

Knowledge Management Factors as Building Blocks of Quality of Care in Healthcare Systems

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Purpose: The aim of the study was to review national and international professional literature on the impact of knowledge management factors on the quality of care in healthcare systems.

Methodology: A review of national and international professional literature was conducted using Scopus, CINAHL, ScienceDirect, and ProQuest databases to search for freely accessible scientific articles and doctoral dissertations. We searched for doctoral dissertations in the Slovenian language of the University of Primorska, the University of Ljubljana, the University of Maribor, and the electronic library of the Faculty of Organizational Studies in Novo Mesto. We further searched for doctoral dissertations in English in the PQDT Open database. We identified 201 articles and 9 doctoral dissertations. After the screening phase, we included 19 full-text articles in the study.

Results: We identified the following key knowledge management factors that impact the quality of patient care in the healthcare system: knowledge acquisition, knowledge sharing, knowledge application, knowledge storage, and leadership.

Conclusion: The literature review showed that the application of knowledge management factors contributes to more productive and efficient work within the healthcare system. Additionally, these knowledge management factors have a positive impact on the implementation of improvements, job performance, job satisfaction, and the quality of healthcare services.

Keywords: *Knowledge acquisition, Knowledge sharing, Knowledge application, Knowledge storage, Leadership*

1 Introduction

Knowledge management systems in healthcare facilitate the effective implementation of knowledge acquisition, utilization, and sharing, thereby facilitating knowledge flow (Gonçalves & Curado, 2023, p. 421). In the healthcare sector, including hospitals, clinics, pharmacies, and also among users, the significance of knowledge in conjunction with knowledge sharing, the reduction of ad-

ministrative costs, and the enhancement of care quality is well known (Bose, 2003, p. 59). Knowledge management strategies are increasing the effectiveness of healthcare institutions (Karamitri, 2020, p. 1). Bose (2003, p. 63) researched knowledge management in healthcare systems and described the knowledge management cycle, which encompasses knowledge creation, structuring, dissemination, and application. Karlton et al. (2020, p. 214) found that by considering knowledge management mechanisms,

1 Introduction

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Within the research, we identified key knowledge management factors that influence the quality of patient care.

2 Literature review

2.1 Knowledge

Knowledge has a significant impact on organizational culture, it creates success and contributes to organizational efficiency (De La Torre Sanclemente et al., 2019, p. 330). Avramchuk (2020, p. 22) has pointed out that there are two types of knowledge: knowledge already known within the organization (explicit) and knowledge that can be acquired through experiential learning (tacit). Knowledge is one of the most important values of any nation, crucial for achieving sustainability and competitiveness. Knowledge needs to be created, preserved, and nurtured, in other words, managed (Csath, 2020, p. 7). Knowledge management comprises both knowledge management processes and knowledge management systems. Knowledge management processes include knowledge creation, knowledge sharing, and knowledge application. Knowledge management systems include the systems, guidelines, processes, and procedures used for knowledge creation, storage, sharing, and reuse of knowledge (Ghosh et al., 2006, p. 74).

2.2 Knowledge management

The origins of knowledge management trace back to the 1990s, when Nonaka and Takeuchi (1995, p. 62) studied the success of Japanese companies in achieving cre-

ativity and innovation. They introduced the “Knowledge Spiral” model, which includes four modes of knowledge conversion: 1) from tacit knowledge to tacit knowledge: the socialization process; 2) from tacit knowledge to explicit knowledge: the externalization process; 3) from explicit knowledge to explicit knowledge: the combination process; and 4) from explicit knowledge to tacit knowledge: the internalization process. Socialization involves the dissemination of tacit knowledge among individuals through social interactions, such as collaborative work, spending time together, and informal gatherings. The processes of externalization, combination, and internalization are crucial steps in converting tacit knowledge into explicit knowledge and back into tacit form, facilitating the creation, combination, and utilization of knowledge at both individual and organizational levels. Internalization allows this explicit knowledge to be reintegrated into an individual’s tacit knowledge base, fostering further processes of socialization and knowledge creation (Nonaka and Takeuchi, 1995, pp. 63-70).

