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# Identifying Stakeholders' Needs for the use of Electronic Health Records

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## Abstract

Despite the growing implementation of Electronic Health Records (EHRs), there is limited understanding of patients' expectations and concerns regarding their use. This paper explores patients' perspectives on using EHRs. Based on a systematic literature review, a questionnaire was developed to identify key perceived advantages (enhanced security, interoperability), barriers (technical challenges, privacy concerns), enablers (collaboration, user feedback), and requirements (interoperability standards, regulatory compliance) influencing the adoption of such wallets. With a sample of 63 respondents, findings highlight the need for accessible tools to accommodate less tech-literate users and contribute to designing truly patient-centric digital health solutions in healthcare operations management.

**Keywords:** Electronic Health Records**,** Patient behavior, Systematic literature review, Questionnaire

## Introduction

Electronic Health Records (EHRs), as a digital improvement over Electronic Medical Records (EMR), focus on employing the most comprehensive information to best support the care delivery process (Rau et al, 2017). EHRs hold patients' medical history and health data, and have been shown to provide many benefits over paper-based solutions, such as cost savings, increased quality of healthcare, advancement of evidence-based medicine data collection and flexibility (Nowrozy et al, 2024; Smith et al, 2016).

Recent research has also shown that many patients want more ease of access to their digital health information (Kahn et al, 2009), and more transparency in EHR can foster more trust and engagement (Gerard et al, 2017). Additionally, some EHR solutions—like blockchain-based solutions—require careful consideration of immutability, privacy, and security configurations (Margheri et al, 2020).

However, its implementation has not been without challenges such as interoperability, privacy and security concerns (Stauch et al, 2014). These challenges have been shown to hinder patient interaction with their health data (van Kessel et al, 2024).

There may also be issues around data control—such as the "right to be forgotten" or demands for data erasure (Zanetti et al, 2023)—and the problem of maintaining rigorous security when personal health data is transferred between systems. Indeed, resistance from stakeholders may grow if these concerns are not adequately addressed.

Electronic Health Records (EHRs) are promising in terms of advantages, yet inconsistent adoption continues and the perception of the users, namely the patients, needs exploring. Low digital literacy and privacy issues impede successful implementation. Current evidence also tends not to capture stakeholder perception in these situations.

As such, to address these challenges and best realize EHRs' benefits, this study aims to assess the patients' perspective of the use of EHRs, namely which characteristics they perceive as benefits, which barriers hinder implementation and adoption, the factors or trends that enable their adoption and the requirements to its adoption.

This paper starts with a Systematic Literature Review (SLR), following the PRISMA framework, to explore t Portugal is a country known to have a low level of technological literacy. The outputs of the SLR are used to build a questionnaire and address how the potential users of EHRs in Portugal perceive these technologies and which specific benefits, barriers and enablers should be particularly addressed to facilitate its adoption.

In the following section we will analyze the results of the Systematic Literature Review, by compiling the barriers, perceived advantages, limitations, enablers and requirements found in current and past literature. In the second chapter we will validate the same literature through a questionnaire and analyze its results.

## Systematic Literature Review

### *Approach*

Several studies have addressed EHR implementation factors; however, at the time of writing, none was found to consolidate and validate them through patients' opinions. This systematic literature review will address the following Research Question:
RQ1: What are the main factors that affect the creation and adoption of an EHR system?
A Systematic Literature review will be conducted, following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) framework (PRISMA,

2020). Searches were conducted in 3 databases – Scopus, Ebscohost and Web of Science, utilizing the following cluster groups of keywords: Healthcare Relevancy (Health, Healthcare); Stakeholder Behaviour (Adoption*, Intention*, Attitude*, Usage, Motivation*, Engagement); Health System Typology ("Health System", EHR, Wallet*, PHR); Storage Technology (Blockchain, Token, "Health Data"). To be considered initially relevant a paper had to contain at least one keyword from each of the 4 clusters.

*Selection process*

411 records identified from the three databases (151 from Scopus, 147 from Ebscohost and 113 from Web of Science as of December 2024). 205 duplicates were removed, with 206 remaining distinct records, from which 65 were unanimously excluded during abstract and title screening. Following screening, 141 articles were retrieved and later assessed for eligibility; from this group, 13 articles were out of scope, leading to a final group of 128 articles. Figure 1 shows the detailed numbers through the process.

