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Smart Healthcare in Urban Contexts: A Bibliometric Review and Managerial Implications

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Abstract

Purpose: This research aims to evaluate existing literature about smart cities in healthcare settings while determining potential future research paths. The research examines digital transformation effects on healthcare delivery as well as healthcare governance and policy within urban environments.
Design/methodology/approach: The research study adopts a structured literature review approach that combines bibliometric and content analysis. The Scopus database provided 617 peer-reviewed articles for this study. The authors conducted multiple screening stages before selecting 48 articles for thorough evaluation using VOSviewer and thematic content coding.
Findings: The analysis shows that the existing research about this topic remains scattered and continues to develop without clear connections between studies. The research identified three main research areas, which include smart cities for health safety, smart cities for health data sharing, and smart cities for developing healthcare skills. The research reveals important managerial and policy implications that healthcare systems can use to boost their performance and resilience through smart urban innovation.
Originality: This paper creates a first-of-its-kind bibliometric map of smart healthcare research in urban areas to present an integrated view of technological managerial and policy-oriented contributions. The research fills an important knowledge gap by establishing a connection between digital health approaches and urban governance frameworks.

Practical implications: The study delivers data-driven guidance for healthcare managers and urban policymakers who want to establish smart health solutions through evidence-based strategic decision support and investment planning and policy development.

Keywords: Smart city, Smart healthcare, Digital transformation, Healthcare management, Urban governance, Bibliometric review, Policy implications.

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1. Introduction

The global healthcare system is undergoing a significant change in the light of technological developments and the spread of digitalization (Khondoker and Islam, 2016; Shailaja *et al.*, 2019). Technologies like the Internet of Things (IoT), Cloud Computing (CC), Big Data Analysis (BDA), Artificial Intelligence (AI) and Machine Learning (ML) have been successively incorporated into healthcare systems to create smart healthcare (Adamu *et al.,* 2020; Ranjan *et al*., 2020; Hurbean *et al.,* 2021; Alzahrani and Alfouzan, 2022; Bhardwaj *et al.,* 2022; Saviano *et al*., 2024; Gagliardi *et al.,* 2024). From being just a theoretical framework, it has now become a practical and widely used model of care (Chiu *et al.,* 2017; Kamel Boulos *et al.,* 2019; Almagrabi and Al-Otaibi, 2020; Munjal *et al.,* 2020; Caputo *et al.,* 2024). Smart cities, whose main objective is to enhance the quality of life in the urban environment by incorporating advanced and sustainable technologies (Bajdor *et al.,* 2021), can be considered a reasonable basis for developing smart healthcare. According to the Health and Welfare Plan (Trencher and Karvonen, 2017), the integration of digital innovation into the healthcare systems of urban areas can bring about the following advantages: shorter hospital stays, improved quality of care, and less expenditure by healthcare facilities (Guha and Kumar, 2017). The digital transformation in healthcare systems is not only about increasing efficiency. It enhances organizational effectiveness, accountability, information exchange and the ability of systems to recover from adversity (Zhang *et al.,* 2017; Anjum *et al.,* 2018; Rath and Pattanayak, 2018; Alahmari *et al.,* 2022). Digital tools help in preventing clinical bottlenecks and reducing adverse outcomes, and create healthcare systems that are economically and socially sustainable (Petrucco and Ferranti, 2017; Dritsa and Biloria, 2018; Moore and Pham, 2019; Zhuang *et al.,* 2020; Zhang *et al.,* 2021; Ramu *et al.,* 2022). Therefore, in this shifting paradigm, the idea of smart citizens is born, highlighting citizens' role in engaging with and benefiting from health technologies. According to Javed et al. (Javed *et al.,* 2022), IoT-based nanotechnologies in medical care are a key driver of the future of urban health, making once-unthinkable procedures possible in a clinical setting. Hence, smart healthcare intends to use these technologies to improve the quality of healthcare services, patients' welfare, and quality of life (Chauhan *et al.,* 2021). According to Singh and Kaur (Singh and Kaur, 2020), digitization is no longer a choice; it is a must for the future of healthcare systems. Digital transformation in medical care received a push from the COVID-19 pandemic which revealed the significance of technological tools in crisis management (Papa *et al.,* 2020; Ashraf *et al.,* 2021; Azzaoui *et al.,* 2021; Gavurova *et al.,* 2022; Gagliardi and Tomaselli, 2025). For instance, Azzaoui *et al.* (Azzaoui *et al.*, 2021) showed the effectiveness of infodemiology in outbreak detection with a seven-day advance warning. Also, Rahman et al. (2020) proposed deep learning-based systems for monitoring public health behaviour using CCTV to identify individuals without masks. Big data in healthcare has now become critical not only for the enhancement of daily operations but also for the prevention of future pandemics (Pramanik *et al.,* 2017; Muhammed *et al*., 2018). As Alzawamri et al. (Alzawamri *et al.,* 2022) pointed out, a city is considered smart only when its health systems are deliberately created to improve the standard of living. However, the efficient use of smart healthcare technologies is not only a matter of technical implementation but also the acceptance and trust of patients and professionals. Privacy issues and resistance to change are still major obstacles. This is why it is crucial to address the cultural and operational gaps to foster trust and inclusive participation. This study seeks to address this gap by presenting a bibliometric review of the literature on smart healthcare in urban settings. This paper identifies the key theoretical and managerial implications based on identifying the main research areas and analyzing the emerging trends. It proposes directions for further research and policy.

