Multidisciplinary Research Journal
ISSN (online): 3108 – 1533

Volume 2, Issue 2, 2026
April – June 2026

Case Study

Scoping View of Healthcare Software Development: A Use Case of Automated Literature Review Platform ResearchRover

Bishnu Shankar Satapathy[1,*], Subrojyoti Paul [2], Polycarp Basumatary [2], Pinju Saikia[2], Madhusmita Dash [3], Siddhartha Sankar Satapathy [2,*]

[1] Center for Multidisciplinary Research, Tezpur University, Napaam, Assam, India INDIA- 784028
[2] Department of Computer Science and Engineering, Tezpur University, Assam, INDIA- 784028
[3] Department of Electronics and Communication Engineering, NIT, Jote, Arunachal Pradesh, INDIA - 791113
* Correspondence: BSS: bishnu.satapathy@gmail.com ; SSS: ssankar@tezu.ernet.in

Scopus Author ID 58798760100
Received: 25 May 2026; Accepted: 29 July 2026; Published: 15 October 2026

Abstract: Academic literature available in large scale online databases presents both opportunities as well as challenges to modern researchers. In this scenario, we are developing a software with name ResearchRover that would provide a platform to researchers for automated literature review of these large scale online articles using advancement in AI/ML. At present this software is available in the form of a prototype. It allows researchers to search and download articles on a specific topic of interest and create a local database of the articles and associated metadata. Based on the local database content, the platform provides integrated search, and metadata aggregation utilities. The ResearchRover program is available in GitHub portal at https://github.com/Poly-777/Research_Rover along with associated documents for researchers. This automated platform for research literature review process will help in bridge the gap in research comprehension and analysis, offering a solution that moves beyond traditional scholarly search capabilities. The system architecture and detailed algorithms of the ResearchRover software are available elsewhere whereas key features are presented to have a scoping view on the current research scenario on smart healthcare software development process in this article. Large language model-based research trend analysis of the article metadata revealed growth, success stories and challenges in healthcare software industry across the globe.

Keywords: Research Literature Review; Automation; Large Language Model; AI/ML; Natural Language Processing

1. Introduction

Literature review is a fundamental component of the research process, as it enables researchers to understand the current state of knowledge related to a specific problem area. Through the examination of previously published studies, researchers can identify established findings, unresolved issues, methodological limitations, and emerging research directions [1–2]. A literature review helps researchers define research objectives, identify suitable variables, and justify the methods used in a study. It is often the first step in research because it allows scholars to understand existing theories, important studies, and current developments in a subject area. Literature reviews can be presented in different forms, like Such as standalone review papers and introductory sections of research articles. they can also be classified as separate chapters in dissertations and technical reports. In addition to summarising previous

studies, a good literature review compares and evaluates earlier findings from previous research to create a strong foundation for future research.

In recent years, the number of published research articles has increased significantly. This has made it difficult for researchers to handle and study large amounts of scientific information manually [3–4]. Reports show that the Scopus database included more than 90 million publications by 2023, out of which more than 20 million were available as open-access articles. Large publication houses like Elsevier, Springer, Wiley, MDPI, and Frontiers have played a major role in this growth since 2016 [5]. To maintain scientific integrity, it is essential to give proper citations to earlier research. Recognising prior contributions and supporting cumulative knowledge development within the research community create a structured environment for the researchers. However, conducting a systematic and timely literature review has become increasingly challenging due to the rapid growth of publications across digital databases.

Due to this rapid surge in manuscript publications, researchers now need automated and intelligent tools to support literature review and knowledge discovery activities more effectively. Relevant studies are sometimes overlooked because of limited awareness of prior work, parallel development of similar ideas, or inadequate review practices [6]. Missing citations can reduce recognition for original contributors, obscure the evolution of ideas, and result in duplication or inconsistency in scientific understanding. To ease the review process, publishers often maintain search engines to suggest relevant articles on the topic of interest. However, the process of identifying, organising, and critically analysing relevant literature across all publishers remains time-consuming and cognitively demanding. Existing academic search engines such as Google Scholar, Semantic Scholar, or PubMed provide access to vast repositories of research papers, they typically do not facilitate contextual interaction, content-level understanding, or integrated synthesis of findings. These tools offer limited mechanisms for personalised exploration, or metadata curations.

In general, the collection, extraction, and synthesising of the required data for systematic reviews are highly manual, error-prone, labour-intensive, and often do not provide a global view of any field of scientific research. This article presents an AI-augmented literature review platform prototype called ResearchRover that facilitates the academic literature exploration process through integrated search and, metadata aggregation. We believe that this platform would enhance access to available online information and help interpret, synthesize, and evaluate that information critically, for a high-quality literature review.

1.1. Related Work

Literature surveys are usually an informal, preliminary, and descriptive exploration of existing studies primarily conducted by individual researchers as methodology. With a higher level of methodological rigour, the scoping review provides an overview of a research area following a formal, structured, and transparent evidence synthesis method. According to frameworks developed by Hilary Arksey and Lisa O'Malley [7] and later refined in methodological guidance by Peters and co-researchers [8], a scoping review follows explicit steps such as clearly defined research questions, systematic and reproducible search strategies, transparent inclusion/exclusion criteria, and structured data charting and synthesis. The scoping review framework clearly highlights the requirement of the defined research questions. It also defines a structured study selection process involving multiple reviewers [9]. Over the period,

research reporting standards such as the PRISMA Extension for Scoping Reviews (PRISMA-ScR) have also improved the consistency and transparency of the scoping reviews principles [10].

Scoping review principles are useful in an emerging research area where available testimony is varied and not yet appropriate for detailed meta-analysis. The clearly framed research question, and well defined scoping review principles help researchers explore the breadth of available literature across multiple databases [11]. Researchers select the predefined inclusion and exclusion criteria to maintain consistency throughout the review process. Relevant information from the selected studies is organised and summarised by researchers using descriptive analysis and thematic grouping to identify research trends, existing gaps, and possible future directions. Such an approach was adopted by Bhutani and colleagues in their study on screen time usage [12].

With the Fourth Industrial Revolution 4.0 and 5.0, several software tools have been developed to improve keyword-based article retrieval. As the selection of search terms often depends on a researcher's familiarity with the subject area, it can sometimes limit the diversity and relevance of retrieved studies. Guerra and colleagues proposed a system that combines metadata and semantic information to transform search keywords into SQL (Structured Query Language) queries for structured data sources [13]. The methodology improves traditional keyword searching. However, generating accurate SQL queries for complex relationships among multiple data elements is challenging. In recent years, AI- and machine learning-based tools have also been introduced to support literature review activities by assisting researchers in searching, organising, and analysing scholarly articles with reduced manual effort.

