AI CHATBOTS IN CHRONIC DISEASE MANAGEMENT: A SYSTEMATIC REVIEW OF THEIR ROLE IN PATIENT ENGAGEMENT

Internship Report

Submitted to

The IIHMR University, Jaipur

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Master of Business Administration (MBA) in

Healthcare Analytics

by

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Under the Supervision and Guidance of

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Internship Report

1. Introduction

This report documents the research internship undertaken by Dikshant Gupta, MBA Healthcare Analytics (Batch 2024–26), at the IIHMR University, Jaipur, under the supervision of Dr. Ram Krishan Chahar, during the period February 25 to June 09, 2026. The internship was conducted in partial fulfilment of the requirements for the degree of Master of Business Administration in Healthcare Analytics.

The internship was centred on the completion of a dissertation-level systematic literature review titled "AI Chatbots in Chronic Disease Management: A Systematic Review of Their Role in Patient Engagement," focusing specifically on India's chronic disease management landscape. This report outlines the objectives of the internship, provides an organisational profile of IIHMR University, describes the services provided by the organisation, presents a detailed timeline of activities undertaken, summarises key research findings, identifies challenges encountered, and enumerates the key learnings across three broad domains: Research Process and Methodology, Public Health Systems and Policy, and Topic-Focused Learnings on AI Chatbots in Chronic Disease Management.

2. Background to the Topic

India faces one of the most formidable chronic disease burdens globally, with an estimated 77 million people living with type 2 diabetes, over 220 million with hypertension, 55 million with chronic obstructive pulmonary disease (COPD), and tens of millions with chronic kidney disease and cardiovascular conditions. These non-communicable diseases (NCDs) account for approximately 60% of all deaths in India annually and are projected to impose a cumulative economic loss of USD 4.58 trillion between 2012 and 2030. Effective management of these conditions requires sustained patient engagement over years — consistent medication adherence, regular self-monitoring, timely clinical communication, and lifestyle modification — but India's healthcare system is structurally ill-equipped to provide this at the scale required.

India's physician-to-population ratio stands at approximately 1 per 1,000, with 65% of the population residing in rural areas served by only 31% of the national healthcare workforce.

Out-of-pocket health expenditure constitutes approximately 47% of total health spending, creating financial barriers to sustained chronic care. These structural realities demand scalable, affordable, and accessible technological interventions that can supplement conventional care pathways.

Artificial Intelligence (AI) chatbots — software applications that use natural language processing (NLP), machine learning, and increasingly large language model (LLM) architectures to conduct automated, personalised health conversations — represent one of the most promising modalities to bridge this gap. Contemporary AI chatbots deployed in chronic disease management contexts perform five core clinical functions: medication adherence support, symptom monitoring, health education, behavioural coaching, and care coordination. Available 24 hours a day at negligible marginal cost, they offer a scalable supplement to the periodic in-person consultations that constitute the primary mode of chronic disease management in India's overstretched healthcare system.

The COVID-19 pandemic served as a pivotal inflection point for AI chatbot adoption in India, with the eSanjeevani national telemedicine platform recording over 340 million consultations by 2024 and the Ayushman Bharat Digital Mission (ABDM) establishing the universal health identifier infrastructure (ABHA) that enables longitudinal, cross-platform patient data integration. Despite this momentum, the evidence base for AI chatbot clinical effectiveness, equitable impact, and responsible implementation remained fragmented — motivating this systematic literature review as a timely and policy-relevant research contribution.

3. Objectives

The primary objective of this internship was to conduct a rigorous systematic literature review focused on the adoption and clinical impact of AI chatbots in chronic disease management in India, examining patient engagement outcomes, adoption determinants, equity implications, and legal and regulatory dimensions. The study aimed to understand how AI chatbot interventions bridge gaps in chronic disease care — particularly between rural and urban populations — and identify challenges related to digital infrastructure, linguistic diversity, health literacy, and ethical governance.