2. Methods

Utilizing the structured literature review (SLR) research methods, this study explores and identifies the key research areas (RAs) that have an impact on smart healthcare while identifying current and future trends, new insights, and promising avenues for further research (Tranfield et al., 2003; Petticrew, 2006; Massaro *et al.,* 2016; Centobelli *et al*., 2017; Kraus *et al.,* 2020).

According to Secundo et al. (Secundo *et al.,* 2021), performing an SLR involves the following phases:

- Define the research questions;
- Develop a research protocol
- Identify the papers for analysis;
- Create a coding framework;
- Conduct a critical analysis and discussion, identifying future research opportunities and avenues.

An SLR begins with formulating research questions that aim to characterize the scientific literature's changing nature, emphasis, and implications over time [38]. The following research questions guide this study:

RQ1: How is smart healthcare literature evolving, and what factors influence its strong adoption of digitization?
RQ2: What are the primary areas of inquiry in the academic literature that examines digitization for smart healthcare?
RQ3: What conclusions can be drawn for future research?

Additionally, a protocol has been established for selecting articles and conducting data searches. After determining which databases were the most comprehensive in their respective fields of study, those that gathered information on socio-economic issues were prioritized. The articles were found in the scientific database Scopus, which is bigger than the Web-of-Science database (WoS) (Thelwall, 2018) and offers more thorough coverage of academic journals. Scopus includes over 20,000 peer-reviewed journals (Mishra *et al.,* 2017). Moreover, nearly all of the documents listed by WoS are present in Scopus (97%) (Waltman, 2016). Consequently, Scopus is a suitable resource for structured literature reviews.

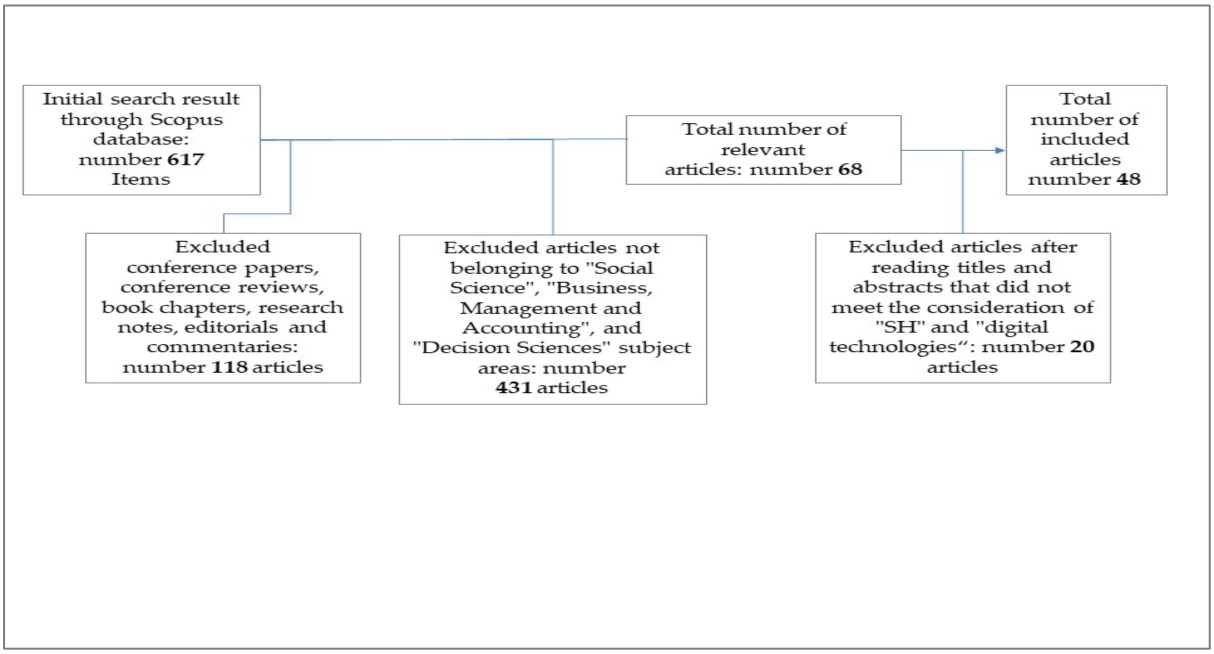
We employed the PRISMA flowchart (Moher *et al.,* 2009) to identify the final set of articles to be worked on. PRISMA is used to evaluate four phases:

- Identification – records search in the identified database;

- Screening - eliminate duplicates by reading the title and abstract (Secundo *et al.*, 2021);
- Eligibility – full-text reading;
- Inclusion: records to be processed using analysis.

Using the following query syntax, the fields "Title" or "Keywords" or "Abstract" or "Authors" concerning the survey perimeter were examined: "smart city" AND" smart healthcare" and related terms in peer-reviewed journals (Keupp *et al.,* 2012) this does not include conference papers, book chapters, research notes, editorials, or commentaries. It is best only to consider documents that contain knowledge that has been empirically validated (Podsakoff *et al.,* 2005). Reproducible, comprehensive, and unbiased search criteria are provided.

Figure 1: Data selection process flow. 'Authors' elaboration as a source.



First, 617 documents were found, with the first appearing in 2016 and the last appearing today. In December 2024, data were gathered. Two researchers were responsible for reading the articles' titles and abstracts and selecting those appropriate for further analysis. The following procedures have been followed in order to choose the items:

- 617 documents were discovered by searching the Scopus database using the query mentioned above;
- 118 documents were disregarded because they were not published in a journal and were not in English (617-118=499);
- 431 documents were excluded because they were not pertinent to the Business Administration and Accounting sectors (499 minus 431 equals 68);
- 20 documents were eliminated after titles and abstracts were scrutinized because they merely used the terms "smart healthcare" and "digital technologies" in isolation (hence, 68-20=48);
- In line with the research focus, 48 documents were ultimately found.

