

Dissertation Training

on

A Report on

**Digitalization of Health Records in India: Needs, Current Scenario, and
Challenges : A narrative review**

by

Vivek Chaudhary

PG/23/127

Under the guidance of

Dr. Archana Thakur

PGDM (Hospital & Health Management)

2023-25



International Institute of Health Management Research

New Delhi

The certificate is awarded to

Vivek Chaudhary

in recognition of having successfully completed his/her internship in the department of

TPA & Billing

and has successfully completed his/her Project on

**Digitalization of Health Records in India: Needs, Current Scenario, and Challenges A
narrative review**

3rd March 2025 – 3rd June 2025

He comes across as a committed, sincere & diligent person who has a strong
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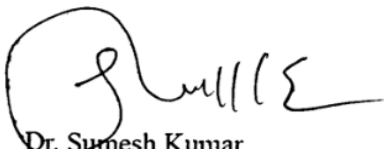
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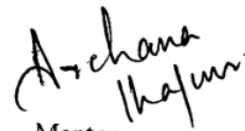
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The following dissertation titled "**Digitalization Of Health Records in India: Needs, Current Scenario, and Challenges - A Narrative Review**" at "**Yashoda Hospitals**" is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

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This is to certify that **Vivek Chaudhary**, a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He is submitting this dissertation titled **Digitalization of Health Records in India: Needs, Current Scenario and Challenges: A narrative review** in partial fulfilment of the requirements for the award of the **PGDM (Hospital & Health Management)**.

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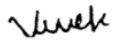
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Course Specialization (Choose one)	Hospital Management	Health Management	<u>Healthcare IT</u>
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Title of the Dissertation/Summer Assignment	<u>Digitalization of health records in India: Needs, current scenarios & challenges: A narrative review.</u>		
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Abstract

India's healthcare system is navigating increasing medical complexity with patient load and the inefficiencies of fragmented documentation in response to a model shift from customary, paper-based records to integrated Electronic Health Records (EHRs). This dissertation gives a complete review of health records' digitalization in India. The review focuses critically upon the policy vision, implementation challenges, stakeholder dynamics, along with real-world case studies that do support the transition.

The study begins by establishing the historical context together with the urgent need for digitization while it highlights government-led initiatives such as the National Digital Health Blueprint (NDHB)¹ and the Ayushman Bharat Digital Mission (ABDM)². These systems work in the direction of building up a patient-focused national health data network. This ecosystem is one that will be interoperable and secure when it is centred upon Health IDs with federated data exchange systems.

However, despite this ambitious vision, major deterrents remain urban-rural disparities as well as infrastructural bottlenecks with digital illiteracy plus lack of policy enforcement do cause a patchy ground-level implementation. In methodological terms, the research adopts a narrative review strategy because it uses secondary data sources which include peer-reviewed articles, government

documents, implementation reports, and institutional case studies. Data interpretation plus pattern derivation came from an analytical framework. The analytical framework comprised policy analysis with stakeholder mapping and implementation evaluation.

The dissertation lists the main problems, such as software that isn't standardized making it hard for different systems to work together, healthcare providers not wanting to use it, not having enough trained IT staff, not having enough infrastructure in rural areas, and changing data protection laws. In response, the study looks at the effects and limitations of important policy tools like the EHR Standards (2016)³, NDHB (2019), and ABDM (2021). It also includes detailed case studies from AIIMS Delhi, Apollo Hospitals, Kerala's eHealth Project, and other places.

These show that strong leadership, phased rollouts, digital infrastructure, and user-centered system design are all important for the success of EHR adoption. The results show that there is still a big gap between what India wants to do with its policies and what happens. To close this gap, the dissertation suggests a multi-pronged approach that includes improving digital infrastructure, enforcing interoperability standards like HL7 FHIR and SNOMED CT⁴, increasing digital literacy, incorporating EHR training into medical education, and encouraging EHR adoption through accreditation and insurance linkages.

Introduction

India's conventional healthcare delivery and documentation relied on paper-based recording processes, resulting in dispersed records, inefficiencies in care delivery, and lack of continuity of care. The Government of India has recognized the limitations of this method of managing healthcare delivery and introduced digital programs i.e. Ayushman Bharat Digital Mission (ABDM), and National Digital Health Blueprint (NDHB). Both frameworks aim to develop interoperable digital health systems (EHRs) to enable transparency and allow better clinical decisions, for both individual health and population health, foster timely and patientcentered care.