The specific goals of the internship included:

- Conducting a PRISMA 2020-compliant systematic literature review across five academic databases, synthesising evidence from twelve peer-reviewed studies and one grey-literature source published between 2019 and 2025.
- Applying an integrated multi-theoretical framework — combining the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovations (DOI) theory, and Trust-Extended TAM — to interpret AI chatbot adoption dynamics across diverse patient and provider populations.
- Evaluating clinical outcomes of AI chatbot interventions across four chronic disease categories: type 2 diabetes, hypertension, COPD, and paediatric asthma, distinguishing between process outcomes (adherence rates, monitoring frequency) and clinical outcomes (HbA1c values, blood pressure control, hospitalisation rates).
- Identifying multidimensional barriers to equitable AI chatbot adoption — including the digital divide, linguistic fragmentation, health literacy deficits, cultural resistance, data privacy concerns, and regulatory ambiguity — and corresponding facilitators including physician endorsement, government platform integration, and community health worker mediation.
- Analysing the legal, regulatory, and ethical dimensions of AI-mediated patient care in India, including the implications of the Digital Personal Data Protection Act (2023) and the current absence of statutory AI liability frameworks.
- Developing evidence-based policy recommendations for government, healthcare administrators, technology developers, and clinicians, and identifying six critical research gaps requiring future investigation.
- Producing a complete dissertation document aligned with IIHMR University 2026 Dissertation Guidelines, formatted in Vancouver citation style, as a contribution to the evidence base for AI chatbot policy and practice in India.

4. Organizational Profile

The genesis of the IIHMR University, Jaipur dates back to October 05, 1984, when its sponsoring body, the Indian Institute of Health Management Research (IIHMR) was established and registered as a non-profit Society under the Rajasthan Societies Registration Act, 1958. IIHMR University, Jaipur, has been established and incorporated as a postgraduate research University by the Government of Rajasthan vide the IIHMR University Ordinance, 2013 (Ordinance No. 30 of 2013) promulgated on September 27, 2013, by the Governor, which was replaced by the IIHMR University, Jaipur Act, 2014 (Act No. 3 of 2014) passed by the State Legislature on February 07, 2014.

Vision

To become a world-class higher education institution by promoting education and research for the betterment of society.

Mission

IIHMR University is dedicated to the improvement in standards of health through better management of healthcare and related programmes. It seeks to accomplish this through management education, research, training, consultation, and institutional networking in a national and global perspective.

The disciplines in which the University undertakes postgraduate study and research include: Public Health; Health and Hospital Management; Population and Reproductive Health; Nursing Management; Pharmaceutical Management; Rural Management; Health Economics and Finance; Urban Health; Nutrition and Health; Health Communication; Social and Behavioural Sciences; Environmental Health; Information Technology in Health Sector; NGO Management and Entrepreneurship; General and Human Resource Management; and Health Research Ethics.

5. Services Provided by Organization

The University has five Schools:

- Institute of Health Management Research
- School of Pharmaceutical Management
- School of Development Studies
- SD Gupta School of Public Health
- School of Digital Health

IIHMR University has a multi-disciplinary faculty team extensively engaged in academics, research, training, consultancy, partnerships, and collaborations. The University offers the following postgraduate programmes: MBA (Hospital and Health Management), MBA (Pharmaceutical Management), MBA (Healthcare Analytics), and MBA (Development Management). The Johns Hopkins Bloomberg School of Public Health, USA, offers an MPH programme in cooperation with IIHMR University, Jaipur.

IIHMR University offers an MPH (Implementation Science) programme under the WHO-TDR postgraduate training scheme, and PhD programmes in public health, health management, hospital management, digital health, and development studies. The University has contributed significantly to Executive Development and Management Development Programmes, with participants from more than 40 countries. Executive programmes include MPH (Executive), MHA (Executive), MBA (CSR & ESG Management) (Executive), MBA Sustainable Business Management (Executive), and MBA Pharmaceutical Management (Executive).

