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Patient's Opinions on the Use of Artificial Intelligence in Healthcare: A Systematic Review

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Abstract

Background: Given that artificial intelligence (AI) is a newly emerging field transforming the practice of medicine, the end-user perspective is of paramount importance for its success and acceptance.

Objectives: This systematic review aimed to capture an overview of qualitative and quantitative surveys related to patients' opinions on the use of AI within healthcare settings.

Methods: In this systematic review, a query was conducted on PubMed for original studies that surveyed patients' opinions using qualitative and quantitative methods. The key inclusion criteria were papers assessing patient viewpoints assessed by interviews and those exploring opinions via questionnaires. The data extraction process involved collaborative analysis to ensure reliability.

Results: This systematic review analyzed 26 studies on patient perspectives of AI in healthcare. The majority of articles used quantitative surveys (65.4%) or qualitative interviews (19.2%), with convenience and purposive sampling being the most common. Cancer patients were the most frequent group studied (26.9%), with research on AI applications in cancer care. The key factors examined in quantitative surveys were prior AI exposure, perceptions of the advantages/drawbacks of AI, and privacy/trust concerns. Qualitative studies focused on AI knowledge, usage barriers, benefits, and facilitators.

Conclusion: This literature review examined how demographic factors, trust, and knowledge impact patient perspectives on integrating AI in healthcare. The obtained results highlighted the need for educational initiatives to address knowledge gaps and facilitate the smooth integration of AI-powered solutions, leveraging their potential to enhance patient care and service delivery.

Keywords: Artificial Intelligence, Evaluation frameworks, Evaluation models, Evaluation theory, Health informatics

1. Background

The rapid advancements in digital transformation have profoundly impacted various aspects of our daily lives, including social, economic, and political spheres (1) The recent digital health platforms have revolutionized disease prevention, early detection of diseases, tele-monitoring of chronic diseases, and personalized care, as well as advanced diagnostic and treatment methods (2). In addition, they provide a rich health data source (3). This transformation is made possible by healthcare professionals harnessing the power of artificial intelligence (AI) to integrate daily medical information into patient support systems (1).

AI techniques, including machine learning, hold tremendous potential to empower patients by providing them with valuable health information that may have otherwise been inaccessible. This can enable patients to make more informed, data-driven decisions about their health and encourage the adoption of healthier lifestyle habits (3). The establishment of effective AI systems for patient care requires access to large, comprehensive patient datasets. To achieve this, researchers must obtain the participation of vast numbers of patients in AI-focused studies to explore patients' perspectives, needs, and concerns thoroughly.

Numerous healthcare institutions are now investigating methods to leverage extensive and representative health data sets to establish a learning healthcare system that can benefit patients. Nonetheless, this type of research often involves data analysis without obtaining explicit consent from individuals, unlike traditional clinical studies that require consent-based participation from data subjects (4). Patients' perceptions of AI in healthcare are affected by diverse factors, including their previous experiences with illness, interactions with health systems, and existing technologies in this domain. Furthermore, individuals' comfort levels with other forms of information technology shape their beliefs about the values and goals associated with healthcare technologies. These beliefs, in turn, inform how patients engage with AI-based systems (5).

While some patients are generally familiar with the application of AI in clinical contexts today, many still find it a relatively novel concept. Studies have pointed out that patients desire active involvement in the development and implementation processes of AI technologies while also seeking education about their use (6). The successful integration of smart technologies into community care settings presents complex challenges that require input from technical experts and insights from potential future users. These users can help identify both the benefits and

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drawbacks associated with specific technological solutions (7).

AI holds great promise for fostering independent living conditions, improving mental health outcomes, and enhancing physical well-being, thereby improving overall quality of life (8). As technology-assisted interventions continue expanding within healthcare settings, the role of robotics is becoming increasingly significant (9). The successful deployment of robots should be guided by a comprehensive understanding of the factors affecting their acceptability. This understanding will contribute to realizing the full potential benefits offered by these novel technological advancements (10).

2. Objectives

This systematic review aimed to capture an overview of qualitative and quantitative surveys related to patients' opinions on the use of AI within healthcare settings.