Figure 1 summarizes how the data collection process works based on the plan proposed by Vlaanderen et al. (Vlaanderen *et al.,* 2018). Included in the data set are case studies, empirical research, and qualitative and quantitative studies, all of which have been utilised for bibliometric analysis's descriptive and content analysis applications.

The 48 chosen documents were both subject to descriptive analysis and cluster analysis. The descriptive analysis highlights specific aspects of a publication, such as the number of articles published over time (Dumay, 2014). The number of citations and citations per year (CPY) were also compared to estimate each article's impact.

After encoding, the data were analyzed with VOSviewer, a program for constructing and displaying bibliometric networks and clusters (Van Eck *et al.,* 2014).

VOSviewer, a program for creating and displaying bibliometric networks and clusters, was used to interpret the data (Del Giudice *et al*., 2021; Behl *et al.,* 2022; Luo *et al.,* 2022; Gagliardi *et al.,* 2023). Researchers can use VOSviewer to group articles together and determine how they relate to each other through bibliographic matching, co-citation, and keyword co-occurrence analyses. Due to its focus on graphic maps, the authors used the VOSviewer software to evaluate the bibliographic coupling (Castillo-Vergara *et al.,* 2018). When two other articles cite an article (Li *et al.,* 2017), a technique known as bibliographic coupling evaluates the relationship between the articles in the sample (Kessler, 1963) this method evaluates the literature that overlaps the articles. A third party citing two different sources is known as a co-citation. If a keyword group appears in at least two documents, it co-occurs. According to Van Eck and Waltman (Waltman *et al.,* 2010) the clustering approach is suitable for bibliometric analysis by VOSviewer developers. The clustering procedure (Kessler, 1963) begins with considering the distances between nodes; consequently, groups are determined by minimizing these distances. All analyses carried out with VOSviewer use fractional counting (Leydesdorff and Opthof, 2010).

Lastly, content analysis has provided an overview of emerging RAs, research gaps, and future directions. The subsequent paragraph introduces and explains the key findings.

2.1 Research Framing within Management Studies

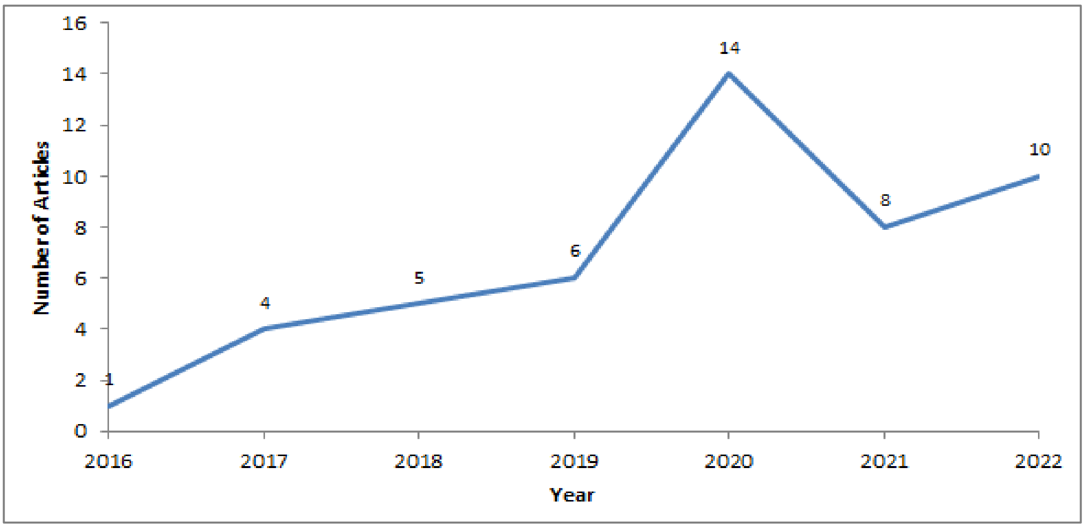
To better contextualize this study within the management literature, the research draws upon three theoretical domains: (1) digital transformation management, (2) healthcare operations and logistics, and (3) organizational change and innovation management. Implementing innovative technologies within urban healthcare systems is not solely a technological shift but a deep organizational transformation. This process demands integrated strategies in change management, capacity building, and human capital development. This bibliometric review identifies a clear need for interdisciplinary frameworks incorporating operations research, innovation strategy, and healthcare management to maximize the impact of smart city initiatives in healthcare.

3. Findings

3.1 Evolution in time, top journals and authors

Looking at the publication dates in Figure 2, the topic under discussion seems relatively new. Interest in this field of study has risen since 2016, but the topic is still in its infancy. Research interest has increased since 2019, with more pronounced growth over time. This renewed focus on smart healthcare can be traced to the growing recognition of its importance in clinical governance and the scientific community.