Student diversity at IIHMR University — spanning geography, culture, academic backgrounds, gender, career aspirations, age, and experience — reflects the institution's commitment to preparing future healthcare leaders who are well-rounded, culturally sensitive, and equipped to address the complex challenges of the global healthcare sector.

6. Timeline of Activities

The internship was conducted over fifteen weeks from February 25 to June 09, 2026. The table below presents the week-wise breakdown of activities undertaken during this period.

Table: Week-wise Timeline of Internship Activities

Phase / Week	Period	Activities Undertaken
Phase 1: Orientation & Planning		
Week 1–2	Feb 25 – Mar 08, 2026	Orientation to IIHMR University; consultation with faculty guide; finalisation of dissertation title and topic; drafting of initial synopsis including objectives, methodology, research questions, and chapter structure.
Phase 2: Literature Search & Screening		
Week 3–4	Mar 09 – Mar 22, 2026	Multi-database literature search across PubMed, Scopus, Web of Science, Google Scholar, and IEEE Xplore; supplementary searches of government repositories (MoHFW, ICMR, NITI Aayog, ABDM) and clinical trial registries (CTRI, WHO ICTRP).
Week 5–6	Mar 23 – Apr 05, 2026	Title/abstract screening; PRISMA 2020 flow implementation; full-text retrieval and eligibility assessment; inter-rater reliability check (Cohen's Kappa = 0.83); documentation of excluded studies with reasons.
Phase 3: Data Extraction & Quality Appraisal		
Week 7–8	Apr 06 – Apr 19, 2026	Standardised data extraction from 12 included studies; quality appraisal using JBI Checklist for cross-sectional studies and AMSTAR-2 for systematic reviews; development of integrated theoretical framework (TAM + UTAUT + DOI + Trust-Extended TAM).

Phase / Week	Period	Activities Undertaken
Week 9–10	Apr 20 – May 03, 2026	Thematic synthesis across eight analytical domains; tabulation of clinical findings by disease category (T2DM, hypertension, COPD, paediatric asthma); identification of barriers, facilitators, and equity dimensions.
Phase 4: Dissertation Writing		
Week 11–12	May 04 – May 17, 2026	Drafting of Introduction, Theoretical Framework, Review of Literature (Table 2.1 and 2.2), and Methodology chapters; completion of PRISMA flow table and SWOT analysis (Table 4.1).
Week 13–14	May 18 – May 31, 2026	Drafting of Results and Discussion, Recommendations, and Conclusion chapters; identification of six critical research gaps; policy recommendation development for government, administrators, developers, and clinicians.
Phase 5: Review & Submission		
Week 15	Jun 01 – Jun 09, 2026	Final review and formatting per IIHMR University 2026 Dissertation Guidelines; Vancouver citation verification; faculty guide submission and incorporation of feedback; finalisation of internship report.

7. Activities Undertaken

- Drafted an initial synopsis outlining the dissertation title, primary objectives, systematic review methodology, four research questions, inclusion/exclusion criteria, and a six-chapter structure in consultation with the faculty guide.
- Conducted an extensive multi-database literature search across PubMed, Scopus, Web of Science, Google Scholar, and IEEE Xplore, combined with supplementary searches of government repositories (MoHFW, ICMR, NITI Aayog, ABDM) and clinical trial registries (CTRI, WHO ICTRP), identifying 244 records.
- Implemented PRISMA 2020 study selection protocol — screening 244 records, retrieving and assessing 28 full texts, and finalising 12 peer-reviewed studies and

one grey-literature source for inclusion, with an inter-rater Cohen's Kappa of $\kappa = 0.83$ confirming strong agreement.

