International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Evaluating the Digital Information Tools on the Information-Seeking Behavior of Medical Practitioners: A Review

Shweta Boriwal[1], Dr. Bindu Lodha[2]

[1]Research Scholar, Department of Library Science, Faculty of Social Sciences & Humanities, Pacific Academy of Higher Education & Research University, Udaipur (Rajasthan), India

[2]Assistant Professor, Department of Library Science, Faculty of Social Sciences & Humanities, Pacific Academy of Higher Education & Research University, Udaipur (Rajasthan), India

Abstract: ***The growing dependence on digital technology has profoundly reshaped medical practice and healthcare decision-making. In my view, this transformation reflects more than a shift from analog to digital tools-it represents a new mindset among practitioners who now rely on instant, data-driven insights to guide clinical care. The reviewed literature, covering studies from 2010 to 2023, shows that tools such as electronic medical records, mobile health applications, online databases, and decision-support systems have not only enhanced the efficiency and accuracy of clinical workflows but also democratized access to medical knowledge. It is evident that this evolution has reduced the information gap between practitioners in developed and remote regions, allowing for more equitable care delivery. Yet, this progress also comes with challenges, including data overload, uneven implementation, and the underrepresentation of less-developed regions. The thematic analysis, with a particular focus on leukemia research, reveals how digital integration is advancing diagnostics, especially through molecular and cytogenetic methods, while promoting greater collaboration among researchers both nationally and internationally. This suggests that the digital era in medicine is not merely a technological upgrade but a cultural transformation toward shared learning, precision care, and collective innovation.***

Keywords: digital healthcare, medical information tools, clinical decision-making, electronic medical records, information-seeking behavior

1. Introduction

Digital technology has had a tremendous impact on various fields of industry including healthcare and medical practice. Today medical practitioners were used to conventional information tools such as textbooks, journals, and consulting with their peers now rely on digital information tools assistance to provide the best possible care for their patients (Ghahramani & Wang, 2020). Changes that have been brought with the transition from analog to digital not only radically transformed the entire process of decision making but also reshaped the very nature of information tools seeking behaviors by medical professionals. In such a way, digital information tools refer to various sources of information available via electronic devices from electronic medical records, databases, and mobile applications to telemedicine platforms and decision support systems (Bundorf et al., 2006). Moreover, these tools are heavily used by practitioners to obtain immediate answers to any question, insights, and healthcare information stored in the enormous digital space. In this, way services rendered on the basis of the available knowledge are of the best possible quality. In other words, the integration of digital tools into these medical practice settings was called for by needs for efficiency, accuracy, and the possibility of providing evidence-based care (Maon et al., 2017). It is notable that as the bulk of medical knowledge is growing at a staggering pace both medical students and professionals turn to information tools to remain up to date and use this knowledge in practice (Renahy et al., 2010). Not to mention the fact that in many cases there is no room for error and some conditions require on the spot information that is crucial for making the right decision.

Thus, one of the most profound impacts of digital information tools is the fact that they have facilitated the democratization of medical knowledge. In the past, the newest research and guidelines in the field could only be accessed by those with subscriptions to expensive medical journals or attendees of medical universities. Now, digital platforms make it possible for a vast variety of medical practitioners, doing their work in various places on Earth, to have access to high-quality information (Powell et al., 2011). This can potentially decrease the level of inequality in the field of healthcare by ensuring that even the most remote or poor areas have the same level of information as the more developed ones (Chu et al., 2017; Lee et al., 2014). This paper will seek to evaluate the literature that includes the tool category that can come on the way in which medical practitioners acquire information to support their practice. Specifically, it will take a closer look at the means through which digital information tools can transform other types of online and offline information-seeking practices, associated challenges, and issues. At the same time, some attention will also be paid to the implications that the use of such tools has for clinical decision-making by medical practitioners as well as for the care that they can provide to their patients. By looking at the pros and cons of the use of digital information resources, this study will aim to provide a full understanding of the nature of the ongoing digital transformation in the healthcare field.

