International Journal of Health Sciences and Research
[Indexed, Peer-Reviewed Journal]
Volume 16; Issue: 9; September 2026
Website: www.ijhsr.org
Review Article *ISSN: 2249-9571*

Healthcare Workers' Perceptions of eHealth Implementation: Evidence from Systematic Review Methods

John Dery[1], Gabriel Sunday Oladipo[2], Elsie Ososese Ugege[3], Ulunma Ikwuoma Mariere[4]

[1]Department of Midwifery and Child Health Nursing, African Centre of Excellence for Public Health and Toxicological Research (ACE-PUTOR), University of Port Harcourt, Nigeria
[2]Department of Anatomy, African Centre of Excellence for Public Health and Toxicological Research (ACE-PUTOR), University of Port Harcourt, Nigeria
[3]Department of Public Health, African Centre of Excellence for Public Health and Toxicological Research (ACE-PUTOR), University of Port Harcourt, Nigeria
[4]Department of Community Medicine & Public Health, Bayelsa Medical University, Nigeria

Corresponding Author: John Dery

DOI: https://doi.org/10.52403/ijhsr.20260921

Received: 05/01/2026; Revised: 29/07/2026; Accepted: 14/09/2026

ABSTRACT

Background: The world of healthcare is increasingly adopting electronic health (eHealth) technologies as part of enhancing the quality of healthcare services. The success of its implementation is highly determined by the way in which health professionals perceive and embrace such systems. Regardless of this increased adoption, eHealth services are viewed differently by healthcare workers. The purpose of this review was to synthesise the perceptions of healthcare workers regarding eHealth implementation in various health settings.
Methods: PubMed, Scopus, and Google Scholar online databases were searched to find articles that were published between 2019 and 2024. It was reviewed based on the guidelines of Preferred Reporting Items of Systematic Review and Meta-Analyses (PRISMA). For the search strategy, the Population Exposure Outcome (PEO) was utilised. Studies were selected against the set inclusion criteria. Appraisal tool for cross-sectional studies, and good reporting of a mixed methods study tools were used for critical appraisals. Given the methodological heterogeneity, synthesis of findings was done narratively.
Results: Of 529 records, 13 studies met the inclusion criteria, representing 7,210 healthcare workers in ten countries. Most studies used quantitative cross-sectional descriptive designs. Healthcare workers believed eHealth improved communication, workflow efficiency, information access, and care coordination. However, inadequate training, poor internet connectivity, and organisational barriers were reported.
Conclusion: Healthcare workers had favourable perception of eHealth and acknowledged its potential to improve healthcare. Future research should use mixed-methods and longitudinal designs to capture changing attitudes across health system settings, and whether positive views lead to sustained eHealth system use.

Keywords: Electronic health records, eHealth implementation, telemedicine, healthcare workers, perceptions, attitudes

INTRODUCTION

eHealth is rapidly transforming contemporary healthcare by positioning eHealth tools at the core of service planning, delivery, and monitoring [1]. eHealth refers to a wide range of information and communication technologies, such as electronic health records, mobile health applications, telemedicine platforms and tools for remote monitoring of patients to enhance healthcare delivery [2]. These technologies aim to streamline clinical operations, enhance treatment, and increase healthcare access [2]. Globally, evidence from [3] and [4] indicates that eHealth tools enhance healthcare workers communication, make recording easier, and help make clinical decisions- especially in rural and underserved areas. As a result, governments and health systems around the world are allocating resources to eHealth to enhance health system efficacy and responsiveness [1]. Healthcare personnel, who integrate eHealth technology into clinical practice, are crucial to eHealth implementation success and therefore, their views, experiences, and preparation influence its implementation success [5]. Negative views may cause resistance, underuse, or implementation failure, whereas positive perceptions can help workflow integration [6]. Despite the benefits of eHealth, healthcare workers continue to cite usability issues, increased effort, insufficient training, and data security problems [7–10]. For example, Low- and middle-income nations still face structural restrictions such as insufficient information and technology (IT) infrastructure, restricted investment, unstable internet access, and low eHealth knowledge [11], while in high-income countries, health professionals cited eHealth systems being poorly linked with clinical workflows, adoption without stakeholder participation, implementation without training and organisational support challenges [12]. Undoubtedly, the COVID-19 pandemic has advanced worldwide adoption of eHealth technologies since telemedicine, mobile health, and virtual communication tools were needed for continuity of treatment and infection control. This quick adoption showed that eHealth potentially might improve healthcare delivery during the crises, however, it also revealed continuing inequities and highlighted the need for more sustainable, well-planned eHealth policies [13, 14]. The perspectives of healthcare workers during and after the pandemic can provide significant insights into the advantages and constraints of eHealth adoption amid real-world challenges [15]. But despite increased empirical studies on eHealth, evidence on healthcare workers' opinions of its implementation is dispersed across health system settings/contexts, study designs, and technology modalities. A full synthesis of peer reviewed articles is needed to explain current healthcare workers' perceptions, identify facilitators and challenges, and advise future implementation. Therefore, this review aimed to synthesise empirical evidence from 2019 to 2024 to answer the review question: What were healthcare workers perceptions about eHealth implementation across healthcare settings?

MATERIALS & METHODS

Study Design: The review design was based on the Preferred Reporting Items of Systematic Reviews and Meta-Analyses 2020 guidelines so that methods were clear, consistent and repeatable. The study process comprised inclusion criterion, data sources and search strategy; and screening, selection of eligible studies, data extraction criterion, and critical appraisal of the methodological quality; each of the review process is predefined and detailed.

***Study Inclusion Criterion*:** The inclusion criteria were outlined according to the study population, the object of study, the

methodologic design, the publication date, language and the original empirical studies that focused directly on the perception of healthcare workers regarding the eHealth implementation. Table 1 presents eligibility criteria for the study.

Table 1: Eligibility criteria

Inclusion	Exclusion
Examined healthcare workers' perceptions, experiences, or attitudes toward implemented eHealth systems	Focused exclusively on patients, caregivers, students, or non-healthcare professionals
Reported original empirical data,	Review papers, editorials, commentaries, conference abstracts, or opinion pieces
Employed qualitative, quantitative, mixed-methods, or systematic review designs	Protocols, theoretical papers, or publications without primary data
Published in English between 2019 and 2024	Studies published outside the specified period, unless providing essential historical context

Data Source: The three electronic databases (PubMed, Scopus, and Google Scholar) were chosen as they provide the opportunity to cover a large number of peer-reviewed studies that discuss the perceptions of eHealth implementation among healthcare workers in various healthcare environments. The search was conducted in the period between 5 December 2024 and 20 April 2025 to find recent evidence that would reflect current eHealth implementation contexts; only studies published between 2019 and 2024 were included as eligible.