The semantic web based method reported to outperforms keyword-based search engines in retrieving relevant results by interpreting the semantic meaning of a query rather than relying only on exact keyword matches [14]. As reported by Sarica and co-researchers, a semantic engineering knowledge graph (EKG) trained on the full patent database using NLP automated and augmented the traditionally heuristic and iterative process of keyword discovery [15]. This EKG serves as the foundation to retrieve and rank keywords from retrieved patents matching those keywords based on the title and abstract of the research articles. Recently, several platforms have emerged to support different stages of automated literature review. OpenResearcher is an AI-powered Retrieval-Augmented Generation (RAG) with an LLM-based platform designed to answer diverse research questions by combining real-time information retrieval with generative reasoning over scientific literature [16]. Instead of considering comprehensive thoroughly peer reviewed article databases such as PubMed, Scopus, or Web of Science, the original implementation of OpenResearcher uses the arXiv corpus. Another tool ResearchRabbit available at https://www.researchrabbit.ai/ facilitates AI-assisted exploration as used for scoping reviews [17-18]. ResearchRabbit is designed primarily for literature discovery through citation and authorship networks, using interactive maps to identify related, influential, and emerging research. Litmaps (https://docs.litmaps.com) is another automation tool for citation-network-based discovery and visualisation that allows researchers to explore relationships among papers and identify relevant literature through customisable search algorithms. Elicit (https://elicit.com) is another such tool for literature search, screening, full-text data extraction, and evidence synthesis, with extracted information linked to supporting evidence from the source articles.

However, many of such tools lack a fully integrated system to facilitate researchers to search, filter, analyse, and directly interact with curated content in a seamless manner. AI/ML based tools, still in the preliminary stage, often hallucinate when retrieving scientific knowledge and therefore need proper reference on any conclusion drawn on any research topic. The ResearchRover platform is designed as an integrated research-literature corpus management and analysis framework, in which articles retrieved from public scholarly databases are downloaded and maintained in a local database, followed by keyword/content-based analysis and AI-assisted question answering over the researcher-defined corpus. Therefore, the ResearchRover platform focuses on researcher-controlled corpus construction, local/persistent article storage, computational analysis, and evidence-grounded interrogation of the resulting corpus whereas other existing tools emphasise citation-based discovery and visualisation, and/or AI-assisted search, screening, extraction, and synthesis. This architecture provides a complementary approach to existing platforms, particularly for reproducible literature-analysis workflows in which researchers need direct control over the retrieved article collection and subsequent analytical procedures. Keeping the multidisciplinary nature of this journal in view, we have skipped the system architecture and detailed algorithms of the ResearchRover software and presented how the software can be used by researchers across different domains for article retrieval and analysis. As a use case of this automated platform ResearchRover, we searched the PubMed biomedical research literature database and presented a scoping review on smart healthcare software industry.

2. Materials and Methods

ResearchRover provides a user-friendly online platform to explore research articles across publishers on a topic of interest, download articles and associate information. It allows researchers to create a local database integrated with NLP-based query support (Figure 1). It is an AI-augmented online tool that combines real-time academic search and metadata enrichment to support contextual interaction via natural language queries. This tool is designed to retrieve relevant research articles from publicly available databases, and to support semantic clustering and metadata extraction. It provides a prototype of a natural-language question answering facility based on the retrieved literature. This ResearchRover acts both as a discovery engine and a tool for higher-order scholarly synthesis. The system employs modern web architecture, featuring a responsive React frontend for user interaction and a robust Flask/Python backend that composes data retrieval, processing, enrichment, semantic analysis, and AI interaction.

2.1. Features and Functionalities of ResearchRover

ResearchRover provides a user-friendly web-based platform to explore research articles across publishers on a topic of interest, download articles and associated information to create a local database integrated with NLP based query support. At present ResearchRover provides search and download facilites from PubMed database hosted by the National Library of Medicine (NLM) as it provides free APIs that allow developers to search, retrieve, and analyse medical research data. It allows users to:

- Search and download: Users can search databases using keyword-based queries on the selected database, apply filters such as publication year and result limits to refine results.

It retrieves detailed metadata including title, abstract, authorship, publication year, DOI, and source links. Export search results in CSV format and download available PDF files in a consolidated ZIP archive for offline access.

- Analysis: Users can upload article metadata in the form of CSV file and generate word cloud and co-occurrence network of the key words used in the articles.
- AI Chat: Utilise "Rover AI," an intelligent assistant powered by a Retrieval-Augmented Generation (RAG) system, to ask natural language questions about the content of the retrieved papers and receive well-informed, citation-supported answers grounded in the content of those documents.