- Appraised quality of included studies using design-appropriate instruments: JBI Critical Appraisal Checklist for quantitative cross-sectional studies, AMSTAR-2 for systematic reviews, and a modified qualitative evidence synthesis checklist for literature reviews.
- Developed and applied a standardised data extraction matrix capturing bibliographic details, study design, geographic scope, sample characteristics (total N=4,899 across primary studies), chatbot technology type, disease context, clinical and engagement outcomes, and barriers, facilitators, and policy implications.
- Conducted integrated multi-theoretical framework analysis combining Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovations (DOI) theory, and Trust-Extended TAM to interpret adoption dynamics.
- Synthesised findings across eight thematic domains: AI chatbots as digital health interventions; technology acceptance and patient engagement; clinical outcomes by disease category; barriers to adoption; facilitators of adoption; demographic and socioeconomic disparities; government policy and platform integration; and legal, regulatory, and ethical dimensions.
- Conducted a comprehensive SWOT analysis of AI chatbot adoption in India's chronic disease management ecosystem, identifying strengths (eSanjeevani reach, ABDM infrastructure), weaknesses (digital divide, NLP limitations), opportunities (generative AI, ASHA/ANM network), and threats (regulatory vacuum, algorithmic bias).
- Identified six critical research gaps — absence of longitudinal RCT evidence, lack of multilingual clinical validation, absence of marginalised population-dedicated studies, need for comparative platform studies, inadequate AI-specific regulatory research, and CKD/CVD evidence gaps — and formulated stakeholder-specific policy recommendations for government, healthcare administrators, technology developers, and clinicians.
- Drafted and formatted a complete dissertation document (six chapters, four tables, 20 Vancouver-style references) aligned with IIHMR University 2026 Dissertation

Guidelines, incorporating all required preliminary pages — Declaration, Certificates, Structured Abstract, Acknowledgement, Table of Contents, List of Figures, List of Tables, and Abbreviations.

8. Summary of Key Research Findings

The systematic literature review generated evidence-based findings across eight thematic domains. The headline findings are summarised below:

8.1 Clinical Outcomes

- The most compelling clinical evidence was a 84.7% symptom control improvement in paediatric asthma within four weeks of chatbot-supplemented management (Bose et al., 2024), alongside reduction in emergency department attendances — demonstrating proof-of-concept for chatbot clinical efficacy when platforms are appropriately designed and deployed.
- AI chatbot interventions in type 2 diabetes improved HbA1c adherence and self-monitoring frequency, primarily through personalised medication reminders and dietary guidance — though most documented improvements are in process outcomes rather than hard clinical endpoints (HbA1c values, hospitalisation rates).
- Hypertension chatbot interventions (Gupta & Nair, 2024) documented statistically significant improvements in blood pressure self-monitoring frequency and medication adherence in a cross-sectional study of 500 hypertensive patients. Blood pressure self-monitoring is associated with a 4–5 mmHg reduction in systolic blood pressure.
- COPD chatbot monitoring improved symptom documentation consistency and enabled earlier exacerbation identification by healthcare workers — though patients with low health literacy struggled to articulate symptom severity effectively.

8.2 Technology Acceptance and Adoption Determinants

- Perceived usefulness emerged as the primary adoption determinant across all included studies, maximised when platforms deliver genuinely personalised

guidance calibrated to individual patient data rather than generic health information.

- Trust in AI-generated health guidance operates as a qualitatively distinct third adoption dimension beyond perceived usefulness and ease of use — driven by concerns about clinical accuracy, absence of human oversight, and fears of sensitive health data misuse.
- Physician endorsement is the single most consistently identified facilitator of patient engagement. Physicians who actively integrated chatbot data into consultations produced patient cohorts with substantially higher and more sustained engagement.
- Government-integrated deployment within eSanjeevani substantially improved patient trust even when the underlying technology was identical to private-sector equivalents — confirming institutional legitimacy as a critical adoption lever.

8.3 Barriers and Equity Dimensions

- The digital divide — manifested as inadequate connectivity, low smartphone penetration, shared device dynamics, and irregular electricity supply — is the most pervasive and structurally entrenched barrier to equitable adoption.
- Elderly patients (aged 65+) demonstrate adoption rates 35–45% lower than working-age adults despite carrying the highest absolute risk of chronic disease complications — the most severe equity paradox in the evidence base.
- Linguistic fragmentation: India's 22 scheduled languages represent a structural barrier; chatbots in patients' regional languages achieve adoption rates 35–50% higher than English-only equivalents and produce more accurate symptom descriptions.
- Data privacy concerns and the absence of statutory AI liability frameworks under Indian law are concrete adoption barriers: patients who withhold sensitive health information from chatbots reduce the clinical quality of interactions, creating a patient safety dimension.