The screening process was carried out independently by the researchers and the results were compared. Whenever the decision of inclusion of an article was not unanimous, discussion followed until consensus was reached. After their listing, the selected studies went through content analysis in the search for benefits, barriers, and enablers of the adoption of EHR.

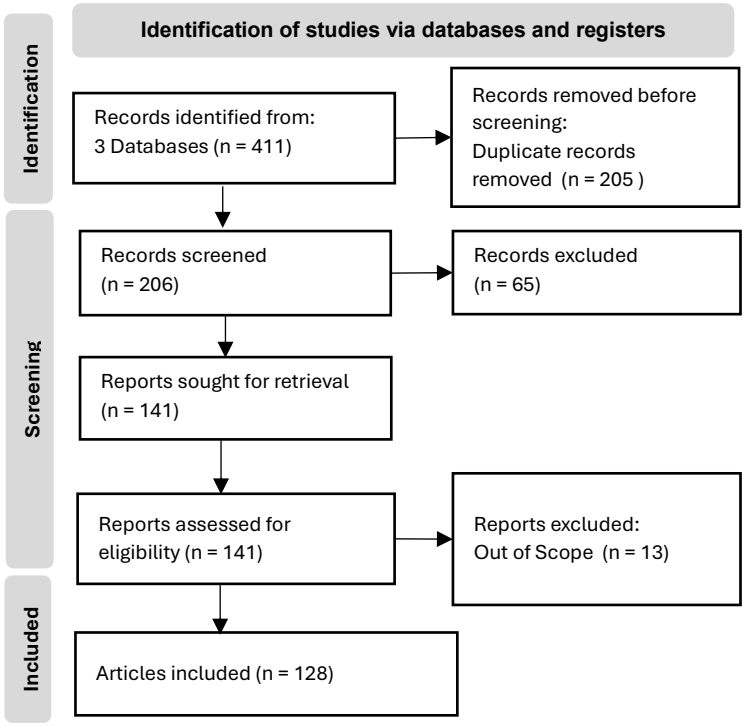



*Figure 1 – PRISMA Framework Results*

*Results*

*Table 1 – Perceived barriers to the use of EHR*

| Barrier | Authors |
|---|---|
| 1) Privacy & Security | Samala, Rawas, 2024; Nankya et al, 2024; Sultana et al, 2020; Lo et al, 2019; Baz et al, 2021; Khajouei, 2024; Abunadi, Kumar, 2021; Mauricio et al, 2024; Cherif, E, 2022; Comer et al, 2018; Webber et al, 2019; Root et al, 2022; Adler-Milstein, Nong, 2019; Ancker et al, 2019; Cherif, Emna, 2021; Ramachandran, 2024; Pilares et al, 2022; Houtan, Bahar, 2020; Klementi et al, 2024; Stamatellis et al, 2020; Leeming et al, 2019; Griesser, Bidmon, 2024; Dong et al, 2023 |
| 2) Interoperability & Standardization | Smith et al, 2016; Stauch, Forgó, Krügel, 2014; McGuckin et al, 2022; Geissbuhler et al, 2013; Roehrs et al, 2019; Sonkamble et al, 2021; Davis et al, 2022; Sayeed et al, 2020; Gunapal et al, 2016; Wieland-Jorna et al, 2023; Mbunge et al, 2021; Dodevski et al, 2021; Popovich et al, 2018; Pawelek et al, 2022; Donald, Ehrenfeld, 2015; Yao et al, 2018; Kormiltsyn et al, 2023; Patton, Michael J, 2023; Hasavari, Esmaeilzadeh, 2024; Khan, 2019; Roehrs, Alex, 2019; Sulieman et al, 2020; Aljedaani et al, 2023; Hajian et al, 2023; Ramachandran, 2024; Gold et al, 2018; Pilares et al, 2022; Houtan, Bahar, 2020; Klementi et al, 2024; Stamatellis et al, 2020; Leeming et al, 2019; Griesser, Bidmon, 2024; Dong et al, 2023 |
| 3) Cost & Infrastructure | Ebenso et al, 2021; Tilahun et al, 2021; Austin et al, 2021; Nkwanyana et al, 2023; Walker et al, 2021; Bagayoko et al, 2020; Mauricio et al, 2024; Schmeelk et al, 2022 |
| 4) Literacy & Skills | Ebenso et al, 2021; van den Berg et al, 2024; Alanazi et al, 2023; Hill et al, 2018; van Kessel et al, 2024; Ancker et al, 2019 |
| 5) Data Ownership & Consent | Karacic Zanetti, Nunes, 2023; Klementi et al, 2024; Burt et al, 2024; Lu et al, 2020; Cumyn et al, 2021 |
| 6) Usability, Workflow & Workload | Mann, Lawrence, 2022; Rompolas, 2024; Johnson, Hoy, 2011; Park et al, 2018; Adler-Milstein, Nong, 2019; Ancker et al, 2019; Cherif, Emna, 2021; van den Berg et al, 2024; Al Mallah et al, 2010; Bagayoko et al, 2020 |
| 7) Trust, Attitudes & Cultural Factors | Platt et al, 2018; Park et al, 2018; Lu et al, 2020; Bunker et al, 2017; Bostan et al, 2024 |