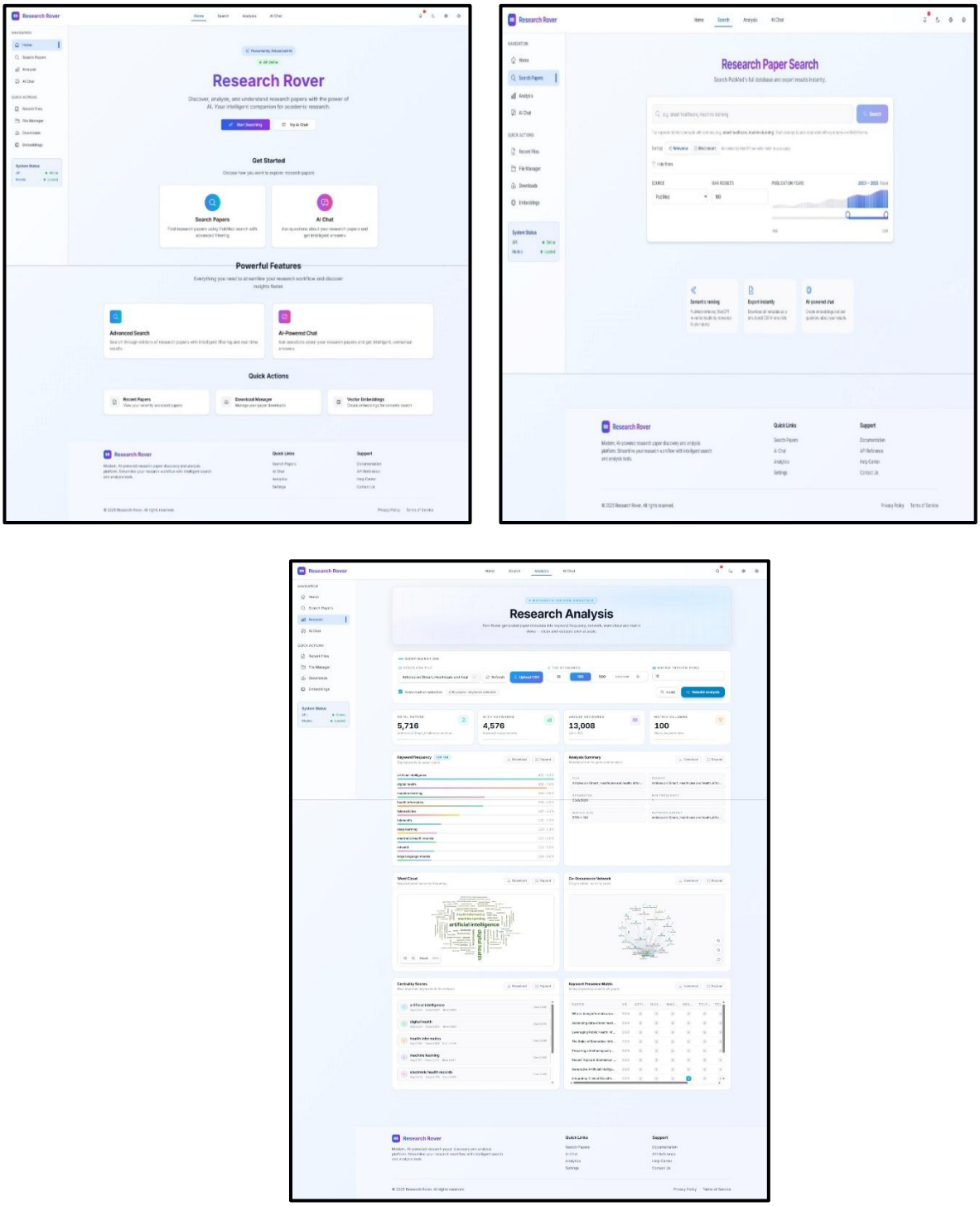


Figure 1. A three panel figure showing ResearchRover home page (top left), research article search page (top right) and analysis of research articles (bottom).

3. Results and Discussion

As a use case of this automated platform ResearchRover, we searched for biomedical research literature database PubMed and presented a scoping review on smart healthcare software industry that provides a compact view of current research scenario in smart health care software development processes. We have used the search, aggregate and analysis features of ResearchRover in this article. First, we availed keyword based analysis feature of ResearchRover for bibliometric and text-mining analysis of scientific literature followed by large language model-based research trend analysis of the article metadata revealed growth, success stories, and challenges in healthcare software industry across the globe. We have analysed in detail keywords used in these articles, which are author-selected terms that represent the major concepts, topics, methods, or themes of a scientific article. These words facilitate article retrieval, indexing, classification, and discoverability in scholarly databases and search engines, enabling researchers to locate relevant publications through topic-specific searches.

3.1. Keyword based Analysis Feature of ResearchRover for Bibliometric and Text-Mining Analysis of Scientific Literature

3.1.1 Article Search Criteria used on PubMed Database

We searched PubMed database for articles on "smart healthcare" and "health informatics" on 22 May 2026. Regarding inclusion and exclusion criteria, we considered articles in English and removed duplicates. In total 5716 articles were downloaded for this study which are available in a CSV file at https://bit.ly/4tXSJ4Z. The keyword-based analysis feature of ResearchRover helped us generate word cloud and co-occurrence networks for bibliometric and text-mining analysis of this research literature. A word cloud is a visual representation of text in which words are displayed with different sizes according to their frequency or another predefined measure. A word cloud is generally regarded as a complementary visualisation rather than a rigorous analytical method, because word frequency alone does not capture semantic relationships, context, or the importance of individual studies. For more informative analysis, a word cloud can be combined with keyword frequency statistics, and co-occurrence networks.

3.1.2 Word Cloud on "smart healthcare" and "health informatics"

The keyword distribution shows a clear concentration around digital health, artificial intelligence, machine learning, and health informatics, with several secondary themes related to healthcare delivery, clinical applications, public health, and research methodology. The word cloud is given in the Figure 2.

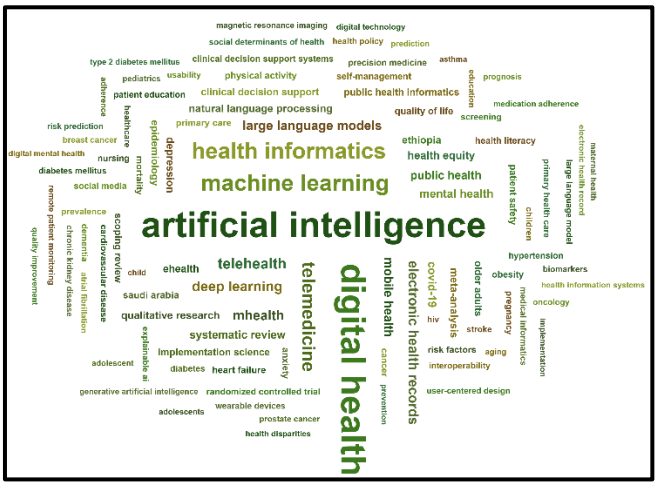


Figure 2. The figure presents distribution of keyword used in the 5716 research articles in the form of a word cloud.

The most frequent keywords are “digital health” (448 occurrences), “artificial intelligence” (439), “machine learning” (261), “health informatics” (257), “telemedicine” (186), “telehealth” (132), “deep learning” (117), “electronic health records” (112), “mHealth” (111), “large language models” (97), and “mobile health” (91). Other prominent terms include public health, mental health, health equity, clinical decision support, natural language processing, epidemiology, implementation science, and public health informatics. The occurrence of terms such as systematic review, meta-analysis, qualitative research, and scoping review also indicates substantial methodological research within the literature.