Search Terms and Search Strategy: PEO framework was employed to make sure that the review objective was met. This framework informed the selection of keywords in the areas connected with the healthcare workers (population), eHealth implementation (exposure), and perceptions of eHealth implementation (outcome). To find the necessary studies, Medical Subject Headings (MeSH), free-text keywords, Boolean operator ("OR", "AND") and truncation characters (*) were used to merge words and obtain word variations and alternative endings. The population was inclusive of healthcare workers, namely, healthcare personnel, healthcare professionals, pharmacists, nurses/ midwives, doctors, physicians, allied health professionals, medical staff and nursing staff. The exposure was on eHealth technologies including telehealth, telemedicine, electronic health records, health information technology, and health information systems. The object of interest focused on the perceptions of healthcare workers regarding the implementation of eHealth, and included-attitudes, views, opinions, acceptability, and perspectives. The search terms were modified to suit differences in the indexing of database where appropriate, while ensuring similarity between searches. Database-specific search strategies were developed to reflect variations in search functionalities and indexing systems. In PubMed, searches combined MeSH terms and free-text keywords related to healthcare personnel, eHealth technologies, and perceptual outcomes. In Scopus, keyword-based searches using equivalent terminology were applied. For Google Scholar, a simplified keyword strategy was employed to identify additional relevant literature not indexed in traditional biomedical databases.

The search strings applied in each database were as follows:

PubMed: ("Health Personnel" [MeSH] OR "healthcare workers" OR "nurses" OR "doctors" OR "medical professionals") AND ("Telemedicine" [MeSH] OR "eHealth" OR "electronic health records") AND ("Attitude of Health Personnel" [MeSH] OR perception* OR attitude* OR acceptability OR perspective*).

Scopus: ("healthcare workers" OR "health personnel" OR "healthcare professionals" OR "nurses" OR "doctors") AND ("eHealth" OR "telehealth" OR "electronic health records") AND ("perception*" OR "attitude*" OR "opinion*" OR "acceptability" OR "perspective*")
Google Scholar: "healthcare workers" AND ("eHealth" OR "telemedicine") AND ("perception*" OR "attitude" OR "acceptability"). The search strategy was piloted to assess sensitivity and precision prior to final implementation. Table 2 presents details of the database-specific search strings to enhance transparency and reproducibility.

Table 2: Details of PubMed search strategy string

Database	Keywords	Limits/filters applied	Search dates
PubMed	("Health Personnel"[MeSH] OR "healthcare workers" OR "healthcare providers" OR "nurses" OR "doctors" OR "physicians" OR "allied healthcare workers") AND ("Telemedicine"[MeSH] OR "eHealth" OR "eHealth" OR "telehealth" OR "electronic health records" OR "health information technology") AND ("Attitude of Health Personnel"[MeSH] OR "perception*" OR "attitude*" OR "opinion*" OR "view*" OR "acceptability" OR "perspective*")	English, Human subjects, 2019–2024	Dec 5, 2024 – Apr 20, 2025

Selection Process: We had a total of 529 records on our search in the databases and after the data management procedures in Microsoft Excel, we were able to discover and delete 9 copy records, hence we had 520 records to screen. The titles were first screened and as a result, 375 records were excluded, which were obviously unrelated to the focus of the review, remaining 145 reports. All the 145 reports were retrieved, with zero (0) reports not retrieved. The 145 reports underwent an abstract and full-text screen, with 132 reports being eliminated on the basis of not meeting the study inclusion criteria; of these, 90 reports were published not within the period, 2019-2024, 39 reports were not focused on the objective of the review, and 3 reports were case studies. After this screening, 13 reports met the inclusion criteria and were selected to be included in the final review. The selection of the study was performed based on the PRISMA model represented in Figure 1.

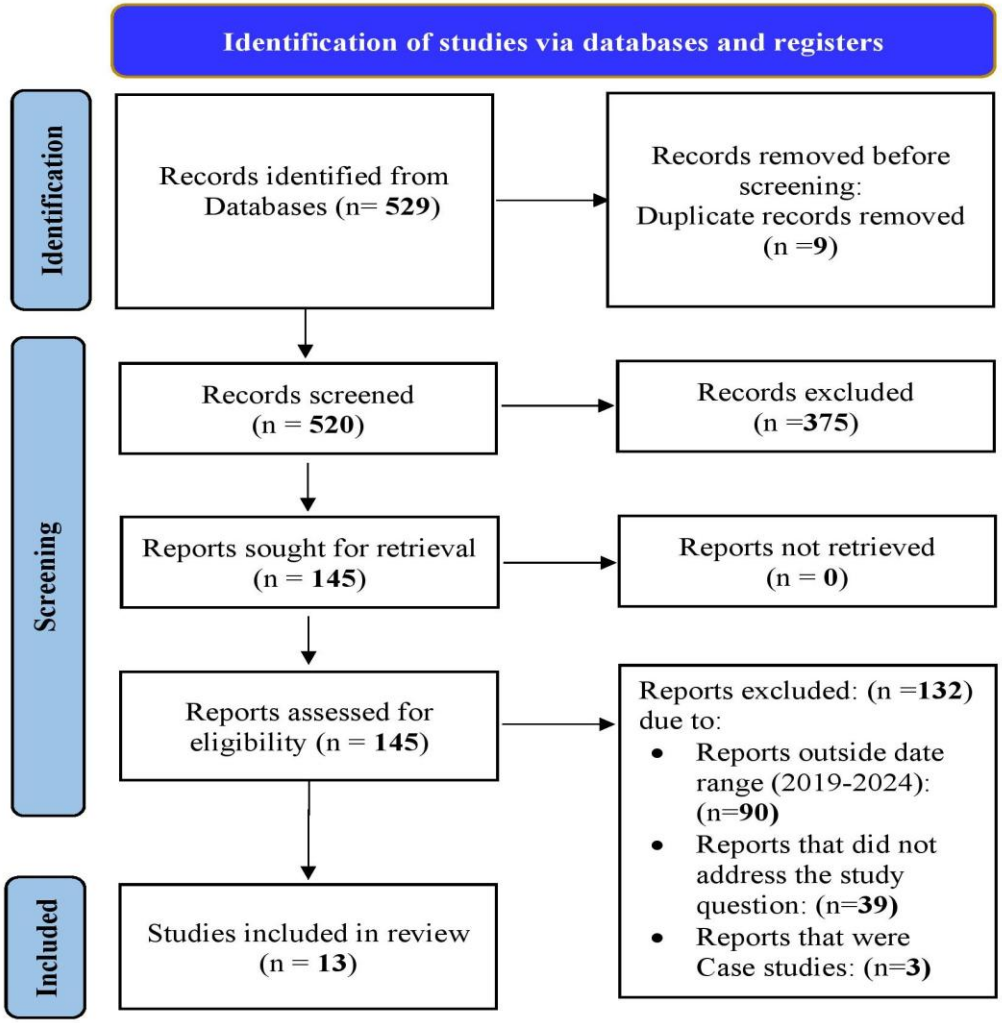

Figure 1: The study selection process conducted in accordance with PRISMA model for the systematic review

This systematic review was recorded in the the International Prospective Register of Systematic Reviews (PROSPERO) under the registration number CRD420251164992. https://www.crd.york.ac.uk/PROSPERO/view/CRD420251164992.