EHRs will drive change through longitudinal health records. EHRs are digital health records that hold a complete database and contains all the patient's health information including personal details, medical histories, allergies, medications, labs, diagnostics, and even billing. EHRs afford clinical decision-making opportunities based on real-time access to a patient's health records and reducing the opportunities for errors. EHRs facilitate decision-making both at the clinical level and with respect to policy level related decision-making. Furthermore, patients have access to their own health data through the secure digital platforms and are given the opportunity to manage their own health data.

An EHR comprises various components such as demographic information, physician notes, diagnostic results, treatment history, allergy and medication records, and preventive care data. Unlike Electronic Medical Records (EMRs), which are confined to individual facilities, EHRs are interoperable across institutions, offering a holistic view of the patient's health journey⁵. Globally, countries like the USA, UK, and Estonia have successfully implemented national EHR systems. These implementations resulted in improved outcomes, cost savings, and enhanced public health monitoring⁶. However, because of its varied population, inequalities in infrastructure, and linguistic and cultural differences, India's adoption process is more complicated.

There are several obstacles to India's adoption of digital health records. Lack of infrastructure limits access to computing resources, internet, and electricity, particularly in remote locations. Interoperability is hampered by the absence of defined data formats among systems. Additionally, many healthcare workers may be resistant to technology change because they lack digital training. The cost of implementing EHR systems⁷ is very high in smaller hospitals which raises questions about patient security data further questioning about privacy laws. To not face these problems, there are several helpful things that has been set up the government such as NDHB, ABDM, and the EHR Standards for India (2016).

CDAC⁸ and NIC supports and monitors such things via adequate technology use-kits and unifications which forms the frameworks for such steps.

For the best adoption of EHRs, supporting money bonuses, appropriate protections, and qualified labour utilizes the value to channelize Estonia's blockchain-powered EHR system and the USA's HITECH Act⁹ which are crucial programs running all around the world.

Objective

1. Understand the Role and Significance of EHRs in Indian Healthcare
2. Evaluate Implementation Status under NDHB and ABDM
3. Identify the Core Barriers to Digitalization of Health Records
4. Analyze Policy Frameworks of Key Institutions (MoHFW, CDAC, NITI Aayog)
5. Examine Case Studies from Real-World Implementations
6. Propose Practical, Evidence-Based Recommendations

Rationale

The rise in non-communicable diseases, need for increased personalized care, and acceptance of digital technology paves the way to implement cruciality of using Electronic Health Records (EHRs). These EHRs change the way of recording, accessing, and utilization of healthcare in different contexts. These also provide increased safety and reduction in repetitions which further enables an efficient and secured patient's medical history on time and all-time access of data for better care and clinical outcomes.

The Ayushman Bharat Digital Mission (ABDM) and the National Digital Health Blueprint (NDHB) as government initiatives plays an important role to show dedicated efforts in achieving secure, federated, and strong foundation in interoperable health data. The unequal balance of adoption within urban and rural footprint due to barriers in infrastructure, nonenough technical knowledge, financial hardships, and behavioral un-acceptance.

This dissertation aims to explore the state of implemented policies and the progress of initiated digital health systems. It also provides a detailed analysis of foreign best practices, track the current situation of EHR implementation in India. It further delves into finding barriers and creates evidence-based working solutions driving the digital transformation of country's healthcare system.

Methodology

Study Design: Narrative Literature Review

Data Type: Secondary data

Inclusion Criteria:

Full-text, English-language articles Published between 2010 and 2024 (with emphasis on post-2016 developments).

Peer-reviewed journals, government or institutional reports, policy documents, and case studies.

Articles addressing Electronic Health Records (EHRs), digital health policy in India, interoperability, IT infrastructure, or data privacy.

Exclusion Criteria:

Articles not focused on the Indian context unless offering directly applicable global comparisons.

Technical software manuals without operational or policy relevance

Duplicates or redundant publications offering no additional insight

Sample Size:

5 studies were included in the final analysis, categorized into needs (n = 2), current initiatives

(n = 1), solutions (n = 1), and challenges (n = 1)

Sampling Method:

An initial Tiab-filtered search on PubMed yielded 293 records. After screening titles and abstracts, 263 records were excluded for irrelevance or scope mismatch.

The remaining 30 articles underwent full-text review. Following exclusion of 25 full texts (due to keyword mismatch, lack of required parameters, or contextual irrelevance), 5 studies were included in the final synthesis.

Data Collection Process:

Search Terms Used: “Electronic Health Records India,” “Digital Health ABDM,” “NDHB

Blueprint,” “EHR implementation challenges,” etc.