3.1.3. Keyword Co-occurrence Network Analysis

The keyword co-occurrence network provides a graphical representation of the thematic relationships and research associations within the smart healthcare and health informatics literature. This co-occurrence network for the articles under study is given in Figure 3. The network is centred on highly connected themes such as digital health, artificial intelligence, machine learning, and health informatics, which act as major hubs linking several related research areas. Strong associations among artificial intelligence, machine learning, deep learning, natural language processing, and large language models indicate the increasing integration of advanced computational and AI techniques into healthcare research. Similarly, the connections of digital health, telemedicine, telehealth, mHealth, and several health issues including obesity reflect the growing emphasis on technology-enabled healthcare delivery and remote healthcare services. Keywords related to electronic health records, clinical decision support, public health, mental health, epidemiology, and health equity form additional thematic linkages, demonstrating the application of informatics and AI across both clinical and population-health domains. Overall, the co-occurrence structure suggests that the research landscape is highly interconnected, with AI and digital health technologies serving as central themes that bridge technological development, healthcare applications, and public-health research.

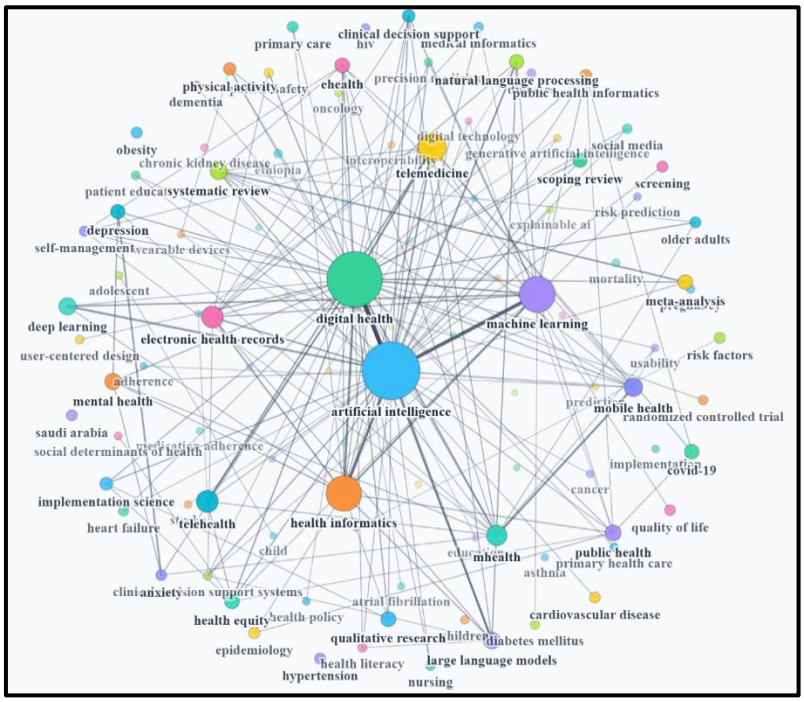


Figure 3. The figure presents distribution of keyword used in the 5716 research articles in the form of a word cloud.

3.2. Large Language Model-Based Research Trend Analysis of the Article Metadata

3.2.1 Database Search Criteria

We probed the PubMed database with the search string ("smart healthcare" OR "digital health" OR "health informatics") AND ("software" OR "software development" OR "healthcare IT") on 11 May 2026. Till date, 3617 articles on the topic were available in the PubMed database published since 1982. Bibliographic details of the articles analysed in this study are available at https://bit.ly/4tXSJ4Z. We have used an OpenAI large language model service to extract research trends from the articles considered and Microsoft Excel for preparing figures.

3.2.2 Inclusion and Exclusion Criteria

In our research trend analysis on Smart Healthcare, we focused exclusively on the PubMed database. Any article not included in the PubMed search tool was excluded and may be considered as a limitation of this research.

3.2.3. Exponential Growth in Number of Publications in PubMed Database

PubMed database publication timeline data on the articles revealed that the growth of publications was exponential since the first article was published in 1982 and the growth has increased significantly since 2016 (Figure 4). Out of the total publications, 85.84% of articles were published only after 2015.

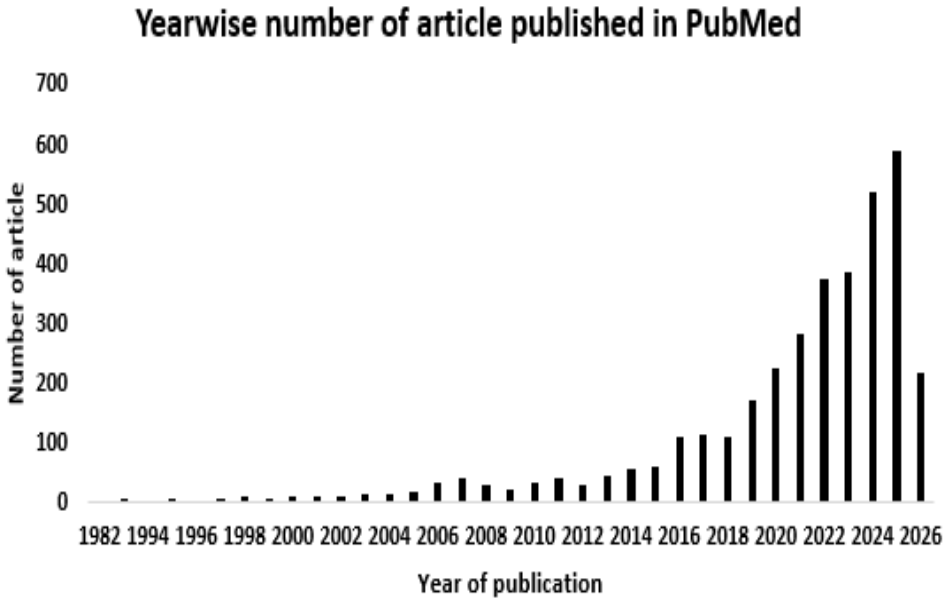


Figure 4. Year wise number of publications on smart healthcare software industry in PubMed database from 1982 till May 2026

The substantial increase in publications on smart healthcare after 2015 can be attributed to the rapid advancement of digital technologies and their widespread integration into healthcare systems. Developments in artificial intelligence, machine learning, cloud computing, big data analytics, and the Internet of Things (IoT) significantly expanded the scope of smart healthcare research. The increasing adoption of wearable devices, mobile health applications, telemedicine platforms, and electronic health record systems has also contributed to the rising demand for software-based healthcare solutions. In parallel, national, and international initiatives promoting healthcare digitalisation, along with increased investment from the healthcare and software industries, stimulated interdisciplinary research in health informatics and intelligent healthcare systems. The emergence of Industry 4.0 concepts and smart-system integration also contributed to the expansion of this field.