Data Extraction: The characteristics of the study were entered into a template made in a Microsoft Excel. It was piloted afterward prior to the extraction of full data to make it clear, consistent, and properly recorded information on study characteristics. Data extracted were researchers of the study, study title, date of publication, study design, sample size, main results, conclusions, limitations given, and reflection of contextual or confounding variables as reported (including COVID-19 pandemic). Supervision and validation of this extraction was done by supervisors to ensure that this extraction was accurate and complete to increase reliability and reduce chances of data extracted errors. Table 3 gives a summary of the extracted study characteristics.

Table 3: Summary of Data Extraction from Selected Studies on Healthcare Workers' perceptions on eHealth Implementation

SN0	Authors	Study title	Publication year	Country	Study Design	Sample size	Key findings	Conclusions	Limitations	Control for COVID-19
1	Petrov al. (2023)	Healthcare professionals' knowledge, perceptions, and attitudes toward eHealth across 14 hospitals in Bulgaria.	2023	Bulgaria	Quantitative cross-sectional descriptive study (self-administered questionnaire)	1187	75% of respondents were sceptical about eHealth implementation.	While health professionals widely recognise the benefits of eHealth, concerns persist regarding its practical implementation and patient accessibility.	Potential response bias due to supervisor-mediated distribution of questionnaire	Data were collected pre-covid period
2	Guillari et al. (2024)	Evaluation of nurses' knowledge, attitudes, and practices related to eHealth in Naples.	2024	Naples	Quantitative cross-sectional descriptive study (self-administered questionnaire)	480	Nurses' eHealth literacy corresponded with more positive attitudes	Nurses have positive attitudes toward eHealth.	Limited generalisability due to restriction to a single professional category	Yes
3	Kumar et al. (2022)	Healthcare workers' understanding	2022	Pakistan	Quantitative cross-sectional	212	Positive perceptions of	Healthcare providers view telemedicine	Limited causal inference and generalisabilit	Yes

		and perspectives on telemedicine in rural Sindh.			descriptive study (self-administered questionnaire)		telemedicine were observed among participants.	positively.	y.	
4	Androni c et al. (2023)	Healthcare Professionals' Specialists' Perception of Telemedicine: A Study of Beliefs, Practices, and Expectations	2023	Romania	Quantitative cross-sectional descriptive study (online survey)	1017	Majority (52.1%) strongly viewed telemedicine as important.	Health professionals expressed positive perceptions of eHealth for effectiveness and access.	Sample gender imbalance and online survey use may limit validity.	Yes
5	Wernhat et al. (2019)	eHealth and telemedicine: Practices and beliefs among healthcare professionals and medical students at a medical university	2019	Austria	Descriptive mixed-methods study (online survey and content analysis)	905	Participants remained sceptical about internet-based sources.	HCWs generally indicated negative perceptions and low acceptability of eHealth.	Single academic setting limits generalisabilit y to other healthcare contexts.	No
6	Bashir et al. (2023)	Health care professionals' knowledge and attitudes toward telemedicine	2023	Saudi Arabia	Quantitative cross-sectional descriptive study (self-administered questionnaire)	370	HCWs generally have positive attitudes despite limited information.	HCWs have positive perceptions with variation across professional groups.	Limit causal inferences.	Yes
7	Walle et al. (2024)	Attitudes of healthcare professionals toward mobile	2024	Ethiopia	Quantitative cross-sectional descriptive	422	HCWs favourable attitudes were associated	HCWs generally have favourable attitudes	Study design precludes causal inference.	No

		health technology and in a resource-constrained setting.			study (self-administered questionnaire)		with perceived advantages.	towards mobile health technologies		
8	Alghamdi et al., (2022)	Perceptions of healthcare providers and the challenges they face in using telehealth	2022	Saudi Arabia	Quantitative cross-sectional descriptive study (self-administered questionnaire)	1034	Telemedicine seen as beneficial for access by 44% of respondents.	HCWs expressed diverse perceptions regarding telemedicine's benefits for access.	Study design may limit causal inference.	Yes
9	Boadu et al. (2024)	Healthcare professionals' views on utilising health information applications in Cape Coast health facilities.	2024	Ghana	Quantitative cross-sectional descriptive study (self-administered questionnaire)	632	HCWs have favourable perspectives toward health information technology were reported.	HCWs have positive views of health information technology and its perceived importance in healthcare delivery.	The cross-sectional design limited the scope and depth of analysis.	No
10	Owoeye et al. (2022)	Health workers' perceptions, and use of eHealth in Benin City.	2023	Nigeria	Quantitative cross sectional descriptive study (self-administered questionnaire)	340	HCWs have high awarene ss level (96.2%) with moderat e eHealth use (63.5%)	Health workers showed positive perceptions of eHealth services	Potential social desirability bias due to self-reported measures.	No
11	Takuwa et al. (2023)	Knowledge, attitudes, and perceptions of health workers regarding mobile health	2023	Uganda	Quantitative cross-sectional descriptive study (self-administered	87	High interest in mHealth was observed despite existing challenges	HCWs indicated positive mHealth perceptions despite	Self-reporting bias and small sample size limited the strength of the findings.	Yes

		access and use.			questionnaire)		among health workers	implementation barriers.		
12	Okronipa et al. (2023)	Perspectives of health professionals regarding the utilisation of HIS for clinical and administrative tasks.	2023	Ghana	Quantitative cross-sectional descriptive study (self-administered questionnaire)	80	The majority of healthcare professionals Health have favourable perceptions towards Health Information Systems.	HCWs widely perceived eHealth as an effective and useful tool.	Limited sample size and methodological challenges weakened result robustness.	No
13	Nagaraja et al. (2024)	Doctors' perspectives on the utilisation of telemedicine: findings from a cross-sectional study.	2024	India	Quantitative cross-sectional descriptive study (internet-based survey)	444	Most doctors (80%) reported that the recommendations improved telemedicine procedures.	Doctors viewed telemedicine as favourable in India's telemedicine practice.		yes

Quality Assessment: We evaluated the quality of the methodology of the chosen studies based on their designs. Appraisal Tool for Cross-Sectional Studies (AXIS) was used to determine the quality of the cross-sectional studies and the Good Reporting of A Mixed Methods Study (GRAMMS) framework to determine the quality of the mixed-methods study. These design-specific appraisal tools were found to offer a systematic and suitable standard of assessment of the incorporated studies that ensured that both the strengths and limitations with regards to methodological approaches were taken into consideration to synthesis of evidence.