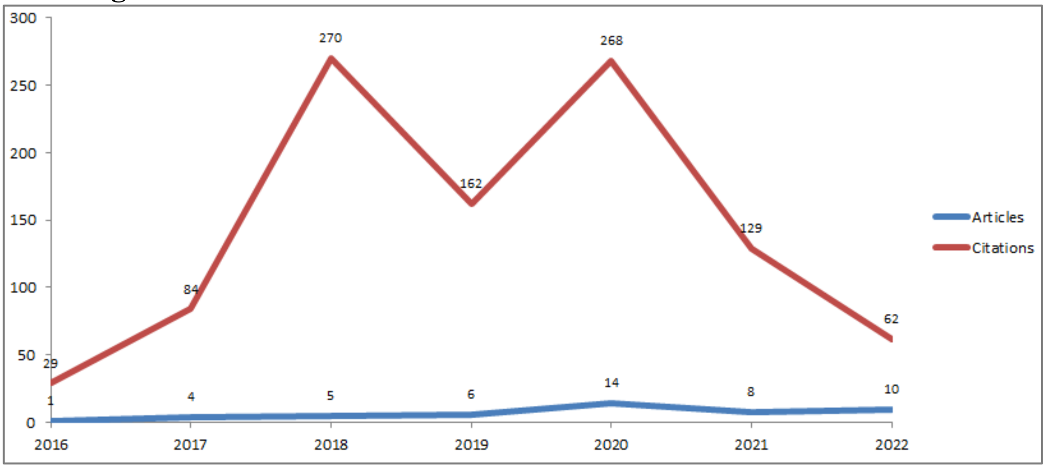
Figure 2: Time-trend of research publications in the field.



Authors' elaboration as a source.

Figure 3 shows a steady increase in the number of articles published and the citations they received over the next three years. This further demonstrates the scientific community's current fixation on smart healthcare.

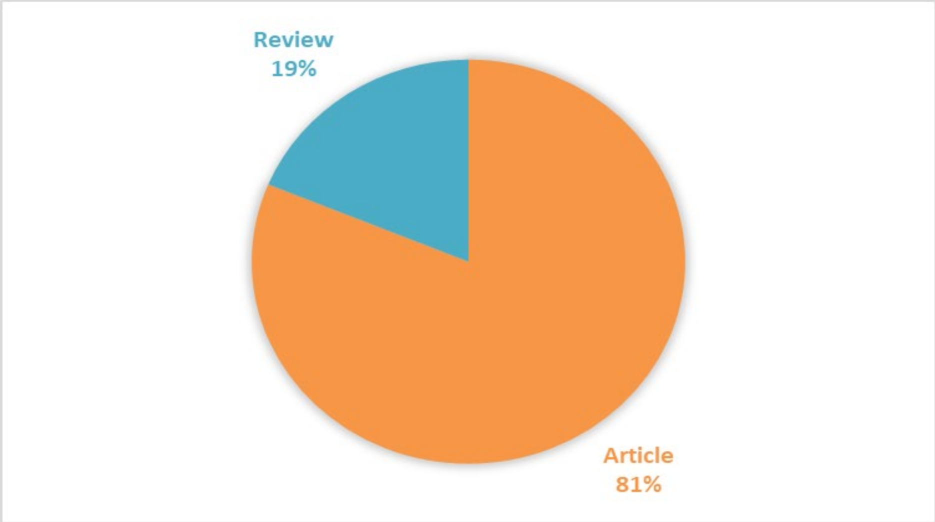
Figure 3: Citations to articles versus the total number of articles.



Authors' elaboration as a source.

As depicted in Figure 4, 81 % are exploratory articles about health and smart cities, indicating the scientific community's keen interest in this study area.

Figure 4: The types of documents published from 2016 to 2024.



Authors' elaboration as a source.

According to the number of scientific articles in the survey, Table 1 shows the top 15 scientific journals. The number of articles published (2) and citations (160) for the Inter-national Journal of Health Geography are the highest of any journal in the survey.

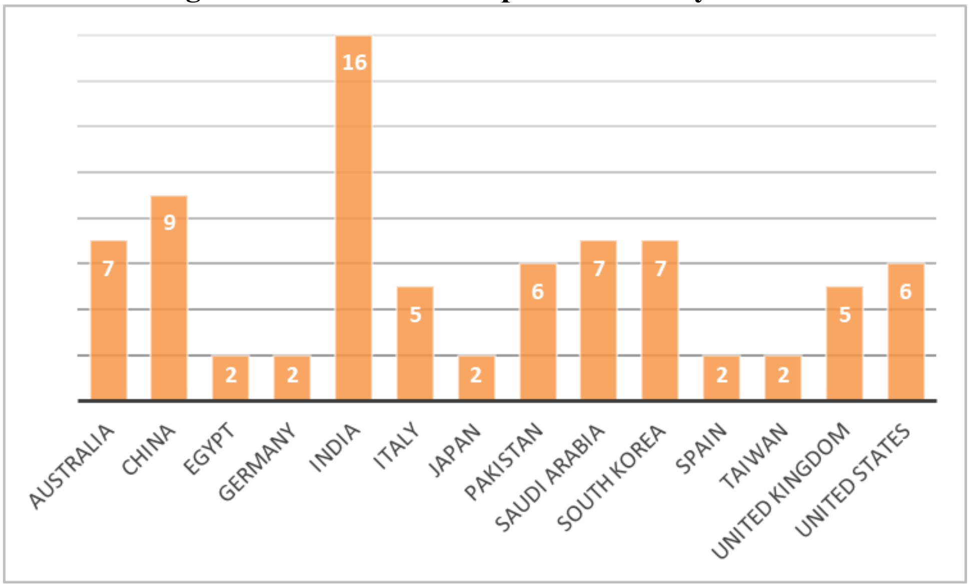
Table 1: The top 15 journals by the number of records (articles or citations).