3.2.4. PubMed Research Articles Addressing Diverse Health Conditions

Analysis of the article titles retrieved from the PubMed database indicates that smart healthcare research has been applied to a wide range of medical and public health problems (Table 1). It can be observed that many publications focus on general healthcare monitoring and digital health systems, indicating the growing importance of intelligent technologies in healthcare management and patient care. Among specific health domains, infectious diseases including COVID-19 represented one of the most frequently studied areas, reflecting the increased adoption of telemedicine, remote monitoring, and digital surveillance technologies during recent years [19-22]. A significant amount of attention was also observed to be given by researchers to cancer care [23-24], maternal and child health [25], mental health [26], cardiovascular diseases [27], diabetes [28], neurological disorders [29], and elderly healthcare [30]. In addition, several studies addressed respiratory diseases [31], rehabilitation [32], lifestyle specific disorders [33], chronic diseases [34], and sleep related health conditions [35].

Table 1. Reference of health issues among PubMed indexed publications from 1982 till date

Sl. No	Reference for Health Issues	Number of Articles
1	Cancer	163
2	Cardiovascular Diseases	140
3	Chronic Diseases	20
4	COVID-19 and Infectious Diseases	189
5	Diabetes	92
6	Elderly and Geriatric Care	122
7	General Healthcare / Health Monitoring	2250
8	Maternal and Child Health	157
9	Mental Health	146
10	Neurological Disorders	76
11	Obesity and Lifestyle Disorders	60
12	Rehabilitation and Disability	42
13	Respiratory Diseases	63
14	Sleep Disorders	17

3.2.5. Software and Digital Technologies Specified in PubMed Research Articles Aligning with the Healthcare Challenges

The study findings show that smart healthcare technologies are used in many medical sectors. Leverage of such technology helps disease diagnosis, patient monitoring, prevention, and personalised healthcare services. Analyses indexed in PubMed show that smart healthcare research uses different technologies and digital systems to address advanced healthcare challenges (see Table 2) [36]. Artificial intelligence and machine learning are widely used for disease identification, support in clinical decision support, data analysis, and personalized treatment planning, including applications related to diabetes and skin cancer detection [37–38]. Researchers are also paying more attention to mobile health applications [39], telemedicine services [40], and IoT-based wearable devices [41]; particularly for remote healthcare and continuous patient monitoring. Other important research areas include electronic health records [42], augmented and virtual reality technologies [43], cloud computing, big data analytics [44], blockchain applications in healthcare [45], rehabilitation robotics [46], and healthcare cybersecurity [47]. Overall, these studies show that healthcare systems are increasingly depending on software-driven technologies to improve medical services and patient care.

Table 2. Health issues addressed among PubMed indexed publications from 1982 till date

Sl. No.	Software Technology Used	Number of Articles
1	Artificial Intelligence and Machine Learning	338
2	Big Data and Analytics	26
3	Blockchain	19
4	Cloud Computing	17
5	Cybersecurity and Privacy	37
6	Decision Support Systems	77
7	Electronic Health Records (EHR/EMR)	138

8	General Digital Health Technologies	2314
9	Internet of Things (IoT)	90
10	Mobile Health Applications	172
11	Robotics and Automation	12
12	Smart Monitoring Systems	14
13	Telemedicine and Telehealth	62
14	Virtual Reality and Augmented Reality	143
15	Wireless and Communication Technologies	12

Remote healthcare technologies like telemedicine services and wearable monitoring systems face several challenges. Such as those related to network connectivity, real-time data transfer, and software scalability and reliability [48]. These limitations may affect the efficiency and reliability of remote healthcare delivery and continuous patient monitoring. Several publications also imply challenges related to user acceptance, usability, digital literacy, and adoption of smart healthcare technologies among healthcare professionals and patients [49, 50]. Furthermore, regulatory approval processes, standardisation issues, high implementation costs, and the need for multidisciplinary collaboration between software engineers, clinicians, and healthcare institutions remain significant barriers for the software industry [51-53].

4. Conclusion

This article presents a use case for providing an overall view of healthcare software development process. It employs a large language model-based research literature automation software prototype, ResearchRover designed for collecting and analysing vast amounts of scientific publications available online in the public domain such as PubMed, IEEE, etc. The tool helps improve the coverage, organisation, and accessibility of scholarly information with reduced time and effort required.

Supplementary Information

This article has the following supplementary files. The download links are available alongside the article on the journal website.

a) S1:This supplementary file contains the research papers details on Smart Healthcare dataset retrieved through the ResearchRover platform (*Additional File 1: Table S1*).
b) S2: This supplementary file contains the additional dataset retrieved through the ResearchRover platform (*Additonal File 2: Table S2*).
c) S3: This figure explains the ResearchRover platform workflow (*Adddtional File 3: Figure S3*).

Multidisciplinary Domains

This research covers the domains: (a) Computer Science, (b) Health informatics, (c) Software engineering

Funding

This research received no external funding.

Acknowledgments

SSS thankfully acknowledge using computing facility of DBT funded projects DBT, GoI (No. BT/PR40231/BTIS/137/63/2023 and No. BT/PR40253/BTIS/137/52/2022). We acknowledge using the Grammarly proof reading tool for improving English language.

Conflicts of Interest

The authors declare no conflict of interest.

Declaration on AI Usage

The Grammarly (AI writing assistance) tool is used in this paper to check the language issues to make the sentences more meaningful and cohesive.

References

[1] Hart, C. Doing a literature review: releasing the social science research imagination. London: Sage Publications, **1998**. https://doi.org/10.4135/9781036235598

[2] Grant, M.J.; Booth, A. A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal*, **2009**, 26(2), 91-108. https://doi.org/10.1111/j.1471-1842.2009.00848.x

[3] Maher, D.; Aseffa, A.; Kay, S.; TufetBayona, M. External funding to strengthen capacity for research in low-income and middle-income countries: Exigence, excellence, and equity. *BMJ Global Health*, **2020**, 5(3), e002212. https://doi.org/10.1136/bmjgh-2019-002212

[4] Nakamura, G.; Soares, B.E.; Pillar, V.D.; Diniz-Filho, J.A.F.; Duarte, L. Three pathways to better recognize the expertise of Global South researchers. *Npj Biodiversity*, **2023**, 2(1), 17. https://doi.org/10.1038/s44185-023-00021-7

[5] Mark, A.H.; Pablo, G.B.; Paolo, C.; Dan, B. The strain on scientific publishing. *Quantitative Science Studies*, **2024**, 5 (4), 823-843. https://doi.org/10.1162/qss_a_00327

[6] Satapathy, S.S.; Ray, S.K. Missed cites. *Current Science*, **2014**, 1633-1634.