AXIS Tool Assessment: The AXIS is a methodology-specific tool that is used to determine the quality of cross-sectional studies **[16]**, and this systematically evaluated the studies included in the review based on aims and objectives, methods, results, discussion and others sections. In order to understand how well each study has been conducted, we rated its respective AXIS items. We awarded 1 point on a Yes answer, 0.5 points on unclear and partially answered item and 0 points on a No answer. The scoring system gave a total of a maximum of 20 points to each of the studies. We then put these studies in three categories of quality according to set thresholds **[17]**. High quality of studies with a total score of 14-20, which is ≥70% of the possible maximum score, Moderate quality-studies with a score of 10-13, which is 60-69.9%. and Low quality-studies with a score of below 10 which was less than 60% of the possible maximum score. Among the 12 available cross-sectional studies selected, 8 of them were rated as high quality **[3, 10, 18-23]** and the other four studies

were rated as moderate quality [24-27]. None of the studies was considered as low-quality. An overview of the AXIS quality appraisal outcomes is indicated in Table 4.

Table 4: Summary of AXIS tool appraisal scores (Cross-Sectional studies)

AUTHORS OF RECORDS											
Petrov al. (2023)	**Guillari et al. (2024)**	**Kumar et al., (2022)**	**Andronic et al., (2023)**	**Bashir et al. (2023)**	**Walle et al. (2024)**	**Alghamdi et al., (2022)**	**Boadu et al. (2024)**	**Owoeye et al. (2022)**	**Takuwa et al. (2023)**	**Okronipa et al. (2023)**	**Nagaraja et al. (2024)**
Introduction											
1	1	1	1	1	1	1	1	1	1	1	1
Methods											
1	1	1	1	1	1	1	1	1	1	1	1
0	1	1	0.5	1	1	0	0.5	1	0	0	0.5
1	1	1	1	1	1	1	1	1	1	1	1
0.5	1	1	0.5	1	1	1	1	1	1	0.5	0.5
0.5	1	0.5	0.5	1	1	0.5	0.5	0.5	1	0	0.5
0	0.5	0.5	0	0.5	0.5	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1
0.5	1	1	0	1	1	1	1	1	0.5	0.5	1
1	1	1	1	1	1	1	1	1	0	0.5	1
1	1	1	0.5	1	1	1	1	1	0	0.5	0
Results											
1	1	1	1	1	1	1	1	1	1	1	1
0	1	1	0	0	0	0.5	0.5	0.5	0.5	0.5	1
0	0	0	0	0	0	0	0	0	0	0	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
Discussions											
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	0.5	1	1	1	1	1	1	0.5	1
Others											
0	0	0	0	0	0	0.5	0.5	0.5	0.5	1	1
0	1	1	1	1	1	1	1	1	1	1	0.5
Total= 12.5	17.5	17	12.5	16.5	16.5	15.5	16	16.5	13.5	13	18

GRAMMS Framework Assessment: We applied the Good Reporting of A Mixed Methods Study (GRAMMS) framework to appraise the reporting quality of the single mixed-methods study included in the review **[28]**, according to the six core reporting domains, which included justification for the mixed-methods design, clarity of methodological reporting, integration of qualitative and quantitative components, and coherence between study objectives, methods, and findings **[29]**. The included study demonstrated moderate to strong reporting quality across the assessed domains. A summary of the GRAMMS appraisal results is presented in Table 5.

Table 5: GRAMMS assessment of the included mixed-methods study

GRAMMS Criterion	Rating
1.Justification for mixed methods design	Strong
2.Design Description	Moderate
3.Method description	Strong
4.Integration process	Moderate
5.Insights from integration	Present
6. Limitations of integration	Absent

RESULT

*Study Selection***:** The PubMed, Scopus, and Google Scholar search resulted in 529 records that were screened, 9 articles were eliminated as duplicates, leaving 520 records. Title screening of articles that are irrelevant to the topic of the review process led to elimination of 375 records and 145 articles were to be screened in terms of abstract and full-text screening. In this process, 132 studies were excluded based on the following reasons; 90 articles were published earlier than the established period of review (2019-2024), 39 articles were not relevant to the objective of the review, and 3 articles were taken out due to the limitation of the methodology (case studies). PRISMA flow diagram demonstrates the process of selection of the study (See figure 1).

Features of the 13 Studies: The 13 included reports included 12 quantitative cross-sectional descriptive studies and one mixed-methods study, which disclosed the popularity of the design and methodology when it comes to estimating the perceptions of healthcare workers toward the implementation of eHealth. These works were published in peer-reviewed journal in the year 2019-2024 and demonstrate the recent evidence correspondence with eHealth implementation initiatives. The review was conducted in both the resourced and under resourced countries around the world, where the sample population comprised of nurses, physicians, and allied health professionals working in the primary healthcare. The reports included were different in terms of sample size, the setting, and scope of studies. Electronic health records, telemedicine systems, telehealth platforms, and more comprehensive health information systems were all considered the aspects of eHealth under consideration. In the studies that were included, the predominant focus was on the perception of the workers in the healthcare sector, their attitudes, the acceptability, and opinion on the use of these eHealth technologies in everyday clinical practice. Table 6 gives a comprehensive description of the reports, which indicates how many studies were used, in which countries they were conducted, the research strategy, the methodology, the sample size, the distribution of samples by the studies, and when they were conducted in reference to the COVID 19 pandemic.