As a response to social development, knowledge management models have evolved and adapted over the years. Managers who understand the significance of knowledge for organizational success should work towards developing a supportive knowledge management system (Stojanović-Aleksić, 2019, p. 1559), which, as a process, enables organizations to share, create, and consolidate knowledge to achieve their goals (Gold et al., 2001, p. 187). Knowledge management helps organizational leaders leverage employee knowledge for developing processes and technologies, support strategic decisions, drive innovation, and enhance competitiveness (Yan & Zhang, 2019, p. 205). The core of knowledge management is the objectification of knowledge within the work environment (Avramchuk, 2020, p. 23). There are significant differences in knowledge management practices among individual member states of the European Union. Csath (2021, p. 7) warns that a business system with weak knowledge management factors cannot be successful in the long term. Therefore, he emphasizes that each member of the European Union should balance the cultivation and development of human capital to maintain uniform growth and competitiveness.

2.3 Knowledge management in the healthcare systems

Knowledge management is well-known and developed in business environments, and it is also recognized in the healthcare system, where it represents a systematic approach to creating, managing, and sharing knowledge within healthcare organizations. This approach is based on the identification, capture, development, and effective use of knowledge to improve service quality, efficiency, and innovation in healthcare processes (Karamitri et al., 2020, pp. 11-12). Knowledge management is important in

business and in healthcare organizations that aim to leverage their intellectual resources and gain a competitive advantage in the market (Karamitri et al., 2020, p. 10). Future challenges in healthcare include patient-centered care, integration, clinical outcomes, the development and implementation of information technology, investment in people, training, and education (Pihlainen et al., 2019, p. 13). Rapid advancements in knowledge related to patient diagnostics and treatment highlight the need for developing knowledge management systems to support new information technology and treatment methods (Phan et al., 2022, p. 1). The World Health Organization also emphasizes the importance of knowledge management, identifying the following goals for its development (WHO, 2005, pp. 8-11): the use of information technology in the healthcare system; strengthening systematic knowledge management approaches in the healthcare system (assessment of needs, planning, and evaluation); enhancing national knowledge management programs; bolstering information technology infrastructure in healthcare institutions; human resource development; supporting knowledge transfer; promoting knowledge creation; and establishing knowledge hubs.

The use of knowledge management in healthcare in-

stitutions enhances organizational performance and quality of care, while also helping to reduce costs and errors (Ayatollahi & Zeraatkar, 2019, p. 113). Knowledge management has a significant impact on the financial status of healthcare institutions, leadership of these institutions, quality of care, patient safety, and it influences the methods of working, learning, development, and knowledge-seeking by healthcare professionals (Kosklin et al., 2023, p. 746). Knowledge represents a strategic resource in healthcare organizations, and knowledge management facilitates the successful overcoming of challenges in the healthcare system such as rising healthcare costs and improving the quality of care (Ayatollahi & Zeraatkar, 2019, p. 98).

3 Methodology

A systematic review of national and international literature was conducted using the databases Scopus, CINAHL, ScienceDirect, and ProQuest, to search for open-access scientific and professional articles, as well as doctoral dissertations. The search results were limited to Slovene, English, Serbo-Croatian, and Spanish languages.

Table 1: Inclusion and Exclusion Criteria

<i>Criterion type</i>	<i>Inclusion Criteria</i>	<i>Exclusion Criteria</i>
Topic	Studies related to factors of knowledge management	Studies not addressing factors of knowledge management
Research Type	Qualitative and quantitative research	Systematic literature reviews
Time Frame	Between 2014 and 2024	Older than 2014
Language	Slovene, English, Serbo-Croatian and Spanish	Other languages
Full-Text Availability	YES	NO