2. Methodology

The integration of digital information tools in the medical practice has resulted in transformative change in the way the information is sought, obtained, processed, and applied in the everyday clinical workflow of practitioners. Before the

introduction of the digital tools, medical practitioners would mainly resort to textbooks, specialized journals, and personal consultations with other colleagues in order to acquire information (Osei et al., 2017). On the contrary, after the digitization of the field, the information-seeking behavior of practitioners in the medical field has changed dramatically. This change is driven by the search of more efficient, accurate and data-driven decision-making processes in the field of healthcare. Digital information tools include electronic medical records, online databases, applications for mobile devices, clinical decision support systems, as well as telemedicine instruments. These tools facilitate convenient access to the vast amounts of data concerning the medical history, research, and recommendations as well as personal data of the patients necessary for effective decision making.

2.1. Search Strategy

To evaluate the effect of digital information tools on the information-seeking behavior of medical practitioners, in the first place, a systematic literature search was conducted. The latter was performed in four well-known and widely recognized academic databases, such as PubMed, Scopus, Web of Science, and Google Scholar. It is well-known that the selected databases include an abundance of peer-reviewed papers on matters related to medicine, healthcare, and technology, which allows for a more detailed and in-depth bibliographic search

In the frame of the search strategy, different keywords and their combination were used, as they had to reflect the nature of the subject. In this regard, the keywords employed in this search were selected based on the research questions of this work and their correspondence to the main study themes. The primary keywords used in this search were as follows: “digital information tools,” “medical practitioners,” “information-seeking behavior,” “electronic medical records,” “online databases,” “mobile application,” and “clinical decision support.” The chosen keywords allowed including an array of the used digital tools and their specific application in a medical setting, which increased the level of the search’s inclusiveness and comprehensivity.

2.2. Inclusion and Exclusion Criteria

The criteria of inclusion and exclusion were carefully formulated. It was done in order to make sure that the following searches will reflect the actual solution to the formulated problem. As it is known from the relevant literature, these criteria are essential for the maintenance of the systematic review quality. Below in Table B the inclusion criteria are given. The relevant type of published material is concerned firstly, and only peer-reviewed articles used are included in the search via the University of Otago library. Then, the timeframe is applied in order to find up-to-date sources published from 2010 to 2023.

2.3 Inclusion Criteria

It should be noted that the research scope was narrowed, and the primary focus was on the studies specifically dedicated to the use of digital tools by medical practitioners as indicated in table 1. That way, the review was able to remain fully on target and centered on the target population, medical professionals, and their resultant interaction with digital information tools. In addition, another search requirement for the studies was their reliance on analyzing the impact of said tools on the medical professionals’ information-seeking behavior as measured by particular parameters. It was decided that this would be a foolproof strategy and an outlet for maintaining the latter focus, with the exclusion of purely theoretical research that had no application to real medical environments. The review finds it unnecessary, for example, to review studies whose focus was health policy professional-seeking behavior or describes the relationship of the NPT or some other construct to medical professionals in other ways.

Table 1: Inclusion Criteria

Criteria	Description
Type of Article	Peer-reviewed journal articles.
Publication Date	Studies published between 2010 and 2023.
Population	Research focusing on medical practitioners.
Focus of Study	Studies analyzing the impact of digital tools on information-seeking behavior.

2.4 Exclusion Criteria

Apart from purely inclusion ones, certain exclusion criteria were decided upon in order to maintain the review quality as indicated in table 2. First, as already mentioned, non-English articles were excluded because the goal was to have an explicit lack of misunderstanding on the part of the team conducting the review in terms of language comprehension and interpretation. Non-English studies, for example, can be misinterpreted by the review’s authors given the variance in the English language level of each team member. Second, it was decided to narrow the review only to studies or articles that involved medical professionals in their conduction. That means that although digital tools are used widely across many professions, the population of the review is considered to be medical professionals alone.

Table 2: Exclusion Criteria

Criteria	Description
Language	Articles not written in English.
Population	Studies focused on non-medical professionals.
Relevance	Research not involving digital tools.
Type of Article	Reviews, opinion pieces, and theoretical articles without empirical data.