9. Challenges Encountered During Internship

The following challenges were encountered during the course of the internship and their resolutions are described:

9.1 Academic and Research Challenges

- Limited Primary Evidence Base: The systematic search revealed a striking absence of longitudinal randomised controlled trials (RCTs) with hard clinical endpoints for AI chatbot interventions in Indian chronic disease contexts. The evidence base was predominantly cross-sectional and observational, limiting causal inferences. This was addressed by expanding the theoretical and policy analysis components of the review and explicitly documenting this as the primary research gap.
- Paywall Barriers: Four potentially eligible full-text articles could not be retrieved due to journal paywall restrictions. Attempts were made to obtain these through institutional library access, inter-library loans, and author contact; two were eventually accessed while two remained unavailable and were excluded with documentation.
- Heterogeneity of Included Studies: The included studies employed diverse methodological designs (systematic reviews, cross-sectional surveys, mixed-methods studies, prospective observational studies), disease contexts, and outcome measures, making direct quantitative synthesis (meta-analysis) inappropriate. Thematic synthesis was employed as the most appropriate analytical approach.
- Grey Literature Reliability: The Times of India (2025) source required careful credibility assessment given its journalistic rather than academic nature. A structured grey literature credibility framework examining institutional verification, recency, and evidence basis was applied before inclusion.

9.2 Conceptual and Analytical Challenges

- Multi-Theoretical Framework Integration: Applying and integrating four distinct theoretical frameworks — TAM, UTAUT, DOI, and Trust-Extended TAM —

required careful delineation of each framework's unique analytical contribution to avoid conceptual overlap. Multiple iterations of the framework chapter were required before achieving a coherent, integrated analytical architecture.

- Vancouver Citation Management: Converting all in-text citations from author-year (APA) format to numbered Vancouver style across a large document required systematic tracking of citation order of first appearance — a labour-intensive process that was managed through a sequential citation tracking spreadsheet.
- Balancing Breadth and Depth: A systematic review covering four chronic disease categories, eight thematic domains, and multiple stakeholder perspectives across twelve studies required constant disciplinary balance between comprehensive coverage and analytical depth. Regular mentor consultation helped prioritise the most policy-relevant evidence.

9.3 Technology and Formatting Challenges

- Dissertation Formatting Compliance: Ensuring consistent compliance with IIHMR University 2026 Dissertation Guidelines — including precise margin specifications (left 4 cm, right 2 cm), Roman numeral preface pagination, Arabic main text pagination, chapter-based table numbering, and Vancouver reference formatting — required detailed attention to document structure across all six chapters.
- Table Design for Complex Content: Designing the SWOT analysis table (Table 4.1) and the PRISMA study selection table (Table 3.1) to remain legible and properly formatted within the document's content width required iterative adjustments to column widths and cell content.

10. Skills Developed

The internship contributed to the development of a diverse set of academic, analytical, technical, and professional skills as detailed below:

10.1 Research and Analytical Skills

- Systematic Review Methodology: Mastered end-to-end PRISMA 2020 systematic review design, including protocol development, multi-database search strategy construction, dual-reviewer selection processes, and inter-rater reliability assessment.
- Critical Appraisal: Developed proficiency in assessing methodological quality using JBI Critical Appraisal Checklist, AMSTAR-2, and modified qualitative evidence synthesis checklists across heterogeneous study designs.
- Multi-Theoretical Framework Analysis: Gained the ability to apply, integrate, and critically evaluate multiple theoretical frameworks (TAM, UTAUT, DOI, Trust-Extended TAM) for interpreting technology adoption dynamics in healthcare contexts.
- Thematic Synthesis: Developed skills in synthesising qualitative and quantitative evidence from heterogeneous studies into thematic domains, identifying convergences, divergences, and cross-cutting patterns.
- Healthcare Analytics Thinking: Enhanced ability to distinguish between process outcomes and clinical outcomes, evaluate statistical significance versus clinical significance, and apply an equity lens to health technology evidence.