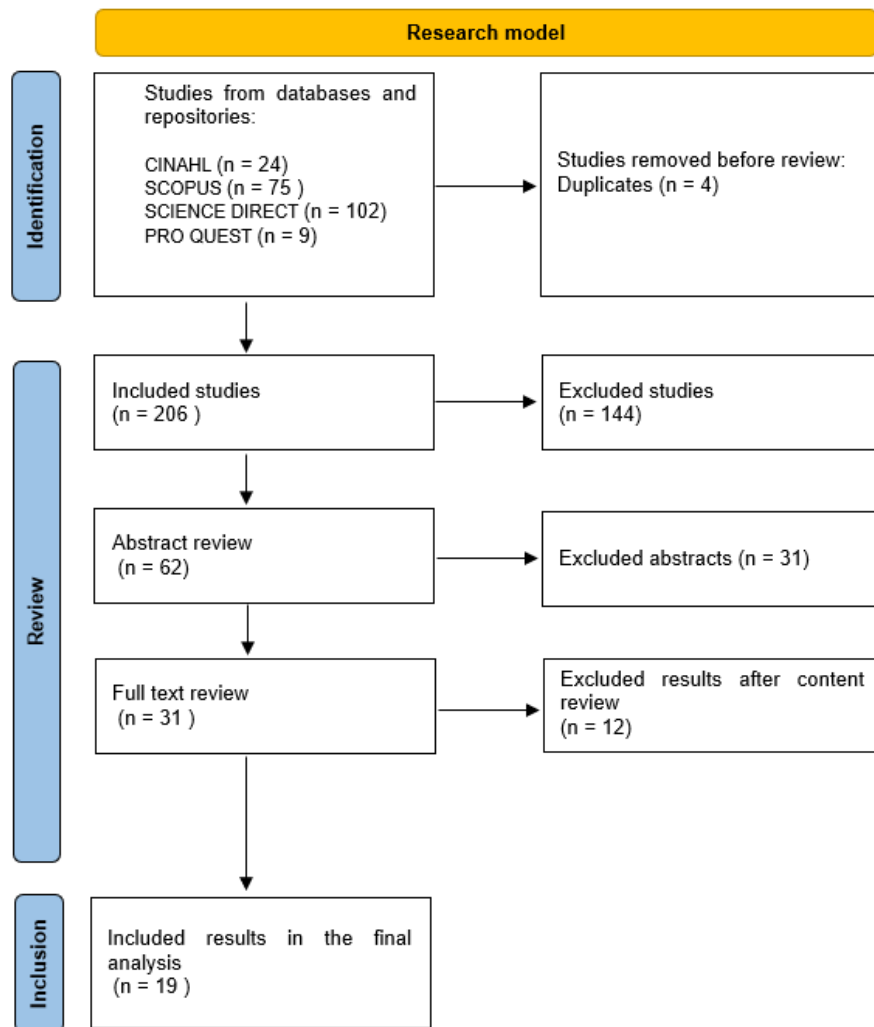


Figure 1: Research Model

We searched by title (TITLE-ABS-KEY) using the search terms “knowledge management,” “model,” “healthcare,” and the conjunction AND. Doctoral dissertations in Slovene were searched in the repositories of the University of Primorska, University of Ljubljana, University of Maribor, and the electronic library of the Faculty of Organizational Studies in Novo Mesto, while dissertations in the English language were searched in the PQDT Open database. Inclusion and exclusion criteria are presented in Table 1.

The database search resulted in a total of 201 articles and nine doctoral dissertations (Figure 1). After removing duplicates, a further review was conducted based on combinations of titles, abstracts, and keywords. Following the screening phase, we reviewed 19 full-text documents to identify key factors in knowledge management and their impact on quality. Upon reviewing the existing literature,

we did not find a comprehensive review of empirical studies on the influence of knowledge management factors on the quality of care in the healthcare system.

4 Results

The review of relevant literature included 19 empirical scientific articles, with key findings presented in Table 2.

Among the 19 articles included in the literature review, 11 authors utilized quantitative research methods, 7 employed qualitative methods, and one author opted for

Table 2: Key Findings from Empirical Studies on Knowledge Management in Healthcare