[7] Arksey, H.; O'Malley, L. Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, **2005**, 8(1), 19-32. DOI: 10.1080/1364557032000119616

[8] Peters, M.D.J.; Marnie, C; Tricco, A.C.; Pollock, D.; Munn, Z.; Alexander, L.; McInerney, P.; Godfrey, C.M.; Khalil, H. Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Implementation*, **2021**, 19(1), pp 3-10. https://doi.org/10.11124/JBIES-20-00167

[9] Levac, D.; Colquhoun, H.; O'Brien, K.K. Scoping studies: advancing the methodology. *Implementation Sci*, **2010**, 5, 69. https://doi.org/10.1186/1748-5908-5-69

[10] Tricco, A.C.; Lillie, E.; Zarin, W.; O'Brien, K.K.; Colquhoun, H.; Levac, D.; Moher, D.; Peters, M.D.J.; Horsley, T.; Weeks, L.; Hempel, S.; Akl, E.A.; Chang, C.; McGowan, J.; Stewart, L.; Hartling, L.; Aldcroft, A.; Wilson, M.G.; Garritty, C.; Lewin, S.; … Straus, S.E. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*, **2018**, 169(7), 467-473. https://doi.org/10.7326/M18-0850

[11] Peters, M.D.; Godfrey, C.M.; Khalil, H.; McInerney, P.; Parker, D.; Soares, C.B. Guidance for conducting systematic scoping reviews. *Int. J. Evidence-based healthcare*, **2015**, 13(3), 141–146. https://doi.org/10.1097/XEB.0000000000000050

[12] Bhutani, P.; Gupta, M.; Bajaj, G.; Deka, R.C.; Sayapathy, S.S.; Ray, S.K. Is the screen time duration affecting children's language development? - A scoping review. *Clin Epidemiol Glob Health*, **2024**, 25, 101457. https://doi.org/10.1016/j.cegh.2023.101457

[13] Guerra, F.; Bergamaschi, S.; Orsini, M.; Sala, A.; Sartori, C. KEYMANTIC: A keyword-based search engine using structural knowledge. In Proceedings of the 11th International Conference on Enterprise Information Systems- Databases and Information Systems Integration, **2009**, pg. 241-246. DOI: 10.5220/0002155802410246

[14] Malve, A.; Chawan, P.M. A comparative study of keyword and semantic based search engine. *IJIRSET*, **2015**, 4(11), 11156-11161. DOI:10.15680/IJIRSET.2015.0411039

[15] Sarica S.; Song, B.; Low, E.; Luo, J. Engineering knowledge graph for keyword discovery in patent search. Proceedings of the Design Society: International Conference on Engineering Design, **2019**, 1(1), 2249-2258. doi:10.1017/dsi.2019.231

[16] Zheng, Y.; Sun, S.; Qiu, L.; Ru, D.; Jiayang, C.; Li, X.; Lin, J.; Wang, B.; Luo, Y.; Pan, R.; Xu, Y.; Min, Q.; Zhang, Z.; Wang, Y.; Li, W.; Liu, P. OpenResearcher: Unleashing AI for Accelerated Scientific Research. In Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing: System Demonstrations, **2024**, pages 209-218, Miami, Florida, USA. Association for Computational Linguistics. doi: 10.18653/v1/2024.emnlp-demo.22

[17] Meneses, J.C.B.C.; Santos Neto, A.T.D.; Domingos, M.A.F.; Barbosa, P.L.S.; Castro, R.C.M.B.; Cunha, G.H.D.; Sixsmith, J.; Fernandes, A.F.C. Machine Learning Models for Predicting Radiation Dermatitis in Breast Cancer: A Scoping Review. Comput Inform Nurs, **2026**. doi: 10.1097/CIN.0000000000001484

[18] Ilyas, M.; Chivese, T.; Hadi, M.A.; Ncube, N.B.Q.; Khan, M.N. Multifaceted and educational interventions to improve prescribing indicators in the Middle East and North Africa Region: a systematic review and meta-analysis. *Int J Clin Pharm*, **2026**. doi:10.1007/s11096-026-02107-1

[19] Choo, H.; Lee, D.; Shin, S.Y.; Lee, J.; Lee, D.; Kim, E.; Oh, N.; Kim, C. Myeongchan Kim, M.; Kim, H.J.; Enhancing COVID-19 Screening Models With Epidemiological and Mobility Features: Machine-Learning Model Study. *JMIR AI*, **2026**, 5, e54956. https://doi.org/10.2196/54956

[20] Anastasiadou, O.; Mpogiatzidis, P.; Tzimourta, K.D.; Angelidis, P. Digital Divide: Contrasting Provider and User Insights on Healthcare Services During the COVID-19 Pandemic. *Healthcare (Basel, Switzerland)*, **2025**, 13(15), 1803. https://doi.org/10.3390/healthcare13151803

[21] Lester, R.T.; Manson, M.; Semakula, M.; Jang, H.; Mugabo, H.; Magzari, A.; Blackmer, J.M.; Fattah, F.; Niyonsenga, S.P.; Rwagasore, E.; Ruranga, C.; Remera, E.; Ngabonziza, J.C.S.; Carenini, G.; Nsanzimana, S. Natural language processing to evaluate texting conversations between patients and healthcare providers during COVID-19 Home-Based Care in Rwanda at scale. *PLOS digital health*, **2025**, 4(1), e0000625. https://doi.org/10.1371/journal.pdig.0000625

[22] Higgins, R.; Smith, R.M.; Dillingham, I.; Quinlan, J.; Speed, V.; Curtis, H.J.; Wood, C.; Wiedemann, M.; Jani, M.; Bacon, S.C.J.; Mehrkar, A.; Goldacre, B.; Collaborative, O.; MacKenna, B.; Schaffer, A.L. Opioid prescribing to people on orthopedic waiting lists during the covid-19 pandemic in England: retrospective cohort study using linked electronic health record data in OpenSAFELY-TPP. *BMJ medicine*, **2025**, 4(1), e001743. https://doi.org/10.1136/bmjmed-2025-001743