Journal	Articles	Citations
International Journal of Health Geographics	2	160
Sustainability (Switzerland)	8	125
Technological Forecasting and Social Change	1	115
Sustainable Cities and Society	9	106
Production and Operations Management	1	101
Local Environment	1	59
Journal of Cleaner Production	1	56
IET Smart Cities	1	40
International Journal of Human Rights in Healthcare	1	32
Information Security Journal	1	29
IEEE Transactions on Big Data	1	22
Personal and Ubiquitous Computing	1	20
Cities	1	16
Global Transitions	1	15
International Journal on Emerging Technologies	1	12

Authors' elaboration as a source.

In addition, an evaluation of the results for each country in terms of the number of documents published (Figure 5) was conducted, taking into account the countries with at least two published manuscripts. India and China are the nations with the greatest number of publications (16 and 9 articles, respectively), followed by Australia, Saudi Arabia, and South Korea (7).

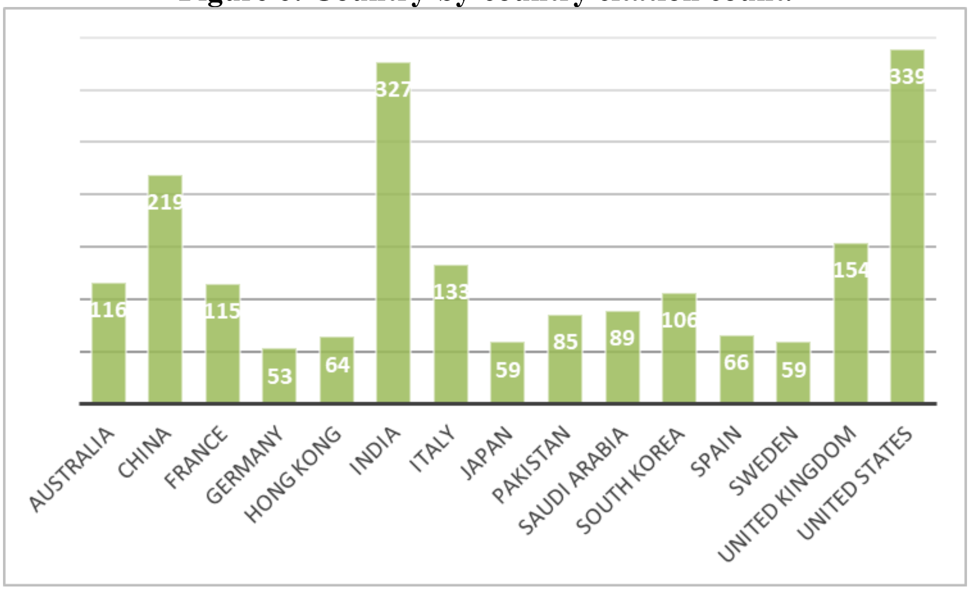
Figure 5: The number of publications by nation.



Authors' elaboration as a source.

Figure 6 depicts the analysis of countries with the highest level of citations, considering only countries with at least 50 citations. This explanation partially reflects the analysis of Figure 5; the United States ranks first (339 citations), followed by India and China (327 and 219 citations, respectively).

Figure 6: Country-by-country citation count.



Authors' elaboration as a source.

The authors of the first ten articles are listed in Table 2 and are categorised according to the number of documents they have contributed. The article by Papa et al. (Papa *et al.,* 2020) is the most cited overall and the most cited by year according to the Citations Per Year (CPY) metric, which measures the scientific influence on the academic community.

Table 2: Citation Per Year (CPY) organises the most-cited authors and articles.

Authors	Title	Year	Source title	Cited by	CPY	Ranking CPY
Kamel Boulos M.N., Wilson J.T., Clauson K.A.	Geospatial blockchain: Promises, challenges, and scenarios in health and healthcare	2018	International Journal of Health Geographics	160	40	3
Papa A., Mital M., Pisano P. & Del Giudice M.,	E-health and well-being monitoring using smart healthcare devices: An empirical investigation	2020	Technological Forecasting and Social Change	115	57.5	1
Guha S. & Kumar S.,	Emergence of Big Data Research in Operations Management, Information Systems, and Healthcare: Past Contributions and Future Roadmap	2018	Production and Operations Management	101	25.25	4
Chui K.T., Alhalabi W., Pang S.S.H., de Pablos P.O., Liu R.W. & Zhao M.,	Disease diagnosis in smart healthcare: Innovation, technologies and applications	2017	Sustainability (Switzerland)	64	12.8	9
Trencher G. & Karvonen A.,	Stretching "smart": advancing health and well-being through the smart city agenda	2019	Local Environment	59	19.67	6
Chauhan A., Jakhar S.K. & Chauhan C.,	The interplay of circular economy with industry 4.0 enabled smart city drivers of healthcare waste disposal	2021	Journal of Cleaner Production	56	56	2
Kamel Boulos M.N., Peng G. & Vopham T.,	An overview of GeoAI applications in health and healthcare	2019	International Journal of Health Geographics	45	15	8
Xu B., Li L., Hu D., Wu B., Ye C. & Cai H.,	Healthcare data analysis system for regional medical union in smart city	2018	Journal of Management Analytics	42	10.5	10
Jaiswal R., Agarwal A. & Negi R.,	Smart solution for reducing the COVID-19 risk using smart city technology	2020	IET Smart Cities	40	20	5
Qureshi K.N., Tayyab M.Q., Rehman S.U. & Jeon G.,	An interference aware energy efficient data transmission approach for smart cities healthcare systems	2020	Sustainable Cities and Society	33	16.5	7