3. Methods

Our previous study comprehensively searched the English literature to thoroughly analyze the existing research on end-user perspective and acceptance models for AI products (11). We extracted 3,714 papers from PubMed on developing and validating reliable questionnaires. In the current study, we focused on original research studies that specifically surveyed patients' perspectives using qualitative and quantitative methods. The two major inclusion criteria were:

- Papers that assessed patients' viewpoints through qualitative methods, such as semi-structured or structured interviews
- Articles that delved into patients' opinions and perspectives using questionnaires, even if the research instruments had not undergone formal validation

The general exclusion criteria were non-English, study protocols, and editorial pieces. The specific exclusion criteria entailed:

- Needs assessment studies and Delphi technique articles
- Research focused on health or disease risks, as well as potential health service consumer protocols
- Qualitative and quantitative studies on AI perspectives that did not include patients
- Framework-based AI studies that had been reported in a previous review

The data extraction and analysis process was a collaborative effort involving the corresponding author (TH) and the first author (KZ). To ensure the reliability of data extraction, a random sample of 10 papers (one-third of the total included papers) that focused on qualitative and quantitative surveys of end users' perspectives on AI applications was selected. The data from these 10 papers was extracted and analyzed using a separate spreadsheet file.

The data extraction checklist was modified as needed throughout the study to capture the relevant information. The following details were extracted from each included paper: authors' names, publication year, countries where the research was conducted, the types of participants involved, study design, data collection methods, data analysis software, sampling techniques used to select participants, sample size, baseline characteristics of the participants, any pre-testing of the research instruments, and the scope of the questions asked.

The features of the papers were allocated to two general and specific categories. General items include authors' names, publication year, countries where the research was conducted, the types of patient participants, study design, data collection methods, data analysis software, sampling techniques, sample size, and pre-testing of the research instruments. Since two types of studies evaluating patients' views on artificial intelligence, quantitative and qualitative, were included in the systematic review, specific items were extracted separately for each study type. For quantitative studies, the evaluated scopes in the questionnaire were extracted. For qualitative studies, the main qualitative codes extracted from the interviews were documented.

4. Results

After importing the records retrieved from our systematic review, a total of 3,714 records were obtained. The initial screening process involved reviewing the titles and abstracts of these records, resulting in 139 potentially relevant papers. Following that, the full text of these 139 papers was assessed to determine their suitability for inclusion in the review. Among these, 110 papers were excluded as they fell outside the scope of the review, including qualitative interview studies and surveys that were not focused on patients (n=102). In addition, the records published in languages other than English (n=2), protocol papers (n=1), and editorial papers (n=5) were also excluded. Finally, 26 papers were included in the study.

Years and countries

The distribution of publication years among the identified papers is as follows: 11.5%, 23.1%, and 7.7% in 2019, 2020, and 2021, respectively. Both 2022 and 2023 had the highest representation at 26.9% and 30.8%, respectively. The most common publication years among the identified papers were 2022 and 2023. On the other hand, 2021 had the lowest representation, with only 7.7% of documents falling in that year. Regarding the countries of origin

for the identified papers, the UK and USA had the highest representation at 19.2%, followed by Germany (15.4%), France (11.5%), Italy (7.7%), Korea (7.7%), and the Netherlands (7.7%). Australia, China, Norway, and Denmark had lower representations.

Study design, sampling technique, data gathering methods, and sample size

Quantitative survey design is the most common study design, accounting for 65.4% of the total studies, followed by qualitative interviews, representing 19.2% of the studies. Three studies used qualitative and quantitative design (12, 13). Furthermore, in the study by Parry et al., randomized controlled trials along with qualitative semi-structured interviews account for 3.8% of the studies (14). The means and 95% confidence intervals for sample size in each of the different study designs were as follows: qualitative survey: Mean=46 (CI, 95%, 15.8-77.3), quantitative survey: Mean=431.2 (CI, 95%, 193.3-669.2).

In qualitative studies, four papers were conducted using semi-structured interviews, and one study was performed via videoconferencing. A total of 17 studies used quantitative design. In quantitative studies, 11 papers used paper-based questionnaires. Four papers were conducted using paper and web-based questionnaires, and two participants did not report the method used. Semi-structured interviews and questionnaires were used in the studies that used both qualitative and quantitative study design. Based on our findings, convenience sampling was the most commonly reported method among the identified papers, representing 61.5% of the total, followed by purposive sampling (23.1%). Random sampling was only reported in 3.8% of identified papers. Furthermore, a portion of retrieved articles, accounting for 11.5%, did not specify the sampling method used in their documents.

The means and 95% confidence intervals for sample size in each sampling method were as follows: convenience sampling: Mean=40 (CI, 95%, 13.8-66.6), purposive sampling: Mean=32 (CI, 95%, 13.7-77.8). Moreover, the sample size was considered to be 397 in one paper that used random sampling.
Table 1 displays the characteristics of ed papers.