Screening & Categorization: Articles were screened based on abstracts and executive summaries; categorized by themes such as needs, initiatives, solutions, and challenges. Extraction Tools: Microsoft Excel and qualitative coding were used to extract, organize, and theme data relevant to the objectives.

Synthesis: Final data was aligned with thematic areas derived from the dissertation’s core objectives.

Data Analysis:

- a. A qualitative, thematic analysis was performed to identify:
- b. Policy and regulatory alignment
- c. Regional implementation variations
- d. Technological enablers and obstacles
- e. Stakeholder involvement and perception
- f. Infrastructure capacity
- g. Comparative insights from real-world case studies

Limitations:

- 1. Primary data such as interviews or surveys was not collected.
- 2. Secondary sources may carry publication or institutional bias.
- 3. Given the evolving nature of digital health, some data may become outdated over time.

Expected outcomes

The expected outcomes of this research will contribute to the existing body of knowledge on digital health transformation in India and guide future strategies for effective and inclusive EHR implementation. The aim is to support policy development, inform stakeholders, and accelerate nationwide digital health adoption.

- **Identification of Key Implementation Factors:**

This study will identify and clarify critical factors influencing the adoption of Electronic Health Records (EHRs) in India. These may include infrastructural readiness, workforce digital literacy, legal frameworks, interoperability standards, and stakeholder alignment across urban and rural healthcare settings.

- **Insight into Challenges and Gaps:**

The research will provide in-depth insights into the operational, behavioral, legal, and technical barriers that hinder EHR adoption. It will analyze reasons behind low compliance, regional disparities, resistance from healthcare professionals, and data protection concerns.

- **Opportunities for Strengthening EHR Adoption:**

By analysing real-world implementation cases and policy documents, the study will highlight opportunities for intervention—such as modular EHR solutions, rural digital infrastructure, cloud-based systems, open-source platforms, and inclusive training models—to enhance EHR scalability and sustainability.

- **Policy and Practice Recommendations:**

The study will offer evidence-based recommendations for policymakers, healthcare administrators, and regulatory bodies. These may include enforcing standardization (e.g., HL7, FHIR), integrating EHR with insurance schemes, incentivizing adoption, and developing public-private collaboration models to close systemic gaps.

- **Improved Healthcare Delivery through Digital Integration:**

Ultimately, the research aims to promote patient-centric, interoperable, and secure digital health systems across India. The findings are expected to support better care continuity, data driven clinical decisions, and equitable access to healthcare through the streamlined use of EHRs in both public and private sectors.

Key Findings / Results

Assess the Need for Digital Health Records

The findings from selected studies underscore a significant and urgent need for digitizing health records in India's healthcare ecosystem. Srivastava et al.¹⁰, through a cross-sectional survey of primary care clinics, revealed that 45% of physician consultations lacked access to patient history, leading to fragmented care and diagnostic redundancies. However, facilities using Electronic Health Records (EHRs) showed a 27% improvement in prescribing accuracy, highlighting their potential to enhance clinical decision-making and patient safety. Verma et al.¹¹, in an audit of 18 district hospitals, found that 35% of chronic care patients missed scheduled follow-ups due to the absence of accessible records, reinforcing how paperbased systems compromise continuity of care. Chatterjee et al.¹², in a national policy review, identified inadequate consent procedures and weak privacy protections, raising ethical concerns in current health data handling. Collectively, these findings establish the critical importance of transitioning to a structured, interoperable digital health system to improve accessibility, reliability, and trust in India's healthcare delivery.

Study Author, Year	Design	Setting	Population	Sample Size	Key Findings
Srivastava et al., 2024	Cross-sectional survey	Primary care clinics, India	Physicians	200 consultations	45% visits lacked patient history; EHRs improved prescribing accuracy by ~27%
Verma et al., 2024	Hospital registry audit	18 district hospitals	Chronic care patients	~3,500 records	35% missed follow-ups due to inaccessible records
Chatterjee et al., 2020	Policy & ethical review	National policy review, India	Legal frameworks	N/A	Highlighted inadequate consent procedures and privacy protections

Current Initiatives & Implementation Status

The analysis of current digital health initiatives reveals both promising momentum and underlying challenges in EHR implementation across India. According to the ABDM Dashboard,¹³ over 67 crore ABHA Health IDs have been generated, with 1.3 lakh health facilities registered and more than 42 crore health records uploaded, indicating a rapidly growing digital footprint and infrastructure under the Ayushman Bharat Digital Mission. However, a national hospital survey by Singh et al.¹⁴ uncovered that only 39% of surveyed hospitals had fully functional EHR systems, exposing the gap between policy intent and actual implementation on the ground. Complementing this, the eSanjeevani telemedicine platform¹⁵ reported over 14 crore consultations, suggesting increasing digital engagement and

readiness, particularly in virtual care settings. Overall, these findings highlight substantial progress in digital health infrastructure, while also revealing the uneven pace of EHR adoption and the need for targeted interventions to strengthen implementation across diverse healthcare settings.