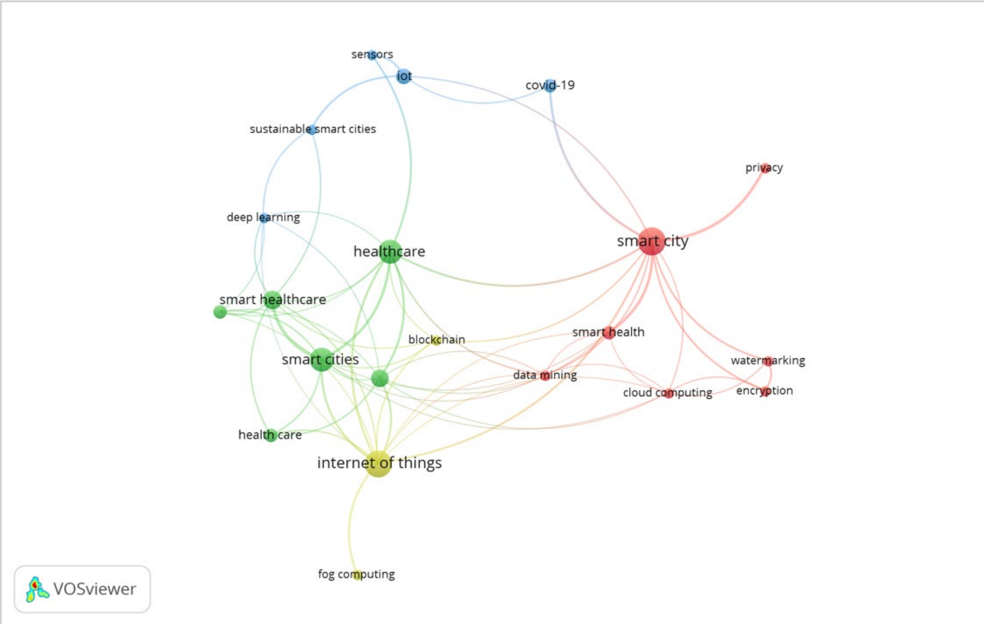
Authors' elaboration as a source.

3.2 Keyword Occurrence Analysis

The authors examined the co-occurrence of keywords in published works. VOSVIEWER was then used to process the data acquired from the Scopus database, upon which the bibliometric analysis was conducted. The search results

were then imported into a CSV file. The minimum number of keyword occurrences has been set to 2, resulting in a total of 21 keywords.
The collection consisted of 4 clusters. The largest contains 7 elements, the second collection consists of 6 components, the third consists of 5 elements, and the fourth consists of 3 elements (Figure 7).

Figure 7: Author's keyword network map.



Authors' elaboration as a source.

This map highlights the words most often used in article titles. Due to their inclusion in our survey, the terms "smart city," "healthcare," and "internet of things" are shown as the most significant keywords in Figure 7.

3.3 Content analysis: research areas

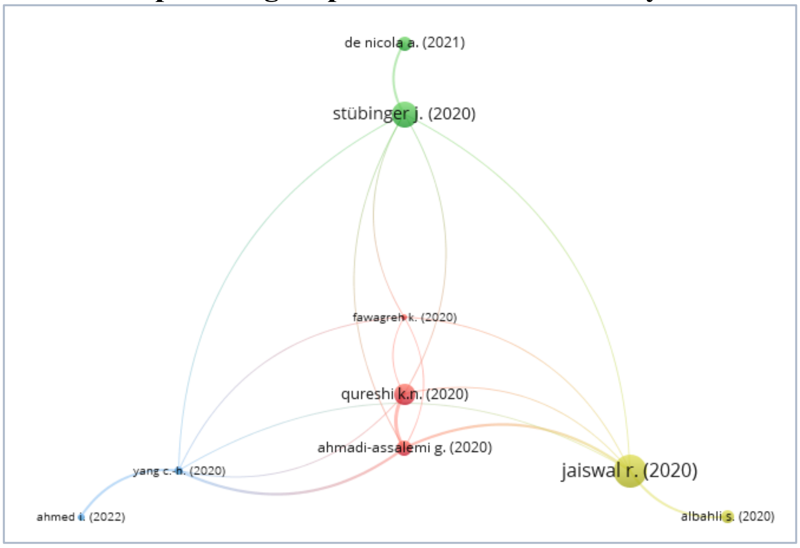
The key issues linking digital technologies to smart healthcare were discovered using the bibliographic mapping method as part of the bibliometric analysis process. Essential publications can be mined for information using this methodology (Börner *et al.,* 2005; Mital *et al.,* 2018). This kind of analysis has two benefits: first, it enables academics to focus their research on less explored or more popular subjects, and second, it gives business executives a thorough and easier-to-understand state of the art for quickly putting theoretical knowledge into good practice. The number of common citations between two articles is a one-way bibliographic coupling method used to infer their relationship (Boyack and Klavans, 2010). Since at least one citation is required for the software to treat the documents as an analysis unit, VOSviewer has been used for the bibliographic coupling analysis. This investigation yielded four groups and nine documents.
Table 3 and Figure 8 show the results of bibliometric grouping, which led to the identification of RAs through manual reading by two researchers. After reviewing the literature, researchers settled on three key RAs.

Table 3: Groupings resulting from the bibliometric coupling.