[23] Dang, T.H.; Wickramasinghe, N.; Jayaraman, P.P.; Burbury, K.; Alexander, M.; Whitechurch, A.; Dyer, M.; Quinn, S.; Forkan, A.R.M.; Schofield, P. Digital Solution to Support Medication Adherence and Self-Management in Patients with Cancer (SAMSON): Pilot Randomized Controlled Trial. *JMIR formative research*, **2025**, 9, e65302. https://doi.org/10.2196/65302

[24] Ohde, J.W.; Warner, D.O.; Egginton, J.S.; Hagedorn, H.J. Stakeholder perceptions of using "opt-out" for tobacco use treatment in a cancer care setting: a qualitative evaluation of patients, providers, and desk staff. *Implementation science communications*, **2023**, 4(1), 117. https://doi.org/10.1186/s43058-023-00493-5

[25] Goh, H.; Khuon, D.; Ung, M.; Oy, S.; Dary, C.; Khim, C.; Chhay, S.C.A.; Lee, Y.F.; Kim, R.; Yi, S.; Saphonn, V. i-MoMCARE: AI-enabled mobile app for maternal and child healthcare in Cambodia - a pilot implementation and evaluation study. *BMJ health & care informatics*, **2026**, 33(1), e101691. https://doi.org/10.1136/bmjhci-2025-101691

[26] Wang, T.; Codling, D.; Msosa, Y.J.; Broadbent, M.; Kornblum, D.; Polling, C.; Searle, T.; Delaney-Pope, C.; Arroyo, B.; MacLellan, S.; Keddie, Z.; Docherty, M.; Roberts, A.; Stewart, R.; McGuire, P.; Dobson, R.; Harland, R. VIEWER: an extensible visual analytics framework for enhancing mental healthcare.

Journal of the American Medical Informatics Association: *JAMIA*, **2026**, 33(1), 144–158. https://doi.org/10.1093/jamia/ocaf010

[27] Wright, A.J.; Panza, G.A.; Fernandez, A.B.; Robinson, P.F.; DeScenza, V.R.; Chen, M.H.; Lee, E.C.; Guidry, M.A.; Pescatello, L.S. Feasibility and Acceptability of a Novel Algorithm for Physicians to Prescribe Personalized Exercise Prescriptions to Patients with Cardiovascular Disease Risk Factors: Study Protocol for an Exploratory Randomized Controlled Crossover Trial. *Healthcare (Basel, Switzerland)*, **2026**, 14(2), 188. https://doi.org/10.3390/healthcare14020188

[28] Giger, O.F.; Pfitzer, E.; Mekniran, W.; Gebhardt, H.; Fleisch, E.; Jovanova, M.; Kowatsch, T. Digital health technologies and innovation patterns in diabetes ecosystems. *Digital health*, **2025**, 11, 20552076241311740. https://doi.org/10.1177/20552076241311740

[29] De Silva, U.; Madanian, S.; Olsen, S.; Templeton, J.M., Poellabauer, C., Schneider, S.L., Narayanan, A., Rubaiat, R. Clinical Decision Support Using Speech Signal Analysis: Systematic Scoping Review of Neurological Disorders. *Journal of medical Internet research*, **2025**, 27, e63004. https://doi.org/10.2196/63004

[30] Paiva, J.O.V.; Andrade, R.M.C.; de Oliveira, P.A.M.; Duarte, P.; Santos, I.S.; Evangelista, A.L.P.; Theophilo, R.L.; de Andrade, L.O.M.; Barreto, I.C.H.C. Mobile applications for elderly healthcare: A systematic mapping. *PloS one*, **2020**, 15(7), e0236091. https://doi.org/10.1371/journal.pone.0236091

[31] Salmi, E.M.; Basile, F.W.; Khan, F.A.; Watt, L., Song, R., Bijker, E.M. Facilitators and barriers affecting the implementation of e-health for chronic respiratory diseases in remote settings: a qualitative evidence synthesis. *BMC health services research*, **2025**, 25(1), 19. https://doi.org/10.1186/s12913-024-12050-4

[32] Salinas Gonzalez, R.S.; Pérez-de la Torre, J.; Herrera Ligero, C. Optimizing return-to-work decisions following anterior cruciate ligament reconstruction: A 12-week evaluation of objective functional assessment and rehabilitation outcomes in patients with occupational injuries. *Clinical biomechanics* (Bristol, Avon), **2025**, 125, 106532. https://doi.org/10.1016/j.clinbiomech.2025.106532

[33] Meyer, B.; Betz, L.T.; Jacob, G.A.; Krause, N.; Riemann-Lorenz, K.; Gold, S.M.; Pöttgen, J.; Heesen, C. Effectiveness of a digital lifestyle management intervention (levidex) to improve quality of life in people with multiple sclerosis: results of a randomized controlled trial. *BMC neurology*, **2024**, 24(1), 347. https://doi.org/10.1186/s12883-024-03843-5

[34] de Souza Ferreira, E.; de Oliveira, A.H.M.; Dias, M.A.; da Costa, G.D.; Januário, J.P.T.; Botelho, G.M.; Cotta, R.M.M. Mobile solution and chronic diseases: development and implementation of a mobile application and digital platform for collecting, analyzing data, monitoring and managing healthcare. *BMC health services research*, **2024**, 24(1), 1009. https://doi.org/10.1186/s12913-024-11505-y

[35] Pini, N.; Fifer, W.P.; Oh, J.; Nebeker, C.; Croff, J.M.; Smith, B.A. Novel Technology/Wearable Sensors Working Group; Remote data collection of infant activity and sleep patterns via wearable sensors in the HEALthy Brain and Child Development Study (HBCD). *Developmental cognitive neuroscience*, **2024**, 69, 101446. https://doi.org/10.1016/j.dcn.2024.101446

[36] Dendere, R.; Janda, M.; Sullivan, C. Are we doing it right? We need to evaluate the current approaches for implementation of digital health systems. Australian health review: a publication of the Australian Hospital Association, **2021**, 45(6), 778–781. https://doi.org/10.1071/AH20289

[37] Narayanan, R.; Peker, E.; DeGroat, W.; Mendhe, D.; Zeeshan, S.; Ahmed, Z. 3D IntelliGenes: AI/ML application using multi-omics data for biomarker discovery and disease prediction with multi-dimensional visualization. *BMC medical research methodology*, **2025**, 25(1), 193. https://doi.org/10.1186/s12874-025-02649-4