Authors	Methods	Findings
Aljazzazen & Schmuck (2021, pp. 267, 274)	Quantitative research (data analysis)	The research results confirm a statistically significant correlation between knowledge management factors and the implementation of improvements within the organization using the Lean Six Sigma method.
Aradati et al. (2019, pp. 1, 2, 5, 7)	Qualitative research (interview/observation)	The use of knowledge management tools contributes to more efficient and productive work in call centers for mental health support.
Bahar & Bahri (2017, pp. 80, 81)	Qualitative research (interview)	The findings of the study indicate that a focused knowledge management strategy within healthcare organizations helps physicians and nurses improve current clinical practices in a clinical environment.
Baptista et al. (2019, pp. 1, 6)	Observational, quantitative, descriptive research	The study demonstrated a positive impact on the efficiency of nurses perioperative decision-making through the implementation of an electronic system compared to written documentation.
Fadaie et al. (2023, pp. 1, 6, 7)	Quantitative research (data analysis)	The knowledge management processes positively impacted work performance and increased job satisfaction. However, there was no significant relationship found between knowledge sharing and increased job satisfaction.
Gonçalves & Curado (2023, pp. 421, 424, 427)	Quantitative research (data analysis)	The research found that knowledge management factors positively contribute to the accumulation of employees' knowledge and have a positive impact on the quality of care. Additionally, they negatively affect the occurrence of conflicts regarding workload allocation among healthcare workers. Knowledge hiding is positively associated with workload allocation conflicts and decreases the quality of care.
Karamat et al. (2019, pp. 1, 8, 9)	Quantitative research (data analysis)	The research results have shown that organizational and strategic barriers negatively impact the implementation of knowledge management, while government and healthcare system-related enablers positively influence the implementation of knowledge management.
Karamitri et al. (2020, pp. 10, 11, 12)	Quantitative research (data analysis)	The study confirmed that the questionnaire is reliable, valid, and suitable for collecting information on knowledge management processes in healthcare organizations and can contribute to the overall success of healthcare organizations.
Karltun et al. (2019, p. 205, 207, 213)	Combined research; document review, qualitative approach (semi-structured interviews), observation	The study found that hospital leaders with appropriate knowledge management infrastructure contribute to the improvement of healthcare quality.
Kejžar et al. (2023, pp. 4, 5, 8, 11)	Quantitative research (data analysis)	The study confirmed a statistically significant correlation between awareness of the importance of knowledge management and the quality of care in four nursing homes in Slovenia.
Leal et al. (2018, pp. 279, 288, 289)	Quantitative research (data analysis)	The research has shown that formal knowledge sharing positively influences job satisfaction.
Lee et al. (2014, pp. 1, 5, 7, 10)	Quantitative research (data analysis)	The research has shown that knowledge-sharing culture and organizational learning are key factors influencing the success of nursing. They measured effectiveness (desire, attitude) and the utilization of the healthcare process.
Lunden et al. (2018, pp. 6, 12, 15)	Qualitative research (interview)	The study found that leaders in healthcare organizations prioritize day-to-day knowledge management over promoting knowledge management and advance planning of knowledge management.
Pereira de Souza et al. (2020, pp. 6, 7, 9, 18)	Qualitative research (case study, semi-structured interview)	The study addresses how the ability to perceive, as a new element of knowledge management, includes sensemaking processes, knowledge creation, and decision-making. Information technology and the operation of the healthcare system were identified as supportive factors of knowledge management.
Popa & Ștefan (2019, pp. 6, 14, 15)	Quantitative research (data analysis)	The study has shown positive and statistically significant correlations between the knowledge management process and the quality of healthcare, as well as socio-economic outcomes at the organizational level.
Roohi et al. (2022, pp. 1, 3, 5, 9)	Qualitative research (semi-structured interview); conducted in two phases	A model was developed to assist healthcare system leaders in implementing knowledge management. They measured users' experiences, practitioner experiences, assessment of managerial decisions, capabilities, intentions, and the role, skills, and attributes of managers.

Table 2: Key Findings from Empirical Studies on Knowledge Management in Healthcare (continues)

Authors	Methods	Findings
Rodríguez Marino et al. (2022, pp. 1, 3, 7, 13, 14)	Qualitative research (semi-structured interview) Quantitative research (data analysis)	By implementing the knowledge generation and transfer model, call center agents were able to standardize work methods and increase service levels, reduce the average response time of the call center, and enhance efficiency (number of calls handled).
Silva et al. (2021, pp. 3, 7)	Qualitative research (semi-structured interview)	The research results have shown that the experience of the teaching and learning process among professors and students has a positive impact on research in terms of scientific principles, particularly regarding the ability to formulate research problems early and critical thinking.
Tehranineshat & Rakhshan (2018, pp. 5, 10)	Quantitative research (data analysis)	The study findings have indicated a statistically significant correlation between knowledge management and creativity among undergraduate and graduate students.