| 8) Regulatory & Legal | Stauch, Forgó, Krügel, 2014; Barker et al, 2024; Donald, Ehrenfeld, 2015; Cumyn et al, 2021; Thapa, Camtepe, 2021; Lee, Kim, 2024; Baz et al, 2021; Mauricio et al, 2024 |
| 9) Data Quality & Reliability | Smith et al, 2016; Tilahun et al, 2021; Geissbuhler et al, 2013; Nowrozy et al, 2024; Rosner et al, 2021; Rompolas, 2024; Hill et al, 2018; Genes et al, 2018 |

EHR usage has steadily gained traction in many healthcare settings, partly due to both healthcare consumers (Gerard et al, 2017) and providers seeking more data (McGuckin et al, 2022), easier access to said data (Kahn et al, 2009). Technology evolution (Austin et al, 2021), government digitalization initiatives, all take part in pushing EHR utilization. In the pursuit of its multiple obvious advantages such as cost effectiveness and efficiency (Rompolas et al, 2024) and convenience and accessibility (Barker, Wesley et al, 2024) there have also been pushes for more patient control of data, privacy and security concerns assessment (Klementi et al, 2024), by employing a more patient-centric approach (Zanetti et al, 2023). This led to the development of Personal Health Records (PHR). PHRs definitive feature is that information is under the control of the individual (Rau et al, 2017). This presents numerous advantages such as patient empowerment (Rau et al, 2017), data aggregation (Balsari et al, 2018), improved transparency, a more personalized care (Kormiltsyn et al, 2023). However, despite these efforts, multiple barriers of adoption have risen, which can lead to implementation failures, such as the case in Germany, where literacy, fragmentation of health systems and workload burdens led to problems in implementation. (Schmitt, 2023)

Interoperability is the ability of the healthcare systems to share, interpret, and use EHR coherently (Sonkamble R et al, 2021). Lack of interoperability leads to poorly accessible health data, frustration and inefficiency (Kahn et al, 2009). As EHR usage grows so does the necessity of interoperability, EHR gains can only be fully realized when interoperability is not an issue anymore (Samala, Rawas 2024). Practically, this means different platforms should be able to share information seamlessly so that clinicians, patients, and other stakeholders can enjoy the advantages of a fully integrated healthcare ecosystem. Without a good foundation for data exchange, valuable patient records remain siloed, limiting clinical decision-making and undermining the potential of EHR systems to streamline care. Semantic Interoperability can be improved through the utilization of standards such as OpenEHR and Fast Healthcare Interoperability Resources (FHIR) (Sonkamble et al, 2021)