Participants

Cancer patients were the most frequent group seeking to utilize AI in healthcare (13, 23, 27, 30, 35, 36), comprising 26.9% of the total studies. Our findings demonstrated that particular aspects of cancer care were under investigation for AI applications, including the management of skin cancer (23, 36), breast cancer (35), and radiotherapy treatment (34). Tran et al. assessed neurological disorders linked to cancer, diabetes, asthma, and rheumatologic conditions (13). The perspective on AI in healthcare was evaluated among patients who underwent neurosurgery for brain tumors in the study by Palmisciano et al. (28).

Two studies by Nadarzynski et al. (15, 26) examined the barriers, facilitators, and acceptance of AI in providing sexual health advice. Using AI, Gonsard et l. investigated children's perspectives on daily asthma management (12). Patients with gastrointestinal disorders were included in two studies. In the study by Fritsch et al., patients were selected for an endoscopic procedure (20). At the same time, van der Zander et al. examined the perspectives of both patients and physicians regarding the use of AI in gastrointestinal disorders (21). Svendsen et al. investigated the use of AI in the management of low back pain (LBP) (16), while Parry et al. studied orthopedic surgery patients (14).

Richardson et al. studied outpatients who had a recent primary care visit (5). The stated research focused on the experiences or outcomes of patients who visited primary care facilities. Aggarwal et al. conducted research in outpatient waiting areas or inpatient wards over 12 weeks (19). Their study may have explored various aspects of patient care and experiences in these healthcare settings over a specific timeframe. Kim et al. focused on emergency medical practice and delved into the use of speech and video information recognition technology in emergency medicine to improve health care (22).

Ibba et al. addressed patients who required radiology services and explored how AI could be utilized in radiology for diagnostic imaging or interpretation (33). Haan et al. conducted research in the field of radiology without selecting participants based on clinical indication or medical history. This approach suggests that their study may have aimed to assess more general applications or perceptions of AI in radiology, regardless of specific medical conditions (17). Kosan et al. studied dental emergency patients, indicating that their research likely focused on how AI could be used to detect caries and patients' trust in urgent dental care situations (29). In the same context, Ayad et al. examined dental patients, suggesting that their study may have investigated the advantages, disadvantages, and patient trust of AI in dental practice (31).

Pelly et al. looked at individuals with a history of myocardial infarction who used AI for the secondary prevention of heart disease. The referred study explored how AI technologies could assist in managing and preventing cardiovascular conditions in high-risk populations (32). Armero et al. explored patients' perspectives on the use of AI in anesthesiology during pregnancy. Their research may have focused on understanding patient attitudes, knowledge, or acceptance of AI applications in anesthesia care for pregnant individuals [25]. Meyer et al. studied US users of the Isabel symptom checker. The mentioned study investigated the effectiveness

or user experience of a specific symptom-checking AI tool among individuals in the United States over a specified timeframe (24). Table 2 presents the study design, patients' participants, and data gathering location in identified papers.

Table 1. Characteristics of the identified papers

R	Authors	Publication year	Country	Analysis software	Sampling technique	Sample Size	Pre-testing
1	Nadarzynski et al. [15]	2021	UK	Excel	Purposive sampling	40	No
2	Gonsard et al. [12]	2023	France	DAGitty, R	Purposive sampling	104	No
3	Richardson et al. [5]	2022	USA	NVivo	Not reported	87	No
4	Svendsen et al. [16]	2022	Norway Denmark	NVivo	Not reported	25	(pre and post-interviews)
5	Haan et al. [17]	2019	Netherlands	Not reported	Purposive sampling	20	No
6	Tran et al. [13]	2019	France	NVivo	Purposive sampling	1183	No
7	Couture et al. [18]	2023	France	Excel, SPSS, NVivo	Not reported	21	No
8	Aggarwal et al. [19]	2021	UK	SPSS	Convenience sampling	408	No
9	Fritsch et al. [20]	2022	Germany	Not reported	Convenience sampling	452	Yes
10	Van der Zander et al. [21]	2022	Netherlands	SPSS	Convenience sampling	337	No
11	Kim et al. [22]	2022	Korea	R	Convenience sampling	270	No
12	Parry et al. [14]	2023	USA	SAS	Random sampling	397	No
13	Jutzi et al. [23]	2020	Germany	Microsoft Excel, SigmaPlot	Convenience sampling	298	No
14	Meyer et al. [24]	2020	USA	SPSS	Convenience sampling	329	Yes
15	Armero et al. [25]	2022	USA	SAS	purposive sampling	349	No
16	Nadarzynski et al. [26]	2020	UK	SPSS	Convenience sampling	257	No
17	Yang et al. [27]	2019	China	SPSS	Convenience sampling	402	Yes
18	Palmisciano et al. [28]	2020	UK	Not reported	Purposive sampling	20 qualitative\ 107 quantitative	No
19	Kosan et al. [29]	2023	Germany	SPSS	Purposive sampling	140	Yes
20	Lee et al. [30]	2020	Korea	SPSS	Convenience sampling	287	No
21	Ayad et al. [31]	2023	Germany	SPSS	Convenience sampling	265	No
22	Pellyet al. [32]	2023	Australia	NVivo software	Convenience sampling	38	No
23	Ibba et al. [33]	2023	Italy		Convenience sampling	2119	No
24	Temple et al. [34]	2023	UK	SPSS	Convenience sampling	95	Yes
25	Pesapane et al. [35]	2022	Italy	Not reported	Convenience sampling	800	Yes
26	Nelson et al. [36]	2020	USA	NVivo software	Convenience sampling	48	Yes