Table 6: 13 included studies characteristics

Characteristics of included Studies	Summary of Details
Number of studies	Thirteen (13) reports were included in the review, all examining healthcare workers' perceptions of implemented eHealth systems.
Geographical settings	Bulgaria (1), Italy—Naples (1), Pakistan (1), Ethiopia (1), Romania (1), Austria (1), Saudi Arabia (2), Ghana (2), Nigeria (1), Uganda (1), India (1).
Study designs	Two designs were included: descriptive cross-sectional surveys (12/13) and mixed-methods (1/13).
Methodological approaches	Quantitative (12/13; 92.3%); mixed-methods (1/13; 7.7%); no purely qualitative study was included.
Sample sizes	Individual study sample sizes ranged from 80 to 1,187 participants; total participants across all included studies = 7,210.
Sample distribution by methods	Quantitative studies: 6,305 participants; mixed-methods study: 905 participants
Timing relative to COVID-19	Studies spanned pre-pandemic and during/post-pandemic periods (e.g. 25, 10, 21).

Data Synthesis: Synthesis of numerical data was done in a narrative way. This was appropriate with the diversity of the evidence base that had different study designs, healthcare settings, different groups of participants, and different outcomes. Instead of aggregating the findings, we analysed the studies in relation to each other to determine the recurring patterns and thematic areas of perception about eHealth implementation in healthcare workers. We classified the findings into themes, which enabled the systematic comparison of the included studies and contexts and maintained the specificity of the individual study outcomes.

Synthesis of Findings: Results of the review were synthesised incorporating 13 included reports, published between 2019 and 2024, and investigated the perceptions of eHealth implementation of healthcare workers in different countries, such as Bulgaria, Nigeria, Pakistan, Ethiopia, Ghana, India, Italy, Austria, and Saudi Arabia. The studies sample sizes were combined to a total of 7,210 sample population of healthcare workers, which have represented various health system settings with regard to the eHealth. The majority of studies adopted the cross-sectional designs, and only one utilised a mixed-method approach. The synthesis of findings was thematically done using four sections which captured perceived advantages of eHealth systems and the challenges affecting the implementation.

Theme 1: eHealth Implementation Perceived Value and Support.

Consequently, the overall perception of healthcare workers was positive, as they mentioned that they support the introduction of eHealth systems. As an example, the participants of India, Saudi Arabia, Pakistan, Romania, and Bulgaria tended to view eHealth technologies as tools beneficial in improving healthcare delivery, enhancing efficiency, and modernising clinical practice **[18,19,23,24,25,27]**. Equally, respondents in Austria and Romania also gave positive perceptions of eHealth implementation, despite some respondents indicating the issues related to patient usability, and implications of eHealth systems on daily clinical work **[24,25]**. Health care workers in Ghana and Nigeria expressed interest in adopting eHealth and saw its potential to enhance the process of care delivery, but, at the same time, noted infrastructural and organisational barriers that hindered the efficient use of the system **[18, 27]**. The COVID-19 pandemic was also often reported to trigger greater eHealth uptake in various situations. Some of the studies mentioned the pandemic as increasing the pace of eHealth implementation and decreasing resistance among healthcare professionals, especially in the

environments where previous implementation initiatives had been attaining low momentum due to scepticism or insufficient institutional backing [10,18,21,25,28].

Theme 2: Co-ordination of patient care

The eHealth systems were seen to increase the coordination and efficiency of patient care processes including facilitating easier communication between providers, the timely exchange of information and collaborative clinical decisions [21,23]. In environments where the geographical distance or the insufficient access to healthcare services and resources was present, eHealth technologies, specifically, electronic health records and telemedicine platforms were considered critical in enhancing resource availability and service accessibility [3,26]. These systems were said to simplify clinical processes, facilitate evidence-based practice, and foster multidisciplinary practice. Evidence of affluence and resource-limited nations further depicted how the eHealth had decreased the reliance on the paper-based records, enhanced the precision of the data, and interdisciplinary co-ordination [3,21]. Taken together, these cost-efficiencies were considered to be helpful to individual clinicians and healthcare teams because they led to consistency and reliability of clinical information at various points of care.

Theme 3: Organisation and Policy Restrictions

Some studies provided institutional and system level constraints limiting a success of eHealth implementation. Indicatively, a single investigation indicated that numerous interruptions in power, internet, Gaps in infrastructure Information and Communication Technology are compromised in eHealth systems' performance in Ethiopia [22]. Similar difficulties were reported in study in Ghana with regards to old equipment usage and unreliable network connection [27]. Lack of clear institutional policies and regulatory framework were also common reports. One study conducted in India established that despite the growing interest in eHealth, absence of clear institutional policies and failure to implement standardised national policies hampered implementation endeavours [19]. Similar results were also achieved in Nigeria, where the organisational capacity to maintain eHealth initiatives was seen to be limited by a lack of organisational commitment to leadership, and disjointed governance frameworks [20]. Findings between studies also found apprehension regarding the privacy of sensitive patient data in situations where lawful and regulatory safeguards were considered to be inadequate [20,22]. Overall, the findings have shown that infrastructural limitations, institutional preparedness, and regulatory differences were frequently cited factors that affected how eHealth systems are implemented and used.

Theme 4: Differences in eHealth Literacy

Geographical differences in the eHealth literacy and readiness between healthcare workers, in the high-income environment, showed that eHealth programs were majorly focused on improving the quality of services and user experience, with the developed digital infrastructure and developed eHealth systems [28]. Conversely, the information in low- and middle-income nations highlighted issues associated with low eHealth competence, low training, and unfamiliarity with systems among healthcare professionals [20,27]. As an example, low previous exposure and training opportunities were related to decreased confidence among healthcare workers in Nigeria [20]. In a similar study, reported to have been carried out in Ghana that the challenge faced was poor technological skills limiting effective use of eHealth platforms [27]. The mixed-methods study included also reported even lower levels of daily eHealth integration by healthcare professionals in the resource-constrained settings, especially in situations

where scarce training opportunities were reported **[28]**.