*Table 2 –Perceived Advantages of EHR implementation*

| Advantage | Authors |
|---|---|
| **1) Transparency & Control** | **Gerard et al, 2017; Samala, Rawas, 2024; Sultana et al, 2020; Margheri et al, 2020; Thwin, Vasupongayya, 2019; Kormiltsyn et al, 2023; Lo et al, 2019; Baz et al, 2021; Khajouei, 2024; Ramachandran, 2024; Dong et al, 2023; Hasavari, Esmaeilzadeh, 2024; Cernian et al, 2020; Lan, Li, 2023; Abunadi, Kumar, 2021; Ammar et al, 2021; Karacic Zanetti, Nunes, 2023; Burt et al, 2024; Roehrs et al, 2019; Lee, Kim, 2024; Mutambik et al, 2024** |
| **2) Security & Privacy** | **Samala, Rawas, 2024; Sultana et al, 2020; Xiao et al, 2021; Nankya et al, 2024; Cernian et al, 2020; Khan, 2019; Baz et al, 2021; Lo et al, 2019; Ullah et al, 2024; Fatoum et al, 2021; Sookhak et al, 2021; Hasavari, Esmaeilzadeh, 2024** |
| **3) Convenience & Accessibility** | **Gerard et al, 2017; Kahn et al, 2009; Ebenso et al, 2021; Shenvi et al, 2023; Samala, Rawas, 2024; Pawelek et al, 2022; Popovich et al, 2018; Xiao et al, 2021; Hill et al, 2018; Alanazi et al, 2023; Nabukenya et al, 2023; Lo et al, 2019** |
| **4) Personalized Care & Stakeholder Engagement** | **Gerard et al, 2017; Kahn et al, 2009; Ebenso et al, 2021; Shenvi et al, 2023; Ammar et al, 2021; Austin et al, 2021; Nkwanyana et al, 2023; Donald, Ehrenfeld, 2015; Xiao et al, 2021; van den Berg et al, 2024; Balsari et al, 2018; Sayeed et al, 2020; Mann, Lawrence, 2022; Varhol et al, 2023; Cadoret et al, 2020; Kormiltsyn et al, 2023; Flaumenhaft, Ben-Assuli, 2018; Alanazi et al, 2023; Rompolas, 2024; Park et al, 2018; Donida et al, 2021; Rau et al, 2017; Schmitt, 2023; Agarwal et al, 2013; Root et al, 2022; Adler-Milstein, Nong, 2019; Ancker et al, 2019; Cherif, Emna, 2021; Sangal et al, 2021; Neinstein et al, 2020; Dong et al, 2023; Klementi et al, 2024; Leeming et al, 2019; Griesser, Bidmon, 2024** |
| **5) Data Sharing & Interoperability** | **Samala, Rawas, 2024; Xiao et al, 2021; Dodevski et al, 2021; Mauricio et al, 2024; Lee, Kim, 2024; Khajouei, 2024; Lan, Li, 2023; Nankya et al, 2024; Roehrs et al, 2019; Kim et al, 2017; Burt et al, 2024; Madine et al, 2020** |
| **6) Research & Innovation** | **Stauch, Forgó, Krügel, 2014; Pawelek et al, 2022; Popovich et al, 2018; Donald, Ehrenfeld, 2015; Sydes et al, 2021; Nankya et al, 2024; Balsari et al, 2018; Mutambik et al, 2024; Walker et al, 2021; Comer et al, 2018; Giordanengo et al, 2016; Rea et al, 2012; Yang, Zhang, 2022; Baz et al, 2021; Phelan et al, 2024; Lan, Li, 2023** |
| **7) Cost Effectiveness & Efficiency** | **Ebenso et al, 2021; Smith et al, 2016; Tilahun et al, 2021; Samala, Rawas, 2024; van den Berg et al, 2024; Rompolas, 2024; Johnson, Hoy, 2011; Agarwal et al, 2013; Beglaryan, Petrosyan, Bunker, 2017; Hajian et al, 2023; Pilares et al, 2022; Klementi et al, 2024; Stamatellis et al, 2020; Hasavari, Esmaeilzadeh, 2024** |

EHR privacy refers to the patient's ability to control their health information and protect it from unauthorized access. EHR security refers to safeguards that protect EHR from unauthorized access (Nowrozy et al, 2024). Consumers are showing their desire to control their data (Spector-Bagdady et al, 2024). Healthcare data breaches have increased

significantly over the past 14 years, intensifying security concerns with these systems (Nankya et al, 2024).