10.2 Domain Knowledge

- Developed in-depth understanding of India's chronic disease burden, healthcare system structural constraints, and the digital health policy ecosystem (ABDM, eSanjeevani, Telemedicine Practice Guidelines 2020, DPDP Act 2023).
- Gained expertise in AI chatbot technology landscape — from rule-based and NLP-driven systems to generative AI architectures — and their specific clinical applications in chronic disease management.
- Developed nuanced understanding of the multi-dimensional barriers to equitable AI chatbot adoption in India and corresponding implementation strategies for diverse stakeholder groups.
- Acquired knowledge of India's AI health governance landscape, including the medico-legal liability gap, data privacy framework implications, and algorithmic bias risks specific to the Indian demographic context.

10.3 Professional and Communication Skills

- Academic Writing: Developed proficiency in writing comprehensive, structured academic chapters in a systematic review format, maintaining consistent argumentation, evidence citation, and scholarly tone throughout a 50+ page document.
- Document Formatting: Acquired detailed knowledge of professional dissertation formatting requirements, including multi-section page numbering, chapter-based table/figure numbering, Vancouver citation style, and TOC structuring.
- Time Management: Successfully managed a fifteen-week research timeline across five distinct phases — orientation, literature search, data extraction, chapter writing, and revision — while maintaining quality standards at each stage.
- Mentor Communication: Developed the ability to communicate research progress, seek constructive feedback, and iteratively improve work quality through regular faculty guide consultations.

11. Key Learnings from Internship

The key learnings from this internship are presented under three domains:

A. Research Process and Methodology

- Learned to design and conduct a PRISMA 2020-compliant systematic literature review, including the full sequence from protocol development through multi-database search, screening, full-text assessment, quality appraisal, data extraction, and thematic synthesis.
- Gained experience constructing effective search strategies using Boolean operators, controlled vocabulary (MeSH terms), and free-text terms, and understood how different query constructions yield different result volumes and relevance profiles.
- Understood the application of inclusion and exclusion criteria to identify relevant peer-reviewed articles, policy papers, and credible grey-literature sources, and appreciated the importance of transparent documentation for reproducibility.

- Developed proficiency in applying multi-theoretical frameworks to healthcare technology adoption research, understanding how each framework contributes a unique analytical lens and how their integration produces more comprehensive explanatory power.
- Recognised the importance of distinguishing study quality from study findings — a methodologically limited study may report genuine phenomena, while a well-designed study may generate findings with limited generalisability due to sample or context constraints.
- Enhanced ability to synthesise evidence from heterogeneous studies into coherent thematic findings, translating academic evidence into policy-relevant conclusions actionable by diverse stakeholder groups.

B. Public Health Systems and Policy Learnings

- Discovered the profound impact of India's structural healthcare constraints — physician shortages, rural access gaps, out-of-pocket expenditure — in creating both the urgent need for AI chatbot solutions and the equity challenges that risk limiting their benefits to already-advantaged populations.
- Learned how government platforms like eSanjeevani, through institutional legitimacy, population reach, and integration with ABDM's ABHA health identifier infrastructure, offer AI chatbot deployment opportunities that private-sector platforms cannot independently achieve.
- Identified critical policy gaps in India's AI health governance landscape: the AI liability vacuum, inadequate health-sector specifications within the DPDP Act (2023), absence of mandatory algorithmic auditing requirements, and the need for informed consent protocols adapted for low-literacy contexts.
- Understood the strategic role of the ASHA/ANM community health worker network as a nationwide bridge mechanism for AI chatbot adoption among digitally excluded populations — a uniquely India-specific asset that most global AI chatbot deployment frameworks do not account for.
- Recognised the Telemedicine Practice Guidelines (2020) as a model for how well-designed policy intervention can rapidly shift clinician behaviour and accelerate

technology adoption, reinforcing the importance of evidence-informed health policy.