DISCUSSION

This systematic review examined the perception of healthcare workers regarding eHealth implementation in the different context of healthcare across the globe. On the general level, the results show that healthcare personnel are generally receptive to eHealth and recognises its ability to simplify clinical processes and enhance service operations. However, the positive perceptions were not equally converted to continued usage. It was also reported in studies that there was strong interest in the implementation of eHealth that was mainly due to perceived benefits in efficiency, communication and improved access to care. The degree of perceived benefits that may be obtained and maintained is however very much dependent on factors and some of them are availability of infrastructure, training potential, and institutional support. The said differences justify the necessity to approach the context of the health system as it interprets the perceptions of healthcare workers towards eHealth and evaluates the sustainability of its implementation **[18, 19, 23, 25]**. Austrian and Romanian healthcare workers, in their turn, share their doubts regarding the usability of eHealth systems, workload, and the long-term utilisation of eHealth systems and indicated a more restrained variant of optimism **[24, 25]**. The trends are also in line with previously conducted studies that confirmed a specific emphasis of healthcare professionals on the perceived usefulness and ease of use when working with new technologies **[30, 31]**. Moreover, the experience found in Ghana and Nigeria, which on the whole perceive eHealth positively, is slowed by ongoing infrastructural and structural level bottlenecks to its expectations **[20, 27]**. Such an observation is reflected in the evidence of low- and middle-income countries which shows that positive user perceptions alone do not necessarily translate into successful and or maintained eHealth implementation where inadequate infrastructural support exists **[32]**. The interest was more manifested in greater institutional preparedness in the developed nations as compared to the low-and middle-income nations where interest was more limited by structural constraints that had always existed. The findings in Ghana and Nigeria, specifically, indicated that the lack of opportunities to train and little previous exposure to eHealth technologies weakened their adoption in the everyday clinical practice **[27, 28]**. Such results support the current literature that the constraints of eHealth knowledge and labour force represent significant challenges to the sustainability of eHealth projects in the long term **[33]**. Conversely, there is evidence showing that the eHealth systems that are seen to be easy to learn have higher chances of a successful implementation with time**[34]**. Collectively, the results indicate that unless continued context-sensitive training is provided, the expected benefits of eHealth cannot be effectively achieved, even in those environments where healthcare workers are initially positive. The review also suggests that the acceptance and utilisation of eHealth systems by healthcare workers is greater when they find a sense of clinical value, such as through enhanced communication, lessening of task duplication and effective workflow clinical processes **[3, 21, 26]**, which are largely reliant on their perceived capacity to integrate into the continuum of normal clinical practice **[35]**. An analogous report based on a longitudinal study indicated that eHealth interventions incorporated in the daily working processes are likely to be maintained more than those that lead to work overload or administrative overhead on clinicians **[33]**. Nevertheless, despite these perceived advantages, there were institutional barriers that were still noticeable in a number of regions. Indicatively, research in Ethiopia, Ghana, and Nigeria indicated that outdated machines, poor internet connectivity, and poor information and communication

technology infrastructure were some factors that hindered the effective utilisation of the eHealth systems **[22,27]**. Besides, ineffective regulatory frameworks, inefficient governance systems, and organisational unpreparedness are still limiting the scale-up and long-term viability of eHealth projects as evidenced in Nigeria and India **[19,20]**. Cases of data security and patient confidentiality also contributed to the unwillingness of healthcare workers to adopt eHealth systems completely, especially in the areas where the legal safeguards were being viewed as ineffective **[22,36,37]**. The findings show that institutional readiness and regulatory certainty are the pillars towards maintenance of eHealth implementation. In most of the environments, the COVID-19 pandemic served as a booster to the implementation of eHealth. The review reports via empirical evidence that the utilisation of the eHealth systems was normalised among healthcare workers in attempts to ensure service delivery throughout the period **[21,24]**. Nevertheless, there are still reported issues regarding the sustainability of this fast, crisis-based growth. It has been shown that preserving pandemic-related benefits will necessitate long-term investment in infrastructure, enhanced labour capacity as well as post-pandemic policy realignment **[38,39]**. The review also focuses attention on regional variations in the priorities of eHealth preparedness and implementation. In high-income countries, the work is mostly focused on the quality of service and the experience of the user. Conversely, low- and middle-income nations still place the issues on their agenda such as infrastructural development, workforce capacity development, and the fair access to eHealth systems **[27,28]**. Saudi Arabian reports indicate that cultural requirements and professional position disparity play significant roles in enhancing interaction of healthcare workers with eHealth systems **[34,40]**. This is consistent with the available literature that indicates that eHealth programs in poor and middle-income nations are loosely scaled or die off when the local contextual assumptions like cultural norms, staff readiness, and infrastructure constraints are inadequately tackled. **[33,41]**.

Practice, Policy and Research Implications

Practically, health care organisations should focus on enhancing eHealth literacy by training, but in a systematic manner and within the framework of general staff training. Development of professionals is relevant to the development of confidence and competence of healthcare workers, which is essential to the introduction of eHealth technologies in clinical practice.

To policy, a rational eHealth policy with, medico-legal and regulatory frameworks in place to deal with issues of data privacy, data security, and data accountability. The organisational leadership commitment and institutional policies will presumably increase the trust of healthcare workers in eHealth systems and ensure the long-term implementation. Good internet connectivity, right hardware and robust information system on health are some of the core requirements of successful implementation of eHealth in different healthcare environments.

To researchers, this review implies that more detailed information on the perceptions of healthcare workers regarding the implementation of eHealth is required and should be produced by using mixed-methods and longitudinal research. These designs will enable a subtle consideration of the interaction of the organisational, contextual, and individual variables to affect the implementation of the eHealth systems. Besides that, comparative studies between high and low and middle-income settings are required to establish setting-specific facilitators and inhibitors, and thus, more context-sensitive and fairer methodologies of eHealth implementation.

Limitations and Strengths of the Study

Strengths

The chosen works of 2019 and 2024 reflect the up-to-date evidence, which shapes the modern policy discussion regarding the implementation of eHealth. These approaches were guided by a clear review purpose and complied with the PRISMA guidelines in order to guarantee the synthesis of results. Selection of the studies across various settings provided the construction of a meaningful contrast of evidence between the resource rich and resource limited countries. It is an across-study approach that is critical enough to explicate the difference in infrastructure, training and institutional readiness impact on the implementation of eHealth in contexts. An analytic narrative synthesis also enabled the combination of the findings of the studies with quite different methodologies, and thus the identification of common patterns in perceived benefits and implementation challenges became easier. Lastly, to give the synthesis credibility and transparency, the employment of established quality appraisal tools to systematically evaluate methodological rigour and the quality of the reporting, placed the conclusions in context to the quality of the evidence available to support it.

Limitations

First, the research findings were largely quantitative cross-sectional descriptive studies. This restricted our focus of investigating the causal relationship, changes in the course of time or the more profound contextual and experiential variations of eHealth implementation. Second, the heterogeneity of the settings, eHealth technologies, and outcome measures of the studies did not permit quantitative meta-analysis, and instead, narrative synthesis was employed, thus limiting the direct comparability of the results across the studies. Third, our search focused on the English-language literature that was published after 2019 and in selected databases, probably omitting earlier core studies, grey literature, policy documents, and data not related to English-speaking contexts, but current relevance and rigour of the research were ensured. Lastly, the methodological quality and reporting standards of the studies included in the review affect the conclusions made in the review-reported gaps in training, infrastructure, and governance might thus indicate a combination of actual problems with implementation as well as study design and reporting limitations.