Table 2. Study design, patients' participants, and data gathering location in identified papers

R	Authors	Study design	Patients' participants	Data gathering location
1	Nadarzynski et al. [15]	Qualitative study	Sexual health advice	Social media, University, HIV support and prevention charity
2	Gonsard et al. [12]	Qualitative and quantitative study	Children with asthma	Hospital
3	Richardson et al. [5]	Qualitative Study	Primary care visit	Large academic health center
4	Svendsen et al. [16]	Randomized controlled trial, Qualitative study	Low back pain	Hospital

5	Haan et al. [17]	Qualitative study	Radiology	University medical center
6	Tran et al. [13]	Qualitative and quantitative study	Diabetes, asthma, rheumatologic conditions, neurological disorders, and cancer	Community of Patients for Research, e-cohort
7	Couture et al. [18]	Qualitative and quantitative study	General	Social media, university
8	Aggarwal et al. [19]	Quantitative survey	Outpatient and inpatient in the last 12 weeks ago	Hospital
9	Fritsch et al. [20]	Quantitative survey	Patients for endoscopic procedure	Clinic
10	van der Zander et al. [21]	Quantitative survey	Gastrointestinal disorders	Hospital
11	Kim et al. [22]	Quantitative survey	Emergency inpatients	Hospital
12	Parry et al. [14]	Quantitative survey	Orthopedic surgery	Rural health system
13	Jutzi et al. [23]	Quantitative survey	Skin cancer	Hospital
14	Meyer et al. [24]	Quantitative survey	Users of the Isabel Symptom Checker	Clinic
15	Armero et al. [25]	Quantitative survey	Pregnant women	Hospital
16	Nadarzynski et al. [26]	Quantitative survey	Patients need to sexual health advice	Clinic
17	Yang et al. [27]	Quantitative survey	Cancer patients	Cancer center
18	Palmisciano et al. [28]	Quantitative survey \case-based design	Neurosurgery for brain tumors	Hospital
19	Kosan et al. [29]	Quantitative survey	Dental emergency patients	Clinic
20	Lee et al. [30]	Quantitative survey	Cancer patients	Hospital
21	Ayad et al. [31]	Quantitative survey	Dental patients	Clinic
22	Pellyet al. [32]	Qualitative study	Myocardial infarction patients	Cardiac health centers
23	Ibba et al. [33]	Quantitative survey	Radiology	Diagnostic clinic
24	Temple et al. [34]	Quantitative survey	Cancer patients receiving radiotherapy treatment	Cancer center
25	Pesapane et al. [35]	Quantitative survey	Breast cancer	Cancer center
26	Nelson et al. [36]	Qualitative study	Skin Cancer screening	Hospital

Note: Qualitative study: the studies performed using questionnaire; Quantitative survey: the studies conducted using interview

In a study on the users of the Isabel symptom checker in the US, Meyer et al. investigated the effectiveness or user experience of a specific symptom-checking AI tool among individuals in the US over a specified timeframe (24). Table 2 illustrates the study design, patients' participants, and data gathering location in identified papers.

Measurement aspects and variables

Figure 2 illustrates a detailed analysis of assessment factors and their presence in quantitative surveys focusing on users' perspectives on AI applications. The most prevalent factor identified was "previous exposure to AI," followed by "AI perception, advantages, and drawbacks" with a frequency of 5, and "privacy concerns and lack of trust" with a frequency of 4. In addition, other notable factors included AI acceptance, experience of AI diagnosis compared to healthcare providers, past usage of online healthcare tools, and AI knowledge, each with a frequency of 3.

Figure 3 depicts an overview of assessment factors and their occurrence in qualitative surveys regarding users' opinions on AI applications. The most common factors were knowledge of AI and barriers to AI usage, each with a frequency of 3, followed by AI benefits, previous experience with AI, AI usage facilitators, and opinions on AI disease management, each with a frequency of 2. As shown in Chart 1, the most frequent baseline characteristics in the identified paper were age and gender, followed by education level and ethnicity. The details of evaluation scopes in each identified paper are illustrated in Table 3.