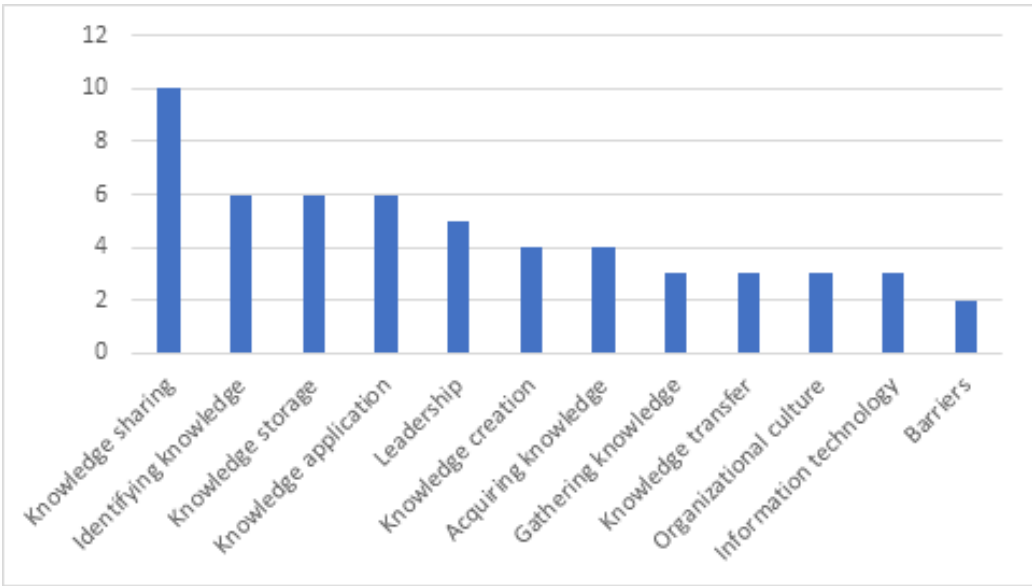


Figure 2: Frequency of the most mentioned knowledge management factors

mixed methods research. Nearly half ($n = 9$) of the studies were conducted in Asia, slightly fewer in Europe ($n = 7$), and South America ($n = 3$). The presented results are based on samples totalling 3,086 respondents, 271 interviewees, 991 call analyses, and 193 hours of observation.

In the articles, we identified knowledge management factors that the authors investigated. Among all knowledge management factors, knowledge sharing was described in half of the studies. This finding is consistent with a study of the Portuguese healthcare system (Leal et al., 2018, pp. 279-289), which identified knowledge sharing as one of the key factors of knowledge management and highlighted its significance in indicating employees' willingness to share their expertise.

In Figure 1, we depict the factors influencing knowledge management that authors most frequently studied:

knowledge sharing, knowledge recognition, knowledge utilization, knowledge storage, leadership (where we combined variables such as management system, leadership culture, and innovative leadership), knowledge acquisition, and knowledge creation.

5 Discussion

Through the acquisition, collaboration, sharing, and development of healthcare workers' knowledge management contributes to the higher quality of healthcare (Popa & Ștefan, 2019, pp. 14-15). Knowledge management is not a linear process but a repetitive one, where individual phases intertwine to improve or achieve specific goals. The phases of knowledge acquisition, collection and anal-

ysis, and organization are particularly repetitive (Bahar & Bahri, 2017, p. 81). Pereira (2022, pp. 22-27) explored the relationships between the characteristics of knowledge and the connection between implementation methods and the realization of knowledge management characteristics. Knowledge creation, organization, sharing, and application are crucial for ensuring the quality of services in healthcare organizations, highlighting the importance of appropriate knowledge management. The findings emphasize the balance between evidence-based practice (explicit knowledge) and patient-centered (tacit knowledge) in both internal processes and overall performance. The complexity of clinical decisions, which should be based on knowledge exchange, is highlighted. While internal processes focus on improving communication and the efficiency of measures, overall performance emphasizes service quality and patient-centeredness. To improve the quality of healthcare in an organization, it is important to recognize and share the knowledge and experiences in the organization. Therefore, identifying the fundamental factors of knowledge management, which are applied to effectively manage and share specific professional knowledge, is crucial for improving the quality of healthcare (Lee et al., 2014, p. 10).