*Table 3 –Enablers for EHR implementation*

| Enabler | Authors |
|---|---|
| 1) Transparency & Trust | Gerard et al, 2017; Platt et al, 2018; Cumyn et al, 2021; Burt et al, 2024; Lu et al, 2020; Spector-Bagdady, Kayte, 2024; Balsari et al, 2018; Kormiltsyn et al, 2023; Lo et al, 2019; Abunadi, Kumar, 2021; Griesser, Bidmon, 2024 |
| 2) Supportive Policy & Regulation | Barker et al, 2024; Donida et al, 2021; Nankya et al, 2024; Vivekrabinson et al, 2024; Wieland-Jorna et al, 2023; Mbunge et al, 2021; Thapa, Camtepe, 2021; Baz et al, 2021; Schmeelk et al, 2022; Webber et al, 2019; Sayeed et al, 2020; Samala, Rawas, 2024 |
| 3) Interoperability & Tech Standards | Sonkamble et al, 2021; Roehrs et al, 2019; Xiao et al, 2021; Cernian et al, 2020; Davis et al, 2022; Aljedaani et al, 2023; Phelan et al, 2024; Kim et al, 2017; Kahn et al, 2009; Lan, Li, 2023; Sookhak et al, 2021; Yao et al, 2018; Mauricio et al, 2024 |
| 4) Data-Driven / Evidence-Based Approaches | McGuckin et al, 2022; Gunapal et al, 2016; Walker et al, 2021; Comer et al, 2018; Rea et al, 2012; Giordanengo et al, 2016; Sydes et al, 2021; Dodevski et al, 2021; Hill et al, 2018; Al Mallah et al, 2010; Wu et al, 2024 |
| 5) Consumer Demand & Patient Empowerment | Kahn et al, 2009; Pawelek et al, 2022; Hajian et al, 2023; Park et al, 2018; Donida et al, 2021; Alanazi et al, 2023; Griesser, Bidmon, 2024; Ancker et al, 2019; van den Berg et al, 2024; Cernian et al, 2020; Agarwal et al, 2013 |
| 6) Technological Innovation & Infrastructure | Mbunge et al, 2021; Nankya et al, 2024; Balsari et al, 2018; Fatoum et al, 2021; Margheri et al, 2020; Genes et al, 2018; Pilares et al, 2022; Roehrs, Alex, 2019; Lo et al, 2019; Ullah et al, 2024; Lan, Li, 2023; Wu et al, 2024; Sulieman et al, 2020; Dong et al, 2023 |
| 7) Healthcare Workforce & Accountability | van den Berg et al, 2024; Hill et al, 2018; Mann, Lawrence, 2022; Johnson, Hoy, 2011; Genes et al, 2018; Kariotis et al, 2022; Nkwanyana et al, 2023; Bagayoko et al, 2020; Root et al, 2022; Lo et al, 2019; Agarwal et al, 2013 |
| 8) EHR Maturity & Cost Reductions | Smith et al, 2016; Rompolas, 2024; Schmeelk et al, 2022; Eichenseher, 2022 |