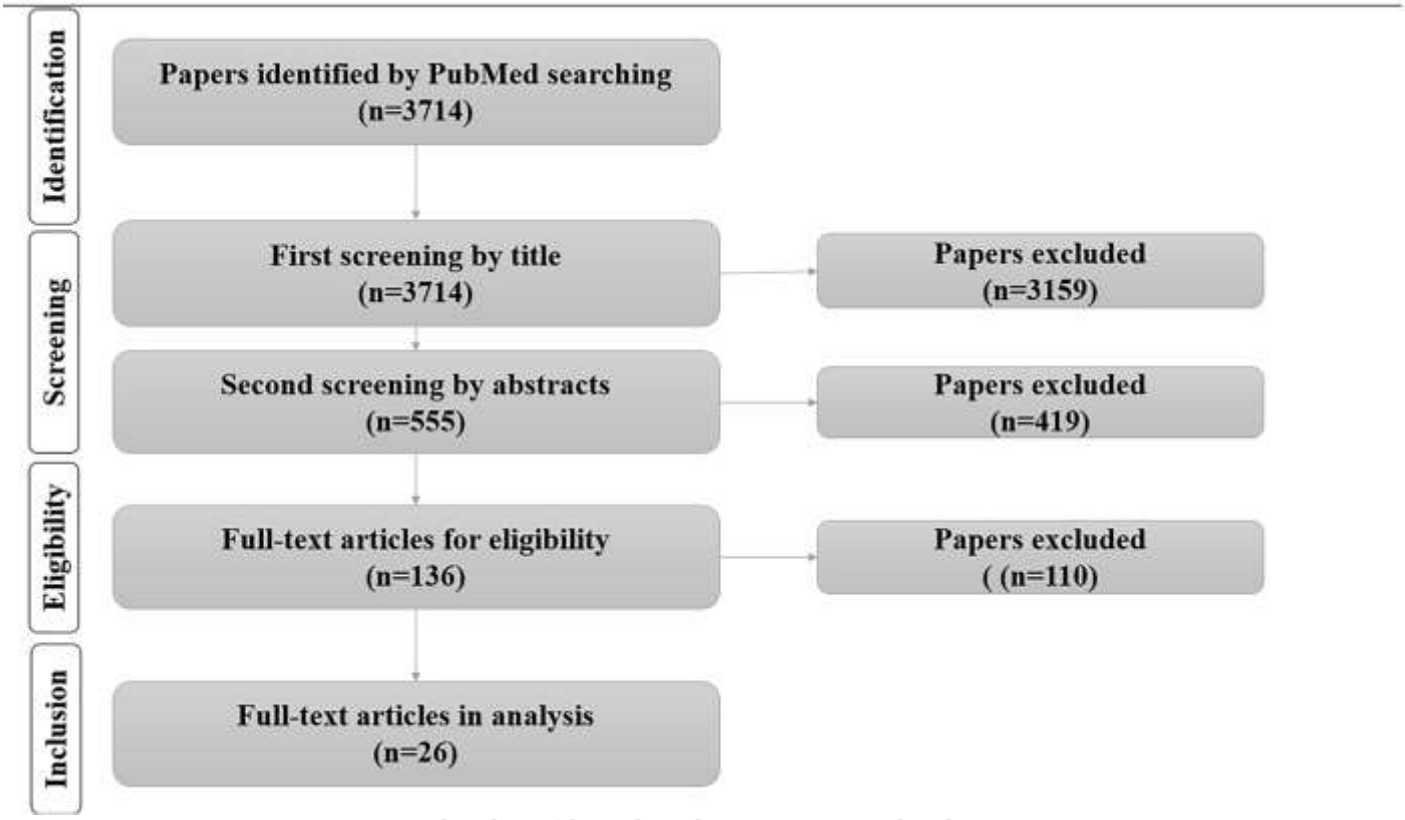

Figure 1. Flow chart of the studies selection process in PubMed

AI perspective or attitude[3]	AI perception, advantages, and disadvantages[5]	Change in the patient's perception after using AI health care [1]		AI acceptance[3]
AI healthcare usage[1]	Awareness of using health data for research[1]	Privacy, concerns, distrust[4]	Being Informed of AI usage[1]	Experience of AI error in diagnosis[1]
Patient satisfaction[1]	Reasons for using health care AI[1]		Healthcare cost[1]	Previous experience of using AI[7]
Willingness to use AI [1]	Technical affinity [1]	AI knowledge[3]	Knowledge about healthcare providers [1]	Previous experience using online tools in healthcare
Quality of care with AI[1]	Efficiency of AI[1]	Reliability of AI in diagnostics[2]		Experience of AI diagnosis compare to healthcare provider[3]
				Competence[1]