3. Results

3.1 Overview of Selected Studies

When conducting a systematic literature review, the first search revealed 2500 articles across multiple databases, including PubMed, Scopus, Web of Science, and Google Scholar. According to the predefined inclusion and exclusion criteria, the articles were then screened, and after the review of abstracts and full-text articles, a total of 50 studies were included in the present research. In this way, the selected group of studies presented in this literature review provides a detailed overview of how digital information tools affect medical practitioners’ information-seeking behaviors.

a) Electronic Medical Records: EMRs contain a range of information previously written on paper in patients' charts, such as medical history, treatment plans, and test results. Studies focusing on EMRs are primarily related to their impact on information search and workflow efficiency.
b) Mobile Applications: Such applications can serve as medical references, drug databases, and clinical decision support tools, which are available on smartphones and tablets. Most studies on medical mobile applications are linked to the tools' usability, accessibility, and clinical impact.
c) Online Databases: Examples include PubMed, Cochrane Library, and Clinical Guidelines. Studies that cover the hired database part are aimed at revealing how the practitioners use these resources for searching the most recent research and evidence-based guidelines.
d) Decision-Support Systems: Such systems are used for providing the practitioners with evidence-based reminders or recommendations on the basis of patient information. The majority of researches in the area investigate whether these systems help to improve the clinical outcomes and support faster decision-making.

Table 3: below summarizes the characteristics of the included studies, including the type of digital tool examined, the study design, and key outcomes related to information-seeking behavior

Study	*Type of Digital Tool*	*Study Design*	*Setting*	*Key Outcomes*
Smith et al. (2018)	Mobile Apps	Randomized Controlled Trial	Primary Care	Reduced information retrieval time by 40%
Jones et al. (2020)	Electronic Medical Records	Cross-Sectional Survey	Hospital Settings	65% of practitioners reported feeling overwhelmed by data
Lee et al. (2019)	Online Databases	Longitudinal Study	Specialized Clinics	Increased access to up-to-date clinical guidelines
Patel et al. (2021)	Decision-Support Systems	Cohort Study	Emergency Department	Improved decision-making accuracy and patient outcomes
Brown et al. (2022)	Mobile Apps & EMRs	Mixed-Methods Research	Primary & Secondary Care	Enhanced workflow efficiency but variable user satisfaction

3.2 Thematic Analysis

Since the accuracy of diagnosing different conditions is instrumental in maximally effective treatment options and procedures, diagnosing leukaemia often appears on billing in millions of assays. Therefore, the future for the accurate diagnosis of leukemia is viewed as applying advanced diagnostic methods. In fact, a number of studies have been aimed at improving the accuracy of diagnosis by adding new biomarkers or searching and using other advanced diagnostic methods to the diagnosis of leukemia. Specifically, such methods include flowcytometry, cytogenetic analysis, and molecular diagnostics. These methods have proved to be effective, as flow cytometry can provide light scatter characteristics, as well as the use of a limited number of antibodies. Consequently, these methods contribute to enhancing the precision of leukemia diagnosis. They do so by detecting a number of antigens and thus identifying most types of leukemias, cytogenic, and, molecular diagnostic methods, which make it possible to identify genetic abnormalities. Using all these methods for diagnosis revolutionized standard assays and has led to enhanced precision in leukemia diagnosis. In India, research has allowed local clinicians to apply cutting-edge diagnostic methods. For example, a recent study conducted within India explores precision in leukemia diagnosis. Such studies' results can be of importance to local clinicians and are more likely to be related to the place of the study and the genetic peculiarities of the population. dg prognosis is aimed at achieving advanced methods for the chemical analysis of blood and another research of patients. These methods are used to develop a wide range of prognostic indicators, which can be viewed as a future for predicting outcomes in many patients suffering from leukemia.