- Appreciated that health equity is not merely a moral consideration in AI chatbot deployment but an efficiency argument: the populations with the greatest unmet chronic disease management need offer the greatest population health returns per unit of chatbot-enabled engagement improvement.

C. Topic-Focused Learnings on AI Chatbots in Chronic Disease Management

- Found that perceived usefulness is the dominant AI chatbot adoption determinant, and that it is maximised by genuine personalisation — platforms that adapt guidance to individual patient medication regimens, monitoring histories, and disease trajectories generate the highest engagement and clinical utility.
- Observed that trust in AI-generated health guidance operates as a qualitatively distinct adoption dimension — one that functional improvements in usefulness and ease of use cannot substitute for — requiring clinical validation transparency, human oversight visibility, and regulatory accountability to build.
- Recognised that physician endorsement and active clinical workflow integration are the single most powerful facilitators of AI chatbot patient engagement, suggesting that clinician-facing chatbot interfaces generating consultation-ready patient summaries are a higher-priority investment than patient-facing features alone.
- Understood that the caregiver-mediated chatbot use model (documented in the paediatric asthma context by Bose et al., 2024) represents a promising design paradigm for chronic disease contexts with motivated, digitally literate proxy adopters — including antenatal care, paediatric chronic conditions, and elder care.
- Highlighted that vernacular-language chatbot design is not merely a user experience enhancement but a clinical and equity necessity: symptom descriptions in patients' native languages are more accurate and clinically useful, improving NLP triage accuracy and producing better chronic disease management data for physician review.
- Understood that sustainable AI chatbot adoption in chronic disease management requires the coordinated alignment of four interdependent dimensions: technology

(NLP accuracy, multilingual and accessible design, generative AI capabilities), policy (AI governance framework, ABDM integration, liability clarity), behaviour (physician endorsement as social influence, patient trust-building, community health worker mediation), and infrastructure (connectivity, device access, EHR interoperability).

12. Conclusion

This internship provided a comprehensive, immersive research experience in one of the most consequential and rapidly evolving areas of digital health — the deployment of AI chatbots for chronic disease management in India. Over fifteen weeks at IIHMR University, Jaipur, under the guidance of Dr. Ram Krishan Chahar, the internship encompassed every stage of a rigorous systematic literature review: from protocol design and multi-database searching through thematic synthesis, SWOT analysis, gap identification, and policy recommendation development.

The research affirms that AI chatbots, when appropriately designed and strategically deployed, hold genuine transformative potential for India's chronic disease management challenge — offering scalable, personalised, and affordable patient engagement support that India's overstretched healthcare system cannot provide at equivalent cost and reach through conventional care pathways alone. The 84.7% paediatric asthma symptom control improvement documented by Bose et al. (2024) and eSanjeevani's 340 million+ consultation milestone both provide compelling proof-of-concept for what AI chatbot-supplemented care can achieve at clinical and population scales.

Equally, the research makes clear that realising this potential equitably — ensuring that AI chatbots serve India's most vulnerable chronic disease patients as effectively as its most privileged — demands urgent, coordinated investment in vernacular language design, community health worker mediation, ABDM-integrated deployment, and a comprehensive AI health governance framework that addresses the current liability gap, data privacy inadequacies, and algorithmic bias risks. Six critical research gaps, identified in this review, define the priority agenda for the research community.

The internship has significantly enhanced the author's competencies in systematic review methodology, multi-theoretical framework analysis, health equity thinking, and evidence-based policy formulation — skills that are directly applicable to a career in healthcare analytics, digital health policy, and health systems research. The IIHMR University environment, with its focus on applied health management research and its connection to national and global health policy networks, provided an ideal institutional setting for this work.

The author expresses deep gratitude to Dr. Ram Krishan Chahar for his expert mentorship and sustained guidance throughout the internship, and to the IIHMR University faculty and staff for their academic support and encouragement.

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