Figure 2: Evaluation factors in quantitative surveys focusing on users' perspectives on AI applications

AI usage facilitators[2]	AI usage Barriers[3]	AI Benefits[2]	AI Risks[1]	AI Concerns[1]	AI Strengths[1]
Knowledge of AI[3]	AI Adoption[1]	AI attitude[1]		Opinions on AI disease management[2]	Ethical challenges[1]
Previous experience of using AI[2]					Accountability[1]
Previous usage and type tools of e-health or m-health[1]	AI perception[1]	AI beliefs[1]		AI engagement[1]	Trust[1]

Figure 3. Evaluation factors in qualitative surveys focusing on users' perspectives on artificial intelligence applications

5. Discussion

The current systematic review examined the key insights gleaned from a comprehensive analysis of the research approaches, geographical representation, publication year distribution, user

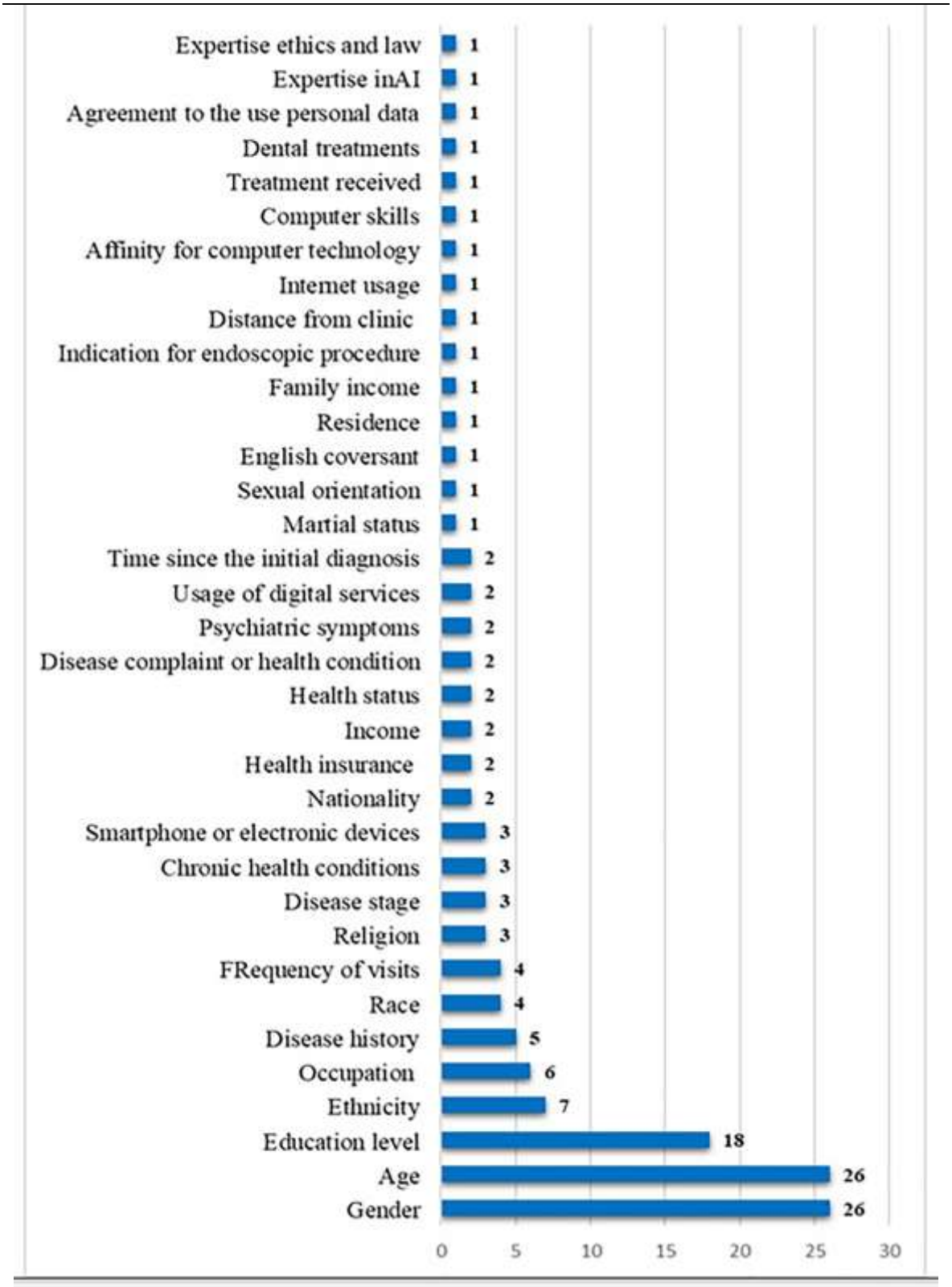

Chart 1. Frequency of baseline characteristics in identified papers

Table 3. Evaluation scopes in identified papers

Row	Authors	Evaluation scopes
1	Nadarzynski et al. [15]	AI facilitators and barriers
2	Gonsard et al. [12]	AI opinion in asthma management, advantages, disadvantages, and concerns of using AI
3	Richardson et al. [5]	Belief and attitude toward AI in healthcare
4	Svendsen et al. [16]	Facilitators and Barriers to usage AI
5	Haan et al. [17]	Proof of technology, AI knowledge, competence, efficiency, provider and patient interaction, and accountability
6	Tran et al. [13]	Barriers to the usage of AI, knowledge of AI, previous use, and type of e-health or m-health tools
7	Couture et al. [18]	Ethical challenges, AI benefits in disease management, engagement, previous experience of using AI
8	Aggarwal et al. [19]	Awareness of health data usage for research, perspective on data sharing, consent, and anonymization, perspective on AI, and health statuses
9	Fritsch et al. [20]	Technical affinity, perception of artificial intelligence in healthcare
10	van der Zander et al. [21]	Years of use of AI, quality of care with AI, willingness of AI use
11	Kim et al. [22]	Previous AI knowledge and attitude, automatic recording acceptance
12	Parry et al. [14]	AI in orthopedic care, healthcare cost, and the decision to refuse healthcare if cost increased
13	Jutzi et al. [23]	Attitude on AI
14	Meyer et al. [24]	Symptom checker use, experience of an error in diagnosis, and discussing symptom checker results with doctors
15	Armero et al. [25]	Patient's knowledge about the health care providers and AI, digital health scenarios, advantages and disadvantages of AI
16	Nadarzynski et al. [26]	Technology usage, utilizing a sexual health app for advice, ensuring the security of digital health records, and the preferred mode of receiving initial sexual health guidance
17	Yang et al. [27]	The reliability of AI in diagnostics, therapeutics, and prognostics, the credibility of advice from AI systems compared to oncology physicians, the main reasons for the choice, and the advantages and disadvantages of AI