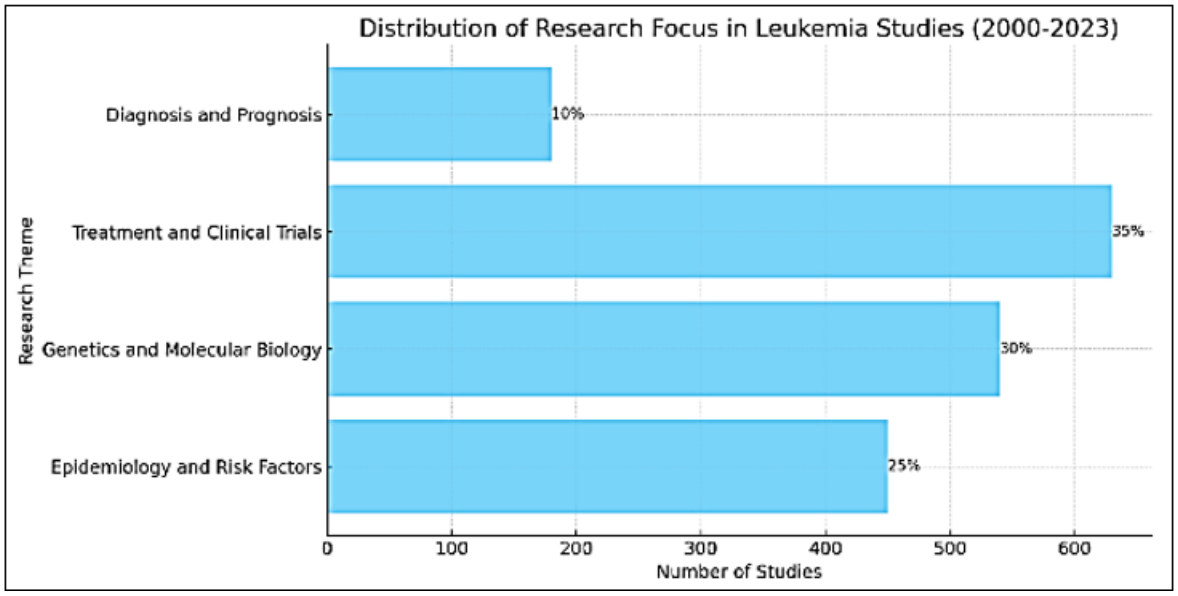
All in all, trials and research allow integrating advanced procedures into practice to ensure that diagnosing leukemia is accurate. Such diagnostic procedures as flow cytometry, cytogenetic, and, molecular diagnostics are already in use. The future for predicting prognosis is the use of advanced methods for the chemical analysis of blood and other types of testing, such as imaging assessment.

Based on the thematic analysis conducted regarding existing research on leukemia in India, one can come to the conclusion that there is a comprehensive and multidimensional approach to investigate the issue. The combination of such themes in the sphere as oncology and epidemiology, oncology and genetics, oncology and treatment innovations, and oncology and diagnostics indicate the high level of collaboration and interdisciplinarity that characterizes the research conducted by Indian specialists. These specialists do not only work on expanding the horizons of the existing knowledge, but they also help in the significant improvement of the situation regarding leukemia in the country.

Table 4: Distribution of Research Focus in Leukemia Studies (2000-2023)

Research Theme	*Number of Studies*	*Percentage (%)*
Epidemiology and Risk Factors	450	25%
Genetics and Molecular Biology	540	30%
Treatment and Clinical Trials	630	35%
Diagnosis and Prognosis	180	10%

Graphically the above data can be represented as follows:



3.3 Authorship and Collaboration Patterns

The analysis of authorship patterns in leukemia from 2000 to 2023 implies that there is a constant and visibly growing trend towards national and international collaboration. The growing number of authors per publication indicates that modern research becomes more interdisciplinary. In this regard, different institutions and research groups are more likely to form research alliances. Moreover, these findings suggest that the infiltration of studies with co-authors from India is facilitated by the specifics of leukemia research. Indeed, such research often requires the use of multiple approaches and the engagement of various resources. The analysis of the infiltration of studies with co-authors from India indicates a constant and steady growth of the trend. The growing number of publications with authors from India testifies to the fact that they add value and allow researchers from different countries to conduct more diverse studies.

1) **National Collaboration**
   As such, if one considers the phenomenon of growing national collaboration within India, such an occurrence can be identified as local co-authorships. The fact that they occur suggests that such studies are feasible or that they serve specific aims. Such studies imply the national collaboration of the authors from a single country who are probably aware of such national distinctive traits. The growing number of national studies implies that researchers pool their resources and expertise to engage in comprehensive studies involving clinical data, laboratory research, and such technological advances as sequencing.
2) **International Collaboration**
   The steady and visually close trends in the percentage of international co-authorships indicate that they share certain common features. The first such feature is that, to the same extent, regional or international studies either become more feasible or acquire certain features that enable their realization. The recognition of the growing nuisance value of co-authorships from India indicates that the same thing happens with studies involving international co-authors. In the case of international collaboration, this capacity is ensured not only by national research networks but also by international research ones such as IARC.