	Authors	Citations	Title
Cluster 1 (3 Items – red)	Ahmadi-Assalemi G. *et al.* (2020)	9	Cyber resilience and incident response in smart cities: A systematic literature review
	Fawagreh K. and Gaber M.M. (2020)	1	Egap: An evolutionary game theoretic approach to random forest pruning
	Qureshi K.N.*et al.* (2020)	17	An interference aware energy efficient data transmission approach for smart cities healthcare systems
Cluster 2 (2 Items - green)	De Nicola A. and Villani M.L. (2021)	8	Smart city ontologies and their applications: A systematic literature review
	Stübinger J. and Schneider L. (2020)	24	Understanding smart city—a data-driven literature review
Cluster 3 (2 Items - blue)	Ahmed I. *et al.* (2022)	2	Internet of health things driven deep learning-based system for non-invasive patient discomfort detection using time frame rules and pairwise keypoints distance feature
	Yang C.-H. *et al.* (2020)	3	Sustainable smart healthcare information portfolio strategy evaluation: An integrated activity-based costing decision model
Cluster 4 (2 Items - yellow)	Albahli S. *et al.* (2020)	6	A blockchain-based architecture for smart healthcare system: A case study of Saudi Arabia
	Jaiswal R. *et al.* (2020)	40	Smart solution for reducing the COVID-19 risk using smart city technology

Authors' elaboration as a source.

Figure 8: Clusters represent groups of elements shared by relevant literature.



Authors' elaboration as a source.

RA 1: smart cities for health safety

At this point in the discussion, "smart cities as a way to improve health safety" stands out as the most pertinent area of expertise. Quantitative and qualitative contributions were both identified, emphasising information technology resources for protecting the confidentiality of patient records. One such topic is the widespread use of blockchain technology. As Albahli et al. (Albahli *et al.,* 2020) pointed out, blockchain technology can be implemented in the healthcare sector to safeguard against potential threats and strengthen clinical procedures.

In addition, Amit and Singh (Amit and Singh, 2021) proposed a secure watermarking algorithm for facilitating cloud-based clinical record sharing among healthcare professionals. Because of this system, outsourcing medical data for clinical diagnosis became possible without compromising 'patients' personal information.

Additional research appears to be of great interest because it summarises the current state of cyber threats. Cyber resilience and digital forensic incident response (DFIR) are two critical aspects of cyber-physical systems (CPS) in smart cities, and Ahmadi- Ahmadi-Assalemi et al. (Ahmadi-Assalemi *et al.,* 2020) conducted a systematic review of the literature to analyse empirical studies on these topics. The results of their literature review show that there have been studies addressing smart healthcare and smart citizens, but they also reveal substantial gaps in the literature that could be used to guide future directions in cybersecurity research.

The use of smartphones by doctors and patients to control and monitor implantable medical devices via the Internet or Bluetooth connections is increasing. Hassija et al. (Hassija *et al.,* 2021) have outlined some practical security measures to improve patient safety and privacy.

Kamel Boulos et al. (Kamel Boulos *et al*., 2018) published an editorial reiterating the significance of blockchain technology in healthcare for several reasons, including safeguarding stakeholders' privacy and identifying instances of medical fraud. Furthermore, they alluded to developing geospatial blockchain solutions to reveal the distribution of currently deployed blockchain applications. This innovation has allowed for an accurate spatial and temporal tracing of occurrences to date.

RA 2: smart cities for health data sharing

The research demonstrating smart healthcare's value in exchanging health information is gathered here. Fawagreh et al. (Fawagreh *et al.,* 2020) and Quereshi et al. (Quereshi *et al.,* 2020) have written the two most important articles on this second viewpoint. In order to quantify the impact of digital technologies on healthcare organizations, both studies propose a system based on the exchange of clinical data. Specifically, they carry out an accurate predictive analysis of health data using suitable computer protocols, leading to improved disease diagnosis, treatment, and outcomes and, ultimately, a longer, healthier life for patients.

Ahmed et al. (Ahmed *et al.,* 2022) describe a system for non-invasively detecting patient discomfort using deep learning powered by the Internet of Health Things. One example of this innovation is using an RGB camera instead of sensors and wearable devices to transmit clinical data with high accuracy. To address the poor coordination of care between facilities, Xu et al. (Xu *et al.,* 2018) proposed a data analysis system for the Regional 'Doctors' Union in 2018.

RA 3: Smart cities for developing healthcare skills

The authors emphasize the significance of smart city realities and, by extension, smart healthcare in the social context in the latter RA, which describes the transfer of knowledge and, as a result, the creation of skills.

The "smart healthcare sector" needs to "optimize its innovative health information strategies, creating value from process activity, and reducing the cost of healthcare without sacrificing the quality of patient care", as stated by Yang et al. (Yang *et al.,* 2020). In order to better understand how to allocate resources and plan for the future based on the actual costs associated with various activities, they employ a decision-making model based on activity-based costing and decision-making techniques to improve clinical governance. Stubinger et al. (Stubinger *et al.,* 2020) and De Nicola et al. (De Nicola *et al.,* 2020) outline how the smart city is currently understood, what technologies have shaped his idea, and what the challenges for further development are through two systematic reviews of the literature that take a holistic approach. In their research, Jaiswal et al. (Jaiswal *et al.,* 2020) explain how digital technologies can mitigate the danger posed by COVID-19. According to SARS-Cov-2, one of the many benefits these technologies have brought to clinical staff during the pandemic is the optimization of social distance rather than the refinement of the detection of infected people.

Table 4 presents each RA's thematic focus, together with representative references and primary theoretical and practical insights derived from the literature.

Table 4: Summary of the three main RAs identified through content analysis.