*Table 4 –Requirements for EHR implementation*

| Requirement | Authors |
|---|---|
| 1) Interoperability & Standards | Kahn et al, 2009; Sayeed et al, 2020; Sonkamble et al, 2021; Davis et al, 2022; Roehrs et al, 2019; Pawelek et al, 2022; Cernian et al, 2020; Mauricio et al, 2024; Aljedaani et al, 2023; Lan, Li, 2023; Sookhak et al, 2021; Yao et al, 2018; Kim et al, 2017 |
| 2) Regulatory & Legal | Stauch, Forgó, Krügel, 2014; Thapa, Camtepe, 2021; Lee, Kim, 2024; Nankya et al, 2024; Barker et al, 2024; Baz et al, 2021; Donald, Ehrenfeld, 2015; Cumyn et al, 2021; Meier et al, 2021; Samala, Rawas, 2024 |
| 3) Security & Privacy | Samala, Rawas, 2024; Lo et al, 2019; Sultana et al, 2020; Xiao et al, 2021; Fatoum et al, 2021; Ramachandran, 2024; Ullah et al, 2024; Cernian et al, 2020; Hasavari, Esmaeilzadeh, 2024; Baz et al, 2021 |
| 4) Data Ownership & Control | Karacic Zanetti, Nunes, 2023; Lu et al, 2020; Cumyn et al, 2021; Cadoret et al, 2020; Kormiltsyn et al, 2023 |
| 5) Ease of Use, UI/UX & Perceived Usefulness | Ebenso et al, 2021; Shenvi et al, 2023; Park et al, 2018; Ancker et al, 2019; Dong et al, 2023; Mann, Lawrence, 2022; Alanazi et al, 2023; Griesser, Bidmon, 2024 |
| 6) Implementation & Integration / Workflow | Adler-Milstein, Nong, 2019; Ancker et al, 2019; van den Berg et al, 2024; Al Mallah et al, 2010; Bagayoko et al, 2020; Cherif, Emna, 2021; Austin et al, 2021; Rompolas, 2024 |
| 7) Data Quality & Reliability | Smith et al, 2016; Geissbuhler et al, 2013; Nowrozy et al, 2024; Rosner et al, 2021; Rea et al, 2012; Wu et al, 2024; Genes et al, 2018 |
| 8) Training & Stakeholder Engagement | Mbunge et al, 2021; Nankya et al, 2024; Balsari et al, 2018; Mann, Lawrence, 2022; Johnson, Hoy, 2011; Kariotis et al, 2022; Bagayoko et al, 2020; Lo et al, 2019; Genes et al, 2018; Agarwal et al, 2013; Walker et al, 2021; Root et al, 2022; Peacock et al, 2022 |

*Table 5 –Limitations to EHR implementation*

| Limitation | Authors |
|---|---|
| 1) Policy & Regulation | Kahn et al, 2009; Mbunge et al, 2021; Schmeelk et al, 2022; Geissbuhler et al, 2013; Nankya et al, 2024; Meier et al, 2021; Burt et al, 2024 |
| 2) Interoperability & Standardization | Dodevski et al, 2021; Schmeelk et al, 2022 |
| 3) Technology & Scalability | Xiao et al, 2021; Sonkamble et al, 2021; Nowrozy et al, 2024; Nankya et al, 2024; Thapa, Camtepe, 2021; Schmeelk et al, 2022; Ullah et al, 2024; Yao et al, 2018; Yang, Zhang, 2022 |
| 4) Privacy & Security | Margheri et al, 2020; Sultana et al, 2020; Lu et al, 2020; Cadoret et al, 2020 |
| 5) Cost & Funding | Smith et al, 2016; Ebenso et al, 2021; Sonkamble et al, 2021; Schmeelk et al, 2022 |
| 6) Access & Infrastructure | Pawelek et al, 2022 |
| 7) Consent & Data Control | Meier et al, 2021; Thwin, Vasupongayya, 2019; Burt et al, 2024; Cadoret et al, 2020 |
| 8) Stakeholder Acceptance & Perspectives | Houtan et al, 2020 |

Lo, Y.-S. et al, 2019 stated that patients preferred the use of Blockchain in EHR systems due to its privacy, decentralization, security, data access and control, showing the demand for better privacy/security. Although this technology still has its security limitations such as attacks, phishing, social engineering (manipulation of people into ignoring secure procedures), identity theft and weak passwords and the problem of possible key losses (Sultana et al, 2020; Meier et al, 2021; Margheri et al 2020) it is still a step forward as it provides characteristics such as immutability, transparency, accountability (Lo et al 2019) and an overall improvement of data security, privacy and confidentiality, interoperability, patient control, operational efficiency and research capabilities (Samala, Rawas 2024; Sookhak et al 2021). Finally, these considerations are also essential to comply with the General Data Protection Regulation (GDPR) (de Beijer et al 2024).