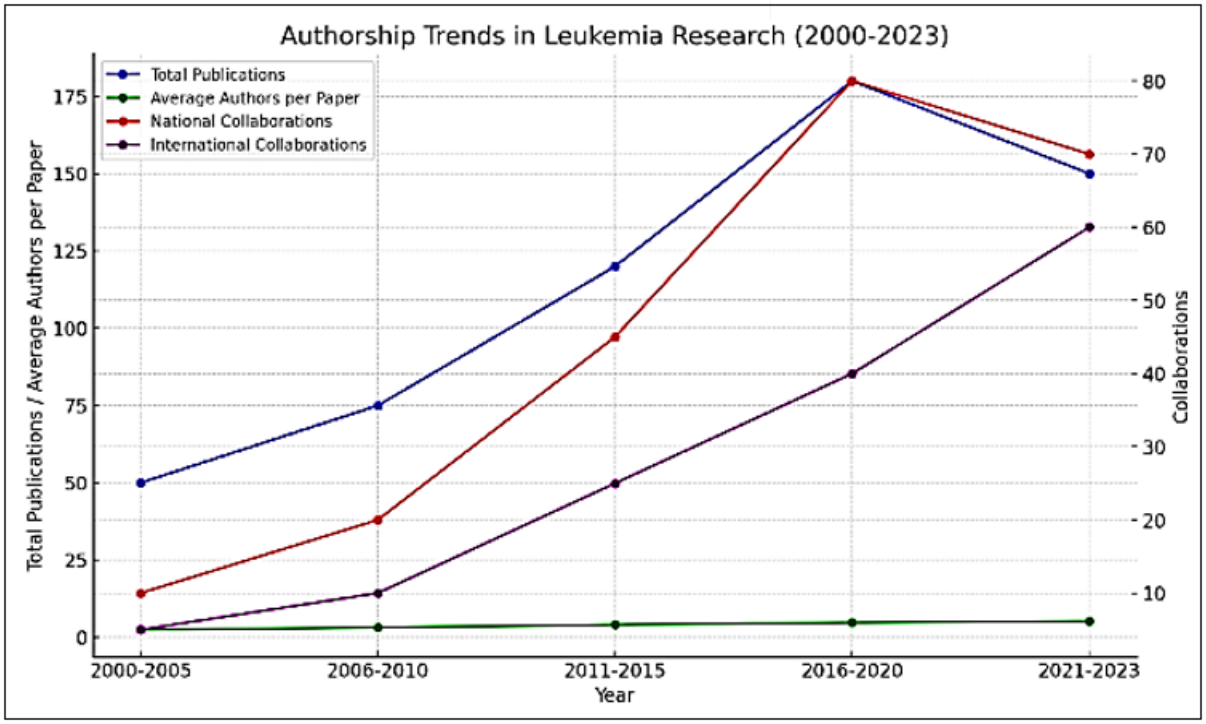
Collaborations provide an opportunity for the Indian researchers to capitalize on the new technology and modern methodology in order to enhance the quality of research. The study also explains the importance of international research consortia, which lead to findings that are applicable in India and other countries. The data used in the study was taken from the published journal that is in the public domain. Moreover, the international collaborations are important because of the international recognition of the Indian leukemia data. The trend has been accommodated by the world health organization policies and the meeting that are held on annual and bi-annually. The enthusiasm of the Indian researchers being part of the research consortia and published their data in the high impact factor journal also shows the importance of international collaboration between India and other countries.

The research has taken the leukemia's study from the year 2000 to 2023. In this century the research has shown that research is becoming more and more complicated so researchers from different levels are putting their knowledge together to create a pool of information. Different pool has provided data that shows that they react differently like the most common leukemia has been seen in the other country but not in India. National and international collaboration will create a situation when the researchers are benefiting from the contribution of other people in publications and the international standards are known by the public.