	Research Area	Key References	Main Insights
1	RA1: Smart cities for health safety	Albahli et al. (2020); Ahmadi-Assalemi et al. (2020); Hassija et al. (2021); Amit and Singh (2021); Kamel Boulos et al. (2018)	Emphasis on cybersecurity, blockchain, and privacy-preserving technologies to protect patient data and support clinical safety.
2	RA2: Smart cities for health data sharing	Qureshi et al. (2020); Ahmed et al. (2022); Fawagreh and Gaber (2020); Xu et al. (2018)	Use of AI, IoT, and data transmission systems to enhance diagnostics, treatment efficiency, and inter-organizational coordination.
3	RA3: Smart cities for developing healthcare skills	Yang et al. (2020); Jaiswal et al. (2020); De Nicola and Villani (2020); Stübinger and Schneider (2020)	Focus on cost-efficiency, digital skills development, and innovation in healthcare delivery processes within smart city ecosystems.

Authors' elaboration as a source.

4. Managerial and Policy Implications

The research findings from this bibliometric review guide managers and policymakers in establishing essential priorities for their strategic investments. Healthcare managers who work in urban smart ecosystems need to direct their resources toward digital infrastructure development for health data sharing and patient-centred technologies and cybersecurity measures. The efficient deployment of digital platforms enables better healthcare service delivery which leads to improved patient results, particularly in highly populated urban areas. The successful implementation of AI, IoT and blockchain technologies demands organizations to implement accompanying change management strategies. Healthcare organizations should develop ongoing professional development programs which focus on building digital competencies for their healthcare staff and administrative workforce. The long-term success of smart healthcare programs depends on developing digital competencies that extend throughout all organizational levels. Urban policymakers need to merge healthcare priorities with smart city initiatives by establishing governance models which unite urban planning with public health and digital innovation. A crucial aspect of these governance models is establishing regulatory systems that effectively resolve issues regarding data interoperability while simultaneously protecting privacy and addressing ethical matters in health data management. Smart healthcare requires collaborative governance together with inter-institutional coordination to become a fundamental component of city-wide digital transformation strategies. Smart healthcare requires an organizational transformation beyond technological advancement because of its comprehensive nature. Blockchain technology enables secure medical record sharing between different departments while fighting medical fraud. AI diagnostic systems installed in urban hospitals use optimization algorithms to improve emergency department operations and enhance the precision of initial patient evaluations. The practical applications of smart healthcare technologies demonstrate how targeted investments produce quantifiable enhancements in operational efficiency and clinical quality. Through these innovations, managers can reduce costs while improving patient satisfaction and institutional resilience.

5. Limitations

This research delivers essential knowledge about smart healthcare development in urban settings although several research limitations affect both generalizability and interpretation of results. This study's bibliometric and content analysis relied solely on Scopus-indexed articles from 2016 through 2024. The reliance on Scopus for this study resulted in excluding academic publications on Web of Science, PubMed, and Google Scholar because they represent the most recognized databases for peer-reviewed literature in bibliometric studies. The analysis fails to include crucial grey literature comprising technical reports, policy briefs, and institutional white papers containing practical information about emerging trends that have not been documented in academic publications. The English-only language restriction during the selection process resulted in the exclusion of essential research that appeared in languages other than English because smart city and healthcare innovation operate globally. A future review should employ multilingual search methods to collect diverse international research perspectives. Researchers must conduct subjective interpretation during the process of identifying and classifying RAs because this work relies on both systematic content analysis and bibliometric coupling. The researchers implemented independent coding and collaborative discussion to achieve transparency, but thematic nuances remained either oversimplified or undetected. This research depends solely on academic sources and fails to validate findings through field-based data obtained from interviews and case studies as well as participatory observation. Managerial implications derived from literature analysis would gain strength by adding real-world data obtained from healthcare organizations and urban governance sites. Technological advancements in smart healthcare move so swiftly that bibliometric snapshots lose their relevance in a short period of time. Future research updates of this analysis will be needed to monitor the development of new technologies, policy developments, and public acceptance patterns over time. The study establishes a solid academic understanding of smart healthcare, yet future research needs to validate these findings using interdisciplinary methods, empirical data, and context-specific approaches.

6. Conclusion and Future Research Directions

This paper provides an extensive examination of smart healthcare literature through both bibliometric analysis and content analysis focused on urban settings. The research identifies three main research areas within smart cities for health safety and smart cities for health data sharing and smart cities for healthcare skills development to provide an organized overview of present-day knowledge.

The research demonstrates that academic interest in this field continues to grow but the existing literature remains scattered without a single unifying theoretical or operational framework. The study identifies three managerial implications which require specific investment strategies organizational transformation plans, and integrated urban governance approaches. The research paper establishes research directions to direct upcoming studies and policy development.
The implementation of smart healthcare requires both technological adoption and institutional change and workforce preparedness and citizen participation. The successful deployment of smart healthcare requires healthcare managers to work together with policymakers and researchers through coordinated actions to address this systemic and interdisciplinary challenge. The research helps progress both theoretical and practical and strategic discussions about healthcare digital transformation in smart city environments.
Multiple research areas need additional exploration to enhance smart healthcare implementation within urban environments, as identified through bibliometric and content analysis results.
The implementation and evolution of smart healthcare solutions require empirical studies which follow different cities and countries through time to measure long-term outcomes and contextual variations. The evaluation of smart healthcare technologies requires research to assess their operational performance together with their clinical effects and economic impact. The evaluation should include metrics that measure cost-effectiveness alongside health outcomes and patient satisfaction and system efficiency.
Prospective investigations should create and validate multi-criteria decision models to help public and private investors make informed choices regarding digital health infrastructure investments at the urban level. Upcoming studies need to focus on participatory design and co-creation practices, which include citizens and patients in smart health system planning and adoption to achieve inclusive access and build trust among users. Future research directions will help develop evidence-based management-oriented approaches for digital transformation in urban healthcare systems which balance efficiency with social impact.

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