[38] Zheng, R.J.; Li, D.L.; Lin, H.M.; Wang, J.F.; Luo, Y.M.; Tang, Y.; Li, F., Hu, Y.; Su, S. Bibliometrics of artificial intelligence applications in hepatobiliary surgery from 2014 to 2024. *World journal of gastrointestinal surgery*, **2025**, 17(5), 104728. https://doi.org/10.4240/wjgs.v17.i5.104728

[39] Barth, J.; Schläpfer, S.; Schneider, F.; Santhanam, P.; Kowatsch, T.; Heinz, P.; Held, U.; Eicher, M.; Witt, C.M. Mobile health intervention CanRelax reduces distress in people with cancer in a randomized controlled trial. *NPJ digital medicine*, **2025**, 8(1), 269. https://doi.org/10.1038/s41746-025-01688-x

[40] Hailu, D.T.; Melaku, M.S.; Abebe, S.A.; Walle, A.D.; Tilahun, K.N.; Gashu, K.D. A modified UTAUT model for acceptance to use telemedicine services and its predictors among healthcare professionals at public hospitals in North Shewa Zone of Oromia Regional State, Ethiopia. *Frontiers in digital health*, **2025**, 7, 1469365. https://doi.org/10.3389/fdgth.2025.1469365

[41] Buchholz, S.W.; Mowbray, F.I.; Allman, G.; Verboncoeur, J.P.; Beam, L.; Small, L. Wearable Devices and Nurses' Health: Protocol for an Integrative Review. *JMIR research protocols*, **2023**, 12, e48178. https://doi.org/10.2196/48178

[42] Watson, C.H.; Masalonis, A.; Arnold, T.; Chumbler, N.R.; Plew, W. Methods and Lessons Learned from a Current State Workflow Assessment following Transition to a New Electronic Health Record System. *Perspectives in health information management*, **2023**, 20(2), 1c.

[43] Baeza-Barragán, M.R.; Labajos Manzanares, M.T.; Amaya-Álvarez, M.C. Morales Vega, F.; Rodriguez Ruiz, J.; Martín-Valero, R.; Effectiveness of a 5-Week Virtual Reality Telerehabilitation Program for Children With Duchenne and Becker Muscular Dystrophy: Prospective Quasi-Experimental Study. *JMIR serious games*, **2023**, 11, e48022. https://doi.org/10.2196/48022

[44] Ristevski, B.; Chen, M. Big Data Analytics in Medicine and Healthcare. *Journal of integrative bioinformatics*, **2018**, 15(3), 20170030. https://doi.org/10.1515/jib-2017-0030

[45] Ji, Y.; Zhang, J.; Ma, J.; Yang, C.; Yao, X. BMPLS: Blockchain-Based Multi-level Privacy-Preserving Location Sharing Scheme for Telecare Medical Information Systems. *Journal of medical systems*, **2018**, 42(8), 147. https://doi.org/10.1007/s10916-018-0998-2

[46] Zhao, L.; Zhu, C.; Xie, Y.; Li, W.; Xi, L.; Lifen, L.; YuXiu, J.; Xin, Z.; Shengjian, W.; Pan, H. Research hotspots in rehabilitation robotics applied to lower extremity rehabilitation: A bibliometric study of the top 100 most cited publications based on the Web of Science database. *Digital health*, **2026**, 12, 20552076261432283. https://doi.org/10.1177/20552076261432283

[47] Ostermann, M.; Mathias, R.; Jahed, F.; Parker, M.B.; Hudson, F.D.; Harding, W.C.; Gilbert, S.; Freyer, O. Cybersecurity requirements for medical devices in the EU and US - A comparison and gap analysis of the MDCG 2019-16 and FDA premarket cybersecurity guidance. *Computational and structural biotechnology journal*, **2025**, 28, 259–266. https://doi.org/10.1016/j.csbj.2025.07.024

[48] Sendak, M.P.; Liu, V.X.; Beecy, A.; Vidal, D.E.; Shaw, K.; Lifson, M.A.; Tobey, D.; Valladares, A.; Loufek, B.; Mogri, M.; Balu, S. Strengthening the use of artificial intelligence within healthcare delivery organizations: balancing regulatory compliance and patient safety. Journal of the American Medical Informatics Association: *JAMIA*, **2024**, 31(7), 1622–1627. https://doi.org/10.1093/jamia/ocae119

[49] Pool, J.; Fatehi, F.; Hassandoust, F.; Akhlaghpour, S. Health Data Privacy: Research Fronts, Hot Topics and Future Directions. *Studies in health technology and informatics*, **2020**, 275, 167–171. https://doi.org/10.3233/SHTI200716

[50] Cascella, M.; Pane, C.; Di Pumpo, M.; Sebastiani, E.; Bussa, M.; Tagliaferri, A.; Brunetti, B.; Meloni, P.; Bianchini, E.; Graziani, P.; Faustini, F.; D'Onofrio, G.; Manetta, D.; Catania, C.A.; Fornari, C.J.; Scarda, A.; Smanio, F.; Imbesi, C.; Avella, M.T.; Fusco, R.; … Granata, V. Digital health technologies in medicine: evidence, artificial intelligence integration, and ethical challenges. *Infectious agents and cancer*, **2026**, 21(1), 23. https://doi.org/10.1186/s13027-026-00737-8

[51] Jang, Y.; Ryoo, I.; Kim, S. Smart Hospital Sensor Network Deployment for Mobile and Remote Healthcare System. *Sensors* (Basel, Switzerland), **2021**, 21(16), 5514. https://doi.org/10.3390/s21165514

[52] Mainz, A.; Neunaber, T.; D'Agnese, P.C.; Eid, A.; Galla, T.; Ellers, C.; Meister, S. Digital Literacy Training for Digitalization Officers ("Digi-Managers") in Outpatient Medical and Psychotherapeutic Care: Conceptualization and Longitudinal Evaluation of a Certificate Course. *JMIR medical education*, **2025**, 11, e70843. https://doi.org/10.2196/70843

[53] Löchner, J.; Bolivar, M.; Booth, L.; Canella, S.; Calobro, M.; Firth, J.; Garcia-Palacios, A.; Kyritsaka, A.; Sander, L.B.; Seiferth, C.; Seizer, L.; Teesson, M.; Tyrowicz, J.; Vogel, L.; Wheeler, E.; Wolstein, J.; Schuller, B.W. Multidisciplinary perspectives on personalised prevention in youth mental health. *Frontiers in digital health*, **2025**, 7, 1568472. https://doi.org/10.3389/fdgth.2025.1568472