CONCLUSION

This was a synthesis of evidence of the perceptions of healthcare workers regarding the implementation of eHealth in different environments. In most instances, eHealth implementation was perceived to be positive by healthcare workers who saw the possibility of providing better care to the patient, communication, access, and efficiency. However, all such favourable perceptions are highly dependent on organisational and contextual realities such as poor training, structural limitations, policy loopholes, and lack of institutional preparedness. In spite of the importance of positive perceptions of healthcare workers, the successful integration of eHealth involves organisational support, intentional investment, increased eHealth training, and creation of policy and medico-legal environment to secure the long-term use of eHealth. Another point expressed by the review is that since cross-sectional designs are predominantly quantitative, future research ought to adopt mixed-methods and longitudinal methodology to understand the idea of perceptions by healthcare workers, the development of perception, and the persistence of positive perception towards the eHealth system. Research in both high-income and low- and middle-income environments would also identify context-specific facilitators and barriers, which would support more effective and up-to-date eHealth implementation frameworks.

Declaration

Ethical Approval: Not applicable (systematic review of reported literature)
Acknowledgement: None
Source of Funding: None
Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. World Health Organisation. Global strategy on digital health 2020-2027. Geneva: World Health Organization: WHO; 2020.
2. da Fonseca MH, Kovaleski F, Picinin CT, Pedroso B, Rubbo P. E-health practices and technologies: A systematic review from 2014 to 2019. Healthc. 2021;9(9): 1192. doi: 10.3390/healthcare9091192.
3. Boadu RO, Adzakpah G, Mensah NK, Boadu KAO, Kissi J, Dziyaba C, et al. Healthcare providers' perception towards utilization of health information applications and its associated factors in healthcare delivery in health facilities in Cape Coast Metropolis, Ghana. PLoS One. 2024;19(2): e0297388. doi: 10.1371/journal.pone.0297388
4. World Health Organization Regional Office for Africa. Progress report on framework for implementing the Global strategy on digital health in the WHO African Region. Brazzaville: WHO Regional Office for Africa; 2024. Available from: https://www.afro.who.int/sites/default/files/2024-07/AFR-RC74-INF-DOC-3%20Progress%20report%20on%20the%20Framework%20for%20implementing%20the%20Global%20strategy%20on%20digital%20health%20in%20the%20WHO%20African%20Region.pdf
5. Agarwal S, Sripad P, Johnson C, Kirk K, Bellows B, Ana J, et al. A conceptual framework for measuring community health workforce performance within primary health care systems. Hum Resour Health. 2019;17(1):1–20. 86. doi: 10.1186/s12960-019-0422-0
6. Zhang N, Zhang N, Wang Y, Wong R, Ma K. Health Care Professionals' Perspectives on Technology Use in Urinary Care: Cross-Sectional Survey-Based Study. JMIR Form Res. 2025;9: e73453. doi: 10.2196/73453.
7. Norgaard O, Furstrand D, Klokker L, Karnoe A, Batterham R, Kayser L, et al. The e-health literacy framework: A conceptual framework for characterizing e-health users and their interaction with e-health systems. Knowl Manag E-Learning. 2015;7(4):522–40. doi: 10.34105/j.kmel.2015.07.035
8. Alanazi B, Butler-Henderson K, Alanazi MR. Factors Influencing Healthcare Professionals' Perception towards EHR/EMR Systems in Gulf Cooperation Council Countries: A Systematic Review. Oman Med J. 2020;35(6): e192. doi: 10.5001/omj.2020.85.
9. de Grood C, Raissi A, Kwon Y, Santana MJ. Adoption of e-health technology by physicians: a scoping review. J Multidiscip Healthc. 2016; 9:335–344. doi: 10.2147/JMDH.S103881
10. Bashir MS, Lalithabai DS, AlOtaiby S, Abu-Shaheen A. Health care professionals' knowledge and attitudes toward telemedicine. Front. Public Health. 2023; 11:957681. doi: 10.3389/fpubh.2023.957681
11. Abimbola S, Keelan S, Everett M, Casburn K, Mitchell M, Burchfield K, et al. The medium, the message and the measure: A theory-driven review on the value of telehealth as a patient-facing digital health innovation. Health Econ Rev. 2019; 9(1):21. doi: 10.1186/s13561-019-0239-5.
12. Ross J, Stevenson F, Lau R, Murray E. Factors that influence the implementation of e-health: A systematic review of systematic reviews (an update). Implement Sci. 2016;11(1):146. doi: 10.1186/s13012-016-0510-7.
13. Iyengar K, Upadhyaya GK, Vaishya R, Jain V, Chen JAJ, Chung W jean, et al. COVID-19 and applications of smartphone technology in the current pandemic. J Allergy Clin Immunol Pract. 2020;14(5): 733–737. doi: 10.1016/j.dsx.2020.05.033
14. Smith AC, Thomas E, Snoswell CL, Haydon H, Mehrotra A, Clemensen J, et al. Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). J Telemed Telecare. 2020; 26(5):309-313. doi: 10.1177/1357633X20916567.