18	Palmisciano et al. [28]	Role of AI platforms, AI acceptance, treatment, and surgery supported by AI
19	Kosan et al. [29]	See, believe, understand, trust, feel informed, feel unable
20	Lee et al. [30]	Use of Wearable devices for monitoring and feedback, the difference between general treatment methods and those supported by AI, change in the patient's perception of the hospital after receiving AI-based treatment, patient satisfaction, and reliability of treatment methods
21	Ayad et al. [31]	AI usage concerns and advantages, procedural knowledge, competence, efficiency, personal interaction, procedural knowledge, accountability, proof of technology
22	Pellyet al. [32]	Trust, expected capability, AI adoption, concerns experience, confidentiality, AI benefits
23	Ibba et al. [33]	AI knowledge, AI perceptions in diagnosis
24	Temple et al. [34]	Distrust and accountability of AI, procedural knowledge of AI, personal Interaction with AI, efficiency of AI, Being informed of AI in radiotherapy
25	Pesapane et al. [35]	AI knowledge, AI perception in breast screening mammography
26	Nelson et al. [36]	AI concept, AI benefits, AI risks, AI strengths

perspectives on AI applications in healthcare, and baseline characteristics of study participants. These multifaceted factors provide valuable insights into the factors that affect stakeholders' willingness to engage with AI technologies - a crucial consideration in shaping the future of AI-powered healthcare. In general, the research methodologies employed in studies of AI and record management systems provide valuable insights, informing the interpretation of the findings and guiding future research in the healthcare area (37).

The data-gathering methods used were primarily paper-based questionnaires and a combination of paper-based and web-based questionnaires, reflecting the common quantitative research approach of efficiently collecting data from a larger number of participants (38). Qualitative studies utilized semi-structured interviews to gather rich, contextual data. The majority of studies used quantitative surveys, while fewer relied on qualitative interviews. Moreover, a small proportion of studies adopted a mixed-methods approach, blending both qualitative and quantitative elements. This combination allows for a more comprehensive understanding by leveraging the strengths of different perspectives. Integrating mixed methods research has become crucial to contextualizing patient experiences and guiding stakeholder understanding. Given the complexity of AI, this rigorous, multifaceted approach is necessary to generate reliable findings that capture the diverse aspects of AI integration, from stakeholder perceptions to performance metrics (39, 40).