Study / Source, Year	Design / Type	Setting	Population / Facilities	Sample Size / Scope	Key Findings
ABDM Dashboard (MoHFW), 2024	National implementation report	India-wide	National population & facilities	67 crore ABHA IDs; 1.3 lakh facilities; 42+ crore records	Significant digital footprint via ABDM
MoHFW NDHB, 2020	Policy framework document	National	System architecture	N/A	Defined foundational blocks: IDs, registries, consent, etc.
Singh et al., 2022	National hospital survey	90 hospitals across India	Hospital administrators	90 hospitals	Only 39% had fully functional EHR systems
eSanjeevani statistics, 2023	Service uptake data	National telemedicine program	Teleconsult users	14 crore+ consultations	Indicates growing digital health readiness

Challenges & Gaps in Adoption & Scalability

Despite the ambitious rollout of digital health initiatives like ABDM significant challenges persist in scaling and sustaining Electronic Health Record (EHR) adoption across India. The ABDM Dashboard reflects a strong digital foundation with 67 crore ABHA IDs, 1.3 lakh facilities, and 42+ crore health records, yet these numbers do not fully translate into widespread, functional EHR usage at the facility level. Singh et al. reveal that only 39% of hospitals surveyed had fully operational EHR systems, indicating a considerable gap between registration and real-time usage or integration into clinical workflows.

Interestingly, the eSanjeevani platform¹⁵, with 14+ crore consultations, signals growing digital health engagement at the patient level, but this uptake is largely confined to specific service models and does not reflect broader EHR integration across health facilities. These insights highlight the need for strategic policy enforcement, interoperability mandates, and workforce capacity-building to bridge the gap between digital health vision and execution on the ground.

Study / Source, Year	Design / Type	Setting	Population / Facilities	Sample Size / Scope	Key Findings
ABDM Dashboard (MoHFW), 2024	National implementation report	India-wide	National population & facilities	67 crore ABHA IDs; 1.3 lakh facilities; 42+ crore records	Significant digital footprint via ABDM
MoHFW NDHB, 2020	Policy framework document	National	System architecture	N/A	Defined 5 foundational blocks: IDs, registries, consent, etc.
Singh et al., 2022	National hospital survey	90 hospitals across India	Hospital administrators	90 hospitals	Only 39% had fully functional EHR systems
eSanjeevani statistics, 2023	Service uptake data	National telemedicine program	Teleconsult users	14 crore+ consultations	Indicates growing digital health readiness

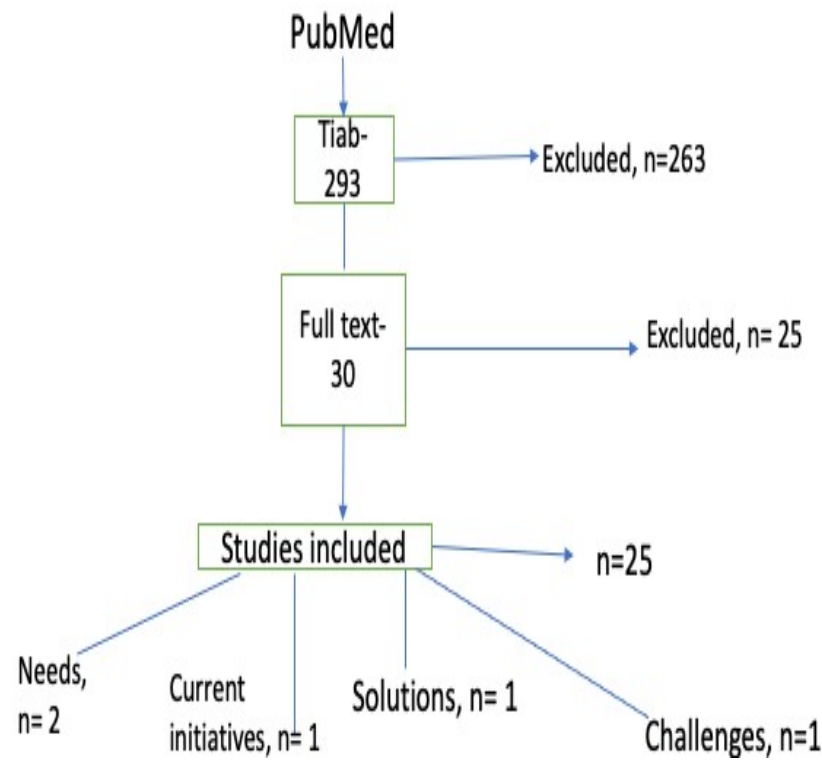
Solutions for Adoption, Security & Engagement