The process of knowledge management encourages and supports intra- and inter-organizational collaboration, which is crucial for preventing errors and ensuring the quality of care (Popa & Ștefan, 2019, pp. 14-15). Knowledge management has a significant impact on the implementation of business strategies for improving processes and quality, as well as reducing costs in organizations. Success depends on how well employees adapt to the standards of the new business strategy and how effectively they learn (Aljazzazen & Schmuck, 2021, pp. 267-279). Knowledge management contributes to the improvement of healthcare quality and socio-economic outcomes (Popa & Ștefan, 2019, pp. 14-15).

The quality of services depends on both informal and formal knowledge sharing; therefore, organizations should enhance the transfer of explicit knowledge and the sharing of tacit knowledge (Leal et al., 2018, pp. 279-289). A cross-sectional study by Popa and Ștefan (2019, pp. 15-16) shows that knowledge management factors have a direct impact on employee satisfaction, patient satisfaction, and patient health, thus indirectly influencing the quality of healthcare.

From the descriptions of less researched factors in knowledge management, we have identified several interesting findings. The factor "sensemaking" was recognized as an important element in efforts to achieve strategic goals and strengthen commitment. Collective sensemaking fosters professional development (Pereira de Souza et al., 2020, p. 11).

We have identified the following five key knowledge management factors based on a focused review of the lit-

erature from the past ten years on the impact of knowledge management factors on the quality of patient care in the healthcare system:

5.1 Identifying Knowledge / Knowledge Recognition / Knowledge Creation

Due to similar characteristics, we combined the factors "Knowledge Recognition," "Knowledge Creation," and "Identifying knowledge" under the collective term "Knowledge Identifying." Information is gathered through direct observations, examinations, patient history, reports, and laboratory test results. Healthcare workers also acquire information from clinical guidelines, quick reference handbooks, and textbooks. Physicians and nurses determine which knowledge/information they need to perform interventions (assessment, diagnosis, treatment, monitoring, prognosis, and further referrals). Four types of knowledge/information have been identified in the clinical environment: personal knowledge and competencies; patients' experiences of illness and health conditions; clinical evidence and professional guidelines; and technical knowledge. The process of analysis is followed by the documentation of useful information and knowledge (Bahar & Bahri, 2017, pp. 80-81).

5.2 Knowledge Sharing / Knowledge Transfer

The group of factors named "Knowledge Transfer" by the authors (Kejžar et al., 2023, pp. 4-11; Rodríguez Marino et al., 2022, pp. 1-14) has been merged with the variable "Knowledge Sharing" due to similar factors. The key purpose of knowledge management in organizations is to create conditions for effective knowledge sharing. The success or failure of knowledge management depends on how effectively employees in a healthcare organization share and utilize their knowledge (Lee et al., 2014, pp. 1-10). Healthcare workers exchange intellectual knowledge among themselves. There are various methods that physicians and nurses use to disseminate information. Informal methods include social networks and various applications, while more formal methods include professional training, meetings, and electronic communication (email, social networks) (Bahar & Bahri, 2017, p. 81). Research results among Portuguese healthcare workers have shown that formal knowledge-sharing practices increase employee satisfaction, organizational performance, and reduce turnover intention (Leal et al., 2018, pp. 279-289). For effective nursing, employees need to have a great deal of complex knowledge and skills, so it is crucial to recognize the knowledge and experience of individual nurses and share it throughout the organization (Lee et al., 2014,

pp. 1-10).

5.3 Knowledge Application

In the clinical environment, knowledge application is the process through which healthcare professionals develop solutions to problems in providing patient care. Based on their knowledge, they formulate a patient care plan according to the current condition, circumstances, and available resources. They make decisions about procedures, methods of implementation, and the involvement of other healthcare professionals (Bahar & Bahri, 2017, p. 81).