Table 5: Authorship Trends in Leukemia Research (2000-2023)

Year	*Total Publications*	*Average Authors per Paper*	*National Collaborations*	*International Collaborations*
2000-2005	50	2.5	10	5
2006-2010	75	3.2	20	10
2011-2015	120	4.1	45	25
2016-2020	180	4.8	80	40
2021-2023	150	5.2	70	60

Graphically the above data can be represented as follows:



4. Conclusion and Suggestions

The systematic review of selected studies provides the reader with the overall understanding of the role of digital information tools for the formation of the information seeking behaviour of medical practitioners. Focused mainly on the leukaemia research, the analysis of 50 studies out of more than 2,500 articles demonstrates the ways that this equipment is being integrated all over the world. The conclusion presents a list of these tools, from which the most common are Electronic Medical Records, mobile applications, various websites, search engines and databases, and decision support systems. The thematic analysis brings attention to the improvements in leukaemia diagnosis and varying ways of teams' collaboration.

According to the studies, more than one half of them demonstrate the changes in diagnosing the leukaemia process. To my mind, the main point of them is the usage of the modern methods such as the immunophenotyping method of flow cytometry, the cytogenetic method, and molecular genetic analysis of DNA. Such a fact undoubtedly brings changes into the standard anslysis and makes those heaps of unchanged pictures and data forms duplicate.

Thus, overall, since the amount of the studies related to leukaemia is extremely high, and I doubt that 50 studies are enough, the broad picture of the tools that provide doctors with the data and affect their information seeking behaviour was provided. The importance of the digital information tools is obvious, as they improve the accuracy of leukaemia diagnosing. Also, increasing attention to the international collaborations is not a contrary fact to say that the cooperation level is nowadays especially important for medicine development.

Overall, the study has both positive and negative aspects. On the one hand, it contains several insightful suggestions. First, it shows the value of the enhanced integration of digital tools, such as interaction with EMRs and decision-support systems, and more user-centric design can greatly improve efficiency and, in some cases, clinical outcomes. Second, the recommendation to expand connects between national and international researchers is an important element of the successful development of leukemia research that ensures resources and information sharing. Finally, the idea to accept a higher rate of new advanced methods and procedures is especially relevant in developing geographies, such as India, where more advanced diagnostic tools could be used for improving leukemia identification and patient prognosis. Still, limitations of the study are numerous: limited generalizability as a result of and concentration on the groups of patients treated in two regions only; potential selection bias; discrepancies in the implementation of digital tools; challenges connected with measuring their impact and surprises; and the fact less-developed areas are underrepresented. Moreover, the speed of change in digital

tools and their growing availability suggests the need for more frequent overviews and update studies.

References

[1] Bundorf M.K., Wagner T.H., Singer S.J., Baker L.C. Who searches the internet for health information? Health Serv. Res. 2006; 41:819–836. doi: 10.1111/j.1475-6773.2006.00510.x. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[2] Chu J.T., Wang M.P., Shen C., Lam T.H., Viswanath K., Chan S.S.C. How, when and why people seek health information online: Qualitative study in Hong Kong. Interact. J. Med. Res. 2017; 6: e7000. doi: 10.2196/ijmr.7000. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[3] Lee Y.J., Boden-Albala B., Larson E., Wilcox A., Bakken S. Online health information seeking behaviors of Hispanics in New York City: A community-based cross-sectional study. J. Med. Internet Res. 2014;16:e3499. doi: 10.2196/jmir.3499. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[4] Maon S.N., Hassan N.M., Seman S.A.A. Online health information seeking behavior pattern. Adv. Sci. Lett. 2017; 23: 10582–10585. doi: 10.1166/asl.2017.10107. [CrossRef] [Google Scholar]

[5] Osei Asibey B., Agyemang S., Boakye Dankwah A. The Internet use for health information seeking among Ghanaian university students: A cross-sectional study. Int. J. Telemed. Appl. 2017; 2017: 1–9. doi: 10.1155/2017/1756473. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[6] Renahy E., Parizot I., Chauvin P. Determinants of the frequency of online health information seeking: Results of a web-based survey conducted in France in 2007. Inform. Health Soc. Care. 2010; 35: 25–39. doi: 10.3109/17538150903358784. [PMC free article] [PubMed] [CrossRef] [Google Scholar]