Technological and Health Literacy and skills studies show that familiarity with technology can have an impact on its acceptance (Ebenso et al 2021) and general literacy, health and tech literacy are found to affect the ability of patients to use EHRs (van Kessel et al, 2024), making user-friendliness a key concern especially for users with limited digital health literacy (van den Berg et al, 2024). Consequently, most studies recommend elevating patient literacy for better adoption (Alanazi et al, 2023). Additionally, from the Healthcare provider perspective, EHR portal specific training is required, a challenge considering the already heavy workloads they face (Hill et al 2018).

Usability and Workflow adaptation are key aspects to consider when designing and implementing EHR, as one of the main barriers for practitioners is the fear of workflow changes and increased workloads (Rompolas et al, 2024, Johnson, Bergren et al 2011). For this to be possible, integration into current systems is necessary (Ancker et al 2019) as well as careful UI/UX design that advocates for easy data entry (Park et al 2018)

To overcome these barriers to implementation, advantages and enablers must be leveraged. According to Cheriff et al (2022), consumers' personal health concerns can outweigh the perceived privacy barriers, and trust in healthcare providers reduces privacy concerns. Table 2 shows the perceived advantages of the use of HER and Table 3 shows

the enablers for such implementation. Table 4 highlights the requirements for the implementation of EHR and Table 5 exposes the limitations of such records.

Lower education and literacy levels are associated with reduced engagement in digital health platforms. (Kim et al, 2017; van Kessel et al, 2024) Individuals with higher education levels are more likely to perceive digital health tools such as EHRs and PHRs as useful and are more willing to engage with them for their health and research purposes. (Kim et al, 2017; Alanazi et al, 2023) Additionally, patients who perceive greater benefits from these digital health tools show a stronger willingness to share personal health data despite privacy concerns. (Cherif et al, 2022; Cherif et al 2021) Taken together these findings suggest the following hypotheses on how education may be an important factor both to technological literacy and perceived advantages and consequently the successful implementation of EHR.

H1: Education level is positively associated with overall technological literacy.

H2: Education level is positively associated with the perceived advantages of digital health tools.

H3: Individuals who perceive more advantages in digital health tools are more comfortable sharing personal health information.

**Data Collection Tool**

To collect data to test the hypotheses, a questionnaire was built based on the SLR.

The questionnaire was divided into 5 Dimensions: (1) Sociodemographic.; (2) Technological Literacy, intending to assess the level of technological literacy of respondents; (3) Relationship with Technology (Privacy and Security), aiming to assess the emotional relationship with technology of individuals before the presentation of a certain technology and relates mostly to the barriers section from the systematic literature review. ; (4) Perceived Advantages & Requirements: this relates to the most prominent Advantages and Requirements enunciated in the Systematic Literature Review; (5) Perceived Advantages & Technology Relationship: aiming to assess the patients' outlooks when faced with the possibility of implementing a PHR platform that aggregates their personal Health Information. Sections 3, 4, and 5 used 7 point Likert-like scales with the option to suggest and classify additional items. The questionnaire was distributed through social media platforms and personal networks, allowing for a broader and more diverse reach among potential participants. The questionnaire was supported by Microsoft Forms. Data was extracted to Excel and analyzed using SPSS Statistics 29.0.2.

**Sample**

63 responses have been collected so far. From these, 65% (n=41) identified as Women. Ages 18–25 account for 32% (n=20), 26–35 account for 22% (n=14), 36–50 account for 25% (n=16), 51–65 account for 10% (n=10), and 66 and over count for 5% (n=3), showing a relatively young sample. Regarding education, the sample crosses all level in a reasonably balanced way: 21% (n=13) have primary education, 30% secondary education (n=19), 29% (n=18) have a bachelor and the remaining 21% (n=13) reported post-graduating studies. Regarding urbanization level, 41% live in rural areas and 59% in urban ones.

**Findings & Discussion**

Respondents reported a high level of technological literacy (an average of 6.1 out of 7 and standard deviation of 1.556), showing an overall good ability to reach a website, make online payments, install application, access online vaccination information, copy and move files, and upload files.