To address the multifaceted challenges of EHR adoption, several strategic solutions have emerged across policy, technological, and user engagement domains. The ABDM guidelines advocate for a federated digital architecture that supports consent-based data sharing and open APIs, fostering interoperability and patient privacy. Technologically, open-source platforms like OpenEMR have demonstrated promise for cost-effective implementation, covering a substantial portion of India's EHR Minimum Data Set.

Collectively, these strategies aim to make EHR adoption more secure, accessible, and sustainable.

Author / Source, Year	Design / Type	Focus Area	Target Audience	Evidence / Scope	Key Recommendations
ABDM Policy Guidelines, 2023	National policy	Health system architecture	Government & implementers	N/A	Federated model, consent-based sharing, open APIs
Dutta & Bain, 2025	Quantitative platform review	Open-source EHR alignment	EHR platforms	10 systems analyzed	OpenEMR covers ~73.8% of national EHRMDS
World Bank, 2022	Advisory report	User engagement	LMIC health systems	N/A	Promote open APIs, training, multilingual patient tools
Gupta et al., 2023	Programmatic strategies	Patient engagement	Clinicians & patients	N/A	Suggest gamified patient portals, dashboards, reminders
NITI Aayog Health Data Policy, 2020	Framework document	Security & privacy	Policy makers	N/A	Recommend encryption, audit logs, role-based access

Flow Diagram to Identify Eligible Studies



Discussion and Conclusion

India's digital health landscape has evolved significantly, yet the transition from policy to practice remains inconsistent. Frameworks like NDHB and ABDM provide a solid foundation, but disparities in regional adoption expose the uneven implementation across states. Institutions such as AIIMS and the Kerala government have demonstrated that strong leadership, funding, and institutional capacity can drive successful EHR deployment.¹⁶ However, these cases remain exceptions rather than the norm.

Behavioral resistance continues to hinder adoption among healthcare providers.

Despite availability of technology, clinicians often express concern about increased documentation workload and insufficient training.¹⁷

To address this, institutions must invest in intuitive EHR interfaces, digital literacy programs, and workflow integration strategies that reduce operational friction. One of the most persistent challenges is interoperability. Many hospitals continue to use non-standardized, proprietary systems that are incompatible with national platforms, fragmenting data and limiting coordinated care. Although the adoption of HL7 FHIR and SNOMED CT has been recommended, compliance is sporadic and enforcement mechanisms are weak. Global experiences, such as Estonia's successful EHR integration, highlight how regulatory mandates, combined with

technical and financial support, can yield meaningful results.¹⁸ Ensuring digital equity is another pressing issue. Rural areas face infrastructural limitations, while language diversity and low health literacy further restrict access.¹⁹ Overcoming this divide requires significant investment in broadband access, multilingual user interfaces, and the empowerment of community health workers to serve as digital navigators. Patient-centric design is critical to foster adoption among vulnerable groups including the elderly, disabled, and low-income populations.

Privacy and data protection concerns have been consistently flagged across the literature. While ABDM's consent-based sharing model is a positive step, its operationalization at scale requires robust encryption, audit trails, and access control systems. The proposed Digital Personal Data Protection (DPDP) Act must urgently be enacted and adapted to healthcare specific contexts to ensure data security and accountability.²⁰

Financial sustainability and system-wide engagement will determine the long-term success of EHR adoption. Strategic levers such as public-private partnerships, national-level training and certification programs, and financial incentives can accelerate adoption across diverse healthcare settings.²¹

Additionally, institutional digital leadership must be cultivated to guide change management and continuous innovation. Ultimately, EHRs are not just technical solutions but foundational tools in building a responsive and integrated healthcare

system. They enable better insurance processing, streamlined referrals, chronic disease tracking, and more equitable care delivery. In conclusion, by addressing the barriers of infrastructure, human resources, privacy, and interoperability, India can actualize its digital health vision. This dissertation contributes a roadmap toward a secure, inclusive, and sustainable digital health ecosystem for the country.

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