15. Low SY, Ko SQ, Ang IYH. Health Care Providers' Experiences and Perceptions with Telehealth Tools in a Hospital-at-Home Program: Mixed Methods Study. JMIR Hum Factors. 2025;12: e56860. doi: 10.2196/56860.
16. Downes MJ, Brennan ML, Williams HC, Dean RS. Development of a critical appraisal tool to assess the quality of cross-sectional studies (AXIS). BMJ Open. 2016; 6(12): e011458. doi: 10.1136/bmjopen-2016-011458.
17. Rovito MJ, Bruzzone A, Lee E, López Castillo H, Talton W, Taliaferro L, et al. Assessing Health-Related Quality of Life Among Survivors of Testicular Cancer: A Systematic Review. Am J Mens Health. 2021; 15(1):1557988320982184. doi: 10.1177/1557988320982184.
18. Kumar G, Shardha HK, Tariq W, Qazi MA, Kumar K, Maheshwari C, et al. Assessment of knowledge and attitude of healthcare professionals regarding the use of telemedicine: A cross-sectional study from rural areas of Sindh, Pakistan. Front Public Heal. 2022; 10:967440. doi: 10.3389/fpubh.2022.967440.
19. Nagaraja VH, Ghosh Dastidar B, Suri S, Jani AR. Perspectives and use of telemedicine by doctors in India: A cross-sectional study. Heal Policy Technol. 2024;13(2):100845. doi: 10.1016/j.hlpt.2024.100845
20. Owoeye GO, Nwaogwugwu JC, Ehinze ES. The Knowledge, Perception and Utilisation of E-Health among Health Workers in Benin City, Nigeria. Niger Med J. 2022;63(3):226-235.
21. Guillari A, Sansone V, Giordano V, Catone M, Rea T. Assessing digital health knowledge, attitudes and practices among nurses in Naples: A survey study protocol. BMJ Open. 2024; 14(6): e081721. doi: 10.1136/bmjopen-2023-081721.
22. Walle AD, Butta FW, Kassie SY, Chereka AA, Kanfe SG, Dubale AT, et al. Healthcare Professionals' Attitude to Using Mobile Health Technology and Its Associated Factors in a Resource-Limited Country - An Implication for Digital Health Implementers: A Cross-Sectional Study. Biomed Res Int. 2024; 2024:1631376. doi: 10.1155/2024/1631376.
23. Alghamdi SM, Aldhahir AM, Alqahtani JS, Siraj RA, Alsulayyim AS, Almojaibel AA, et al. Healthcare Providers' Perception and Barriers Concerning the Use of Telehealth Applications in Saudi Arabia: A Cross-Sectional Study. Healthc. 2022; 10(8):1527. doi: 10.3390/healthcare10081527.
24. Andronic O, Petrescu GED, Artamonov AR, Bolocan A, Rădăvoi D, Bran M, et al. Healthcare Professionals' Specialists' Perception of Telemedicine in Romania—A Quantitative Study of Beliefs, Practices, and Expectations. Healthc. 2023; 11(11):1552. doi: 10.3390/healthcare11111552.
25. Petrov D, Petrova M, Mladenova I, Dimitrov N, Mratskova G. A survey of the knowledge, perceptions of and attitudes to digital health of healthcare professionals in 14 Bulgarian hospitals: First large-scale study on digital health in Bulgarian inpatient facilities. Digit Heal. 2023; 9:20552076231185276. doi: 10.1177/20552076231185276
26. Takuwa M, Mbabazi SE, Tusabe M, Mulindwa B, Makobore PN, Mulerwa M, et al. Mobile Health Access and Utilisation in Uganda: Knowledge, Attitudes and Perceptions of Health and Veterinary Workers. Telemed e-Health. 2023; 29(6):912-920. doi: 10.1089/tmj.2022.0375.
27. Okronipa AQ, Aboagye-Darko D, Nyame JY. Perception of healthcare and health information professionals on the usage of HIS for administrative and clinical work processes. Researchsquare.com; 2023. doi: 10.21203/rs.3.rs-3128919/v1
28. Wernhart A, Gahbauer S, Haluza D. eHealth and telemedicine: Practices and beliefs among healthcare professionals and medical students at a medical university. PLoS One. 2019; 14(2): e0213067. doi: 10.1371/journal.pone.0213067
29. Emary PC, Stuber KJ, Mbuagbaw L, Oremus M, Nolet PS, Nash J V., et al. Quality of Reporting Using Good Reporting of A Mixed Methods Study Criteria in Chiropractic Mixed Methods Research: A Methodological Review. J Manipulative Physiol Ther 2023; 46(3):152-161. doi: 10.1016/j.jmpt.2023.11.004.
30. Scott Kruse C, Karem P, Shifflett K, Vegi L, Ravi K, Brooks M. Evaluating barriers to adopting telemedicine worldwide: A systematic review. J Telemed Telecare. 2018; 24(1):4–12. doi: 10.1177/1357633X16674087

31. Greenhalgh T, A'Court C, Shaw S. Understanding heart failure; explaining telehealth - a hermeneutic systematic review. BMC Cardiovasc Disord. 2017;17(1):156. doi: 10.1186/s12872-017-0594-2.
32. Craig A, Lawford H, Miller M, Chen-Cao L, Woods L, Liaw ST, et al. Use of Technology to Support Health Care Providers Delivering Care in Low- and Lower-Middle-Income Countries: Systematic Umbrella Review. J Med Internet Res. 2025; 27: e66288. doi: 10.2196/66288.
33. Labrique AB, Wadhwani C, Williams KA, Lamptey P, Hesp C, Luk R, et al. Best practices in scaling digital health in low- and middle-income countries. Global Health. 2018; 14(1):103. doi: 10.1186/s12992-018-0424-z.
34. Sylla B, Ismaila O, Diallo G. 25 Years of Digital Health Toward Universal Health Coverage in Low- and Middle-Income Countries: Rapid Systematic Review. J Med Internet Res. 2025; 27: e59042. doi: 10.2196/59042.
35. Wosny M, Strasser LM, Hastings J. Experience of Health Care Professionals Using Digital Tools in the Hospital: Qualitative Systematic Review. JMIR Hum Factors. 2023; 10: e50357. doi: 10.2196/50357.
36. Dominiak M, Gędek A, Antosik AZ, Mierzejewski P. Mobile health for mental health support: a survey of attitudes and concerns among mental health professionals in Poland over the period 2020-2023. Front Psychiatry. 2024; 15:1303878. doi: 10.3389/fpsyt.2024.1303878.
37. Forslund M, Mathieson K, Djibo Y, Mbindyo C, Lugangira N, Balasubramaniam P. Strengthening the evidence base on the use of digital health technologies to accelerate progress towards universal health coverage. Oxford Open Digit Heal. 2024; 2: oqae033. doi: 10.1093/oodh/oqae033
38. OECD. Ready for the Next Crisis? Investing in Health System Resilience, OECD Health Policy Studies, Paris, OECD Publishing, 2023, 475 p. doi: 10.1787/1e53cf80-en.
39. Russpatrick S, Sæbø J, Monteiro E, Nicholson B, Sanner T. Digital resilience to COVID-19. A model for national digital health systems to bounce forward from the shock of a global pandemic. Proc 1st Virtual Conf Implic Inf Digit Technol Dev 2021. 67–80. doi:10.48550/arXiv.2108.09720
40. Tegegne MD, Tilahun B, Mamuye A, Kerie H, Nurhussien F, Zemen E, et al. Digital literacy level and associated factors among health professionals in a referral and teaching hospital: An implication for future digital health systems implementation. Front Public Heal. 2023; 11:1130894. doi: 10.3389/fpubh.2023.1130894.
41. Kaboré SS, Ngangue P, Soubeiga D, Barro A, Pilabré AH, Bationo N, et al. Barriers and facilitators for the sustainability of digital health interventions in low and middle-income countries: A systematic review. Front Digit Heal. 2022; 4:1014375. doi: 10.3389/fdgth.2022.1014375.

How to cite this article: Dery J, Oladipo GS, Ugege EO, Mariere UI. Healthcare workers' perceptions of eHealth implementation: evidence from systematic review methods. *Int J Health Sci Res.* 2026; 16(9):185-203. DOI: *https://doi.org/10.52403/ijhsr.20260921*

******