Another key factor of this review was the distribution of publication years among the identified papers, which provides valuable insights into the evolving research landscape. The data reflect a range of years represented, with a notable concentration in the most recent years of 2022 and 2023. Specifically, the results revealed an apparent trend towards increased publication activity in these later years. The papers published in 2022 and 2023 accounted for a significant majority. Bohr et al. indicated that in recent years, there have been an increasing number of research initiatives, technological advancements, and heightened attention to AI within the scientific community (41). On the contrary, the low representation of papers published in 2021 suggests

a potential lull or shift in research focus during that year. The possible reason behind this is the COVID-19 pandemic, which has affected research priorities and publication patterns. In times of crisis, such as epidemics, outbreaks, natural or man-made disasters, or when patients are unable to physically access healthcare facilities, the need for remote healthcare solutions becomes paramount (42).

The results revealed that the identified papers had a diverse geographical representation, with a notable concentration from the UK and USA. In the last few years, the development and deployment of AI have grown dramatically at a global scale. The USA is at the forefront of research in the topic area and has established strong research ecosystems and collaborations (43). Furthermore, the significant representation from European countries, such as Germany, France, Italy, and the Netherlands, suggests that this research area may have solid roots and ongoing contributions from the European scientific community. Meszaros et al. investigated the future regulation of AI systems in healthcare services and medical research in the European Union. The stated study presented a valuable opportunity for researchers to help shape what is poised to become one of the world's most comprehensive sets of laws and regulations governing AI (43-45). Overall, the examination of baseline characteristics, such as age, education level, and ethnicity, provides valuable insights into the factors that shape an individual's willingness to engage with AI-based healthcare solutions. These insights can inform targeted strategies and interventions to enhance the accessibility and adoption of these technologies across diverse patient populations. Furthermore, this suggests that researchers have primarily focused on these demographic factors when evaluating user perspectives on AI-based healthcare solutions. Further examination of these baseline variables provides additional insights. For instance, Robertson et al. indicated that older respondents had significantly lower odds of choosing an AI provider, with a year-by-year effect. On the other hand, the odds of selecting an AI-based healthcare solution increased with each one-unit increase in education level (46). Moreover, the study by Young et al. indicated that younger individuals and those with higher levels of education are more likely to be willing to choose and utilize AI-powered healthcare services (47). This aligns with the notion that familiarity and comfort with technology may play a role in the uptake of AI-based solutions. In addition, the data revealed differences in AI provider selection across various ethnic groups. Fritsch et al. concluded that White, Hispanic, and Asian participants were more likely to choose AI providers compared to other ethnic categories (48).

Finally, our findings revealed several key factors related to AI issues that were commonly assessed. The frequently assessed factors include "previous exposure to AI," "AI perception, advantages, and drawbacks," "privacy concerns and lack of trust," "AI acceptance," "experience of AI diagnosis compared to healthcare providers," "barriers to AI usage," "AI benefits," "AI usage facilitators," and "opinions on AI disease management." The most prevalent factor was "previous exposure to AI," indicating a strong emphasis on understanding users' familiarity and prior experience with AI technologies. This is an important consideration highlighted in previous studies, as it can affect perceptions, acceptance, and expectations of AI-based healthcare solutions. Understanding this prior experience and familiarity can provide valuable insights into the factors that influence individuals' attitudes, trust, and willingness to adopt these technologies within the healthcare domain (49, 50). In a similar vein, Jocelyn Chew et al. pointed out that by holistically addressing accessibility, knowledge, and user experience aspects, healthcare systems can create an environment that is more informed, engaged, and receptive to the integration and adoption of AI-powered solutions. This multifaceted approach is essential for unlocking the full potential of AI in transforming and enhancing healthcare delivery for the benefit of patients and healthcare providers (51).

6. Conclusion

This comprehensive literature review offers crucial insights into the factors shaping patient perspectives on the integration of AI in healthcare. This review revealed that demographic characteristics, such as age and education level, as well as attitudinal variables, including trust in AI and political orientation, play a pivotal role in determining an individual's willingness to utilize AI-powered healthcare solutions. Furthermore, the findings highlighted the need to address knowledge deficits regarding AI capabilities among both the general public and healthcare stakeholders through targeted educational initiatives. By understanding the complex interplay between human factors and the acceptance of transformative AI technologies, researchers and policymakers can develop more effective strategies to facilitate the seamless integration of AI-powered solutions, enabling the healthcare sector to harness the full potential of this revolutionary technology in the improvement of patient outcomes and service delivery.

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Conflicts of interest

The authors declare no conflict of interest.

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