, Rosenbloom ST, Weaver C, and Zhang J (2013). Enhancing patient safety and quality of care by improving the usability of electronic health record systems: Recommendations from AMIA. Journal of the American Medical Informatics Association, 20(e1): e2-e8.
https://doi.org/10.1136/amiajnl-2012-001458
PMid:23355463 PMCid:PMC3715367

Mostafa GM, Shazly MM, and Sherief WI (2009). Development of a waste management protocol based on assessment of knowledge and practice of healthcare personnel in surgical departments. Waste Management, 29(1): 430-439.
https://doi.org/10.1016/j.wasman.2007.12.009
PMid:18316184

Naik N, Hameed BZ, Sooriyaperakasam N, Vinayahalingam S, Patil V, Smriti K, Saxena J, Shah M, Ibrahim S, Singh A, and Karimi H et al. (2022). Transforming healthcare through a digital revolution: A review of digital healthcare technologies and solutions. Frontiers in Digital Health, 4: 919985.
https://doi.org/10.3389/fdgth.2022.919985
PMid:35990014 PMCid:PMC9385947

Oborn E, Barrett M, and Racko G (2013). Knowledge translation in healthcare: Incorporating theories of learning and knowledge from the management literature. Journal of Health Organization and Management, 27(4): 412-431.
https://doi.org/10.1108/JHOM-01-2012-0004
PMid:24003630

Rocha ES, Nagliate P, Furlan CE, Rocha Jr K, Trevizan MA, and Mendes IA (2012). Knowledge management in health: A systematic literature review. Revista Latino-Americana de Enfermagem, 20: 392-400.
https://doi.org/10.1590/S0104-11692012000200024
PMid:22699742

Shahmoradi L, Safadari R, and Jimma W (2017). Knowledge management implementation and the tools utilized in healthcare for evidence-based decision making: A systematic review. Ethiopian Journal of Health Sciences, 27(5): 541-558.
https://doi.org/10.4314/ejhs.v27i5.13
PMid:29217960 PMCid:PMC5615016

Sharma SK, Wickramasinghe N, and Gupta JN (2005). Knowledge management in healthcare. Creating knowledge-based healthcare organizations. IGI Global, Pennsylvania, USA.
https://doi.org/10.4018/978-1-59140-459-0.ch001

Van Beveren J (2003). Does health care for knowledge management? Journal of Knowledge Management, 7(1): 90-95. https://doi.org/10.1108/13673270310463644

Waring J, Marshall F, Bishop S, Sahota O, Walker M, Currie G, and Avery T (2014). An ethnographic study of knowledge sharing across the boundaries between care processes, services and organisations: The contributions to 'safe' hospital discharge. NIHR Journals Library, Southampton, UK: 25642570.
https://doi.org/10.3310/hsdr02290 **PMid:25642570**

Winschiers-Theophilus H, Zaman T, Maasz D, Muashekele C, Mbinge U, Jengan G, Stanley C, and Ab Hamid K (2022). Indigenous knowledge fairs: A new approach to pluralistic knowledge dissemination in HCI. In the Adjunct Proceedings of the 2022 Nordic Human-Computer Interaction Conference, Association for Computing Machinery, Aarhus, Denmark: 1-5.
https://doi.org/10.1145/3547522.3547687

Zupic I and Čater T (2015). Bibliometric methods in management and organization. Organizational Research Methods, 18(3): 429-472. https://doi.org/10.1177/1094428114562629