5.4 Knowledge Storage

The results of solving clinical problems are useful for future use, but unfortunately, this type of knowledge/information is mostly recorded in individuals' memories. Details such as patient information, medical reports, physical examination results, and the final diagnosis are recorded in the form of computer data or electronic medical records (Bahar & Bahri, 2017). Knowledge in healthcare organizations exists at various levels: the knowledge held by individual healthcare professionals, in databases, documented organizational procedures such as clinical guidelines, and standard operating procedures. Analysis shows that knowledge in the clinical work environment is primarily owned by individuals (i.e., clinical experts), as they are crucial in knowledge acquisition. Clinical experts in healthcare organizations collect knowledge in the form of information and documents and organize it in a simple and meaningful way so that the content is accessible to other employees (Bahar & Bahri, 2017, p. 81).

5.5 Leadership

Knowledge management in nursing is a complex task that requires leaders to have decision-making abilities and the use of various leadership styles and competencies. Therefore, clear guidelines and models are necessary to ensure systematic knowledge management (Lunden et al., 2018, p. 15). Knowledge management strategies help organizational leaders enhance the efficiency of hospitals and other healthcare facilities (Karamitri et al., 2020, pp. 10-12). In the daily work of nursing leaders, activities related to knowledge management focus on ensuring necessary competencies and responding to sudden changes. Leaders must make quick decisions and reallocate staff to ensure appropriate patient care. Knowledge management also involves knowledge transfer, guidance, and the development of a work culture for the near future, as well as long-term activities anticipating future knowledge needs. Nursing leaders often prioritize daily knowledge manage-

ment activities over promoting knowledge and anticipating knowledge needs. Their activities are characterized by an "ad hoc" approach (Lunden et al., 2019, pp. 8-15).

The gap between knowledge and practice, as well as the delay or failure to implement research findings in practice and policy-making, is a contributing factor to the provision of low-quality services (Roohi et al., 2022, pp.1).

The primary goal of research on knowledge implementation in healthcare is to enhance the effectiveness of interventions, ultimately improving healthcare practice and resulting in better care and outcomes for patients and populations (Wensing & Grol, 2019, pp. 5).

The study (Kim & Tomprou, 2021, pp. 12 - 13) investigates the impact of data analytics training and comprehensive organizational changes on the successful implementation of healthcare data analytics. Through a quasi-experimental pre/post-test design, they demonstrated that coordinated interventions facilitate the development of employee goals, leading to improved learning and performance standards, as well as enhanced skills in using data analytics tools. The findings provide practice-oriented evidence highlighting the importance of well-designed training programs in empowering healthcare organizations to establish effective data analytics infrastructures, improve analytical skills, and optimize the use of new tools.

6 Conclusion

The purpose of the study was to identify key knowledge management factors influencing the quality of care in healthcare systems. Through a literature review, five key knowledge management factors were identified: identifying knowledge, knowledge sharing /knowledge transfer, knowledge application, knowledge storage, and leadership. Identifying knowledge in the healthcare environment is crucial for ensuring necessary knowledge and preserving the skills of employees through continuous education and training. Knowledge sharing among healthcare professionals is important for the effective operation of the institution, with knowledge exchanged through various methods, both formal and informal. Knowledge application in the clinical environment enables healthcare professionals to independently and safely perform tasks in providing patient care and making decisions on procedures and methods of implementation. Knowledge storage is an important factor in knowledge management, enabling the collection, analysis, and organization of information and knowledge for later use. Providing appropriate conditions for knowledge to circulate within organizations and systems is within the domain of leaders. Ensuring effective knowledge management is important for providing high-quality healthcare services, which directly impacts social welfare and sustainable development.

A review of the literature on knowledge management

factors in the healthcare system has shown that the use of these factors contributes to a more productive and efficient operation within the healthcare system. Additionally, knowledge management factors positively influence the implementation of improvements, work performance, job satisfaction, and the quality of healthcare. Theory and practice in healthcare management are constantly advancing, and the literature review indicates that knowledge management is necessary and socially beneficial. Ensuring high-quality healthcare services significantly contributes to social welfare by maintaining an active population into old age and ensuring a rapid response throughout the healthcare system to population needs. The research results are useful for both owners and managers in healthcare institutions who are constantly striving to improve working conditions and provide better quality healthcare. A review of professional literature serves as a basis for further research on the impact of knowledge management factors on the quality of care in the healthcare system. An effective knowledge management system is essential for the quality care of patients within the healthcare system. The challenge for healthcare leaders today is to establish a system that both enables and encourages employees to continuously stay updated with advancements and best practices in their professional field.

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