An average privacy and security concern level of 4.182 out of 7 and a standard deviation of 0.863 (consisting of concern of unauthorized access to health data, unauthorized access by medical personnel, some lack of comfort in sending information through an EHR platform, some lack of comfort in sending a picture of a body part though an EHR platform, fear of unauthorized sharing of data between organizations, and a preference of receiving data through EHR over another communication application), i.e., shows a sample with concerns about the misuse of the data stores in the HER platform and reasonable agreement between the sample respondents.

An aggregated average perceived advantage level of 5.816 out of 7 points and standard deviation of 1.248 (consisting of Role-Based-Access-Control level, scheduling appointment level, improved communication with personal doctor level, wearable data advantage level, consolidation of medical records from different hospitals level, selling or donating data for research level, and voice control level), the sample shows a relatively good reading of the potential of the EHR.

An average Tech Expectation level of 5.837 out of 7 points and a standard deviation of 1.045 showing good expected outcomes for the implementation of the technology (consisting of expectation to make healthcare more personalized, expectation to improve stakeholder communication, expectation to improving privacy and security, expectation to improve medical care efficacy, expectation to improving research, expectation to improve healthcare accessibility, expectation to reducing costs, and expectation to making healthcare more efficient).

Negative correlations with key aspects of digital literacy were found with age: website navigation (r = -0.341**), online payment ability (r = -0.258*), app installation (r = -0.308*), accessing online vaccination services (r = -0.293*), and moving files (r = -0.266*), and uploading files (r = -0.329*). These findings indicate that as age increases, there is a decline in proficiency with digital tools and services. On one hand, it shows that training to facilitate the adoption of HER should be more focused on older persons, but it also shows that the natural evolution of time will lead to overcoming this constraint.

Positive correlations were found between education level and both technological literacy and perceived advantages of digital health tools. Education level was moderately but significantly positively correlated with overall tech literacy (r = 0.315*), including specific skills such as accessing websites (r = 0.317*), making online payments (r = 0.256*), and using digital platforms to access vaccination services (r = 0.258*). Thus, accepting the hypothesis for H1.

Furthermore, higher education showed a positive, significant and strong correlation with the recognition of the benefits of digital health features, including role-based access control (r = 0.451**), appointment scheduling (r = 0.395**), communication with personal doctors (r = 0.397**), and the use of wearable data to support healthcare (r = 0.361**). The strongest correlation observed was between education level and the



** Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

perceived value of integrating medical records across institutions (r = 0.508**). Overall, education level also showed a significant positive correlation with the mean perceived advantages of digital health (r = 0.282*) and the belief that technology can make healthcare more convenient and accessible (r = 0.260*). Consequently, the hypothesis H2 is accepted.

Participants who recognized more benefits in digital health tools also demonstrated greater comfort in using these tools for personal health matters. Higher perceived advantages were significantly and positively correlated with being comfortable sharing information through health apps (r = 0.408**) and reduced fear of unauthorized information sharing between organizations (r = 0.328**). The hypothesis H3 was therefore accepted. These individuals were also more likely to prefer receiving medical exam results through apps (r = 0.284*) and believed digital tools could personalize healthcare (r = 0.503**), improve communication among stakeholders (r = 0.449**), enhance security and privacy (r = 0.485**), and support better medical care (r = 0.367**), research (r = 0.320*), and cost reduction (r = 0.390**). Additionally, they linked digital health tools with greater efficiency in service delivery (r = 0.260*).

## Conclusion

The results observed in this study reflect several of the trends highlighted in the literature, particularly regarding the role of technological literacy, perceived advantages, and privacy concerns in influencing digital health adoption. The negative association between age and tech literacy, as well as the positive correlation between education and both literacy and perceived benefits, aligns with the identified importance of user capabilities, comfort, and ease of use in successful implementation. Furthermore, the link between recognizing digital health advantages and greater comfort in sharing data supports the notion that trust and transparency are critical enablers. These findings suggest that addressing literacy gaps, adapting communication strategies to different user profiles, and clearly presenting the value of digital tools are essential steps toward overcoming adoption barriers and advancing patient-centered, secure, and efficient health information systems.

It is important to note that the questionnaire is still ongoing, and the current sample size remains relatively small, which may limit the generalizability of the results at this stage.

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## References

The complete list of references will be made available upon reasonable request.



** Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).