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AI-Driven Mental Health Support in Low-Resource Settings: Comparative Lessons from Nigeria, Nepal, and Ecuador

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Abstract

As chronic illnesses increasingly intersect with mental health disorders in developing countries, conventional healthcare systems remain ill-equipped to respond to this dual crisis. This paper explores the adoption of AI-enabled mental health interventions for chronic illness in developing countries, drawing comparative insights from Nigeria, Nepal, and Ecuador. Using a document-based qualitative methodology, it analyses the extent, effectiveness, and barriers associated with digital mental health innovation across varying levels of technological maturity. Nigeria demonstrates the most advanced integration, particularly in clinical psychology, with AI tools for diagnosis, therapeutic support, and remote monitoring. However, it is challenged by clinician resistance and ethical concerns. Nepal, while focused more broadly on AI in healthcare, reveals early signs of readiness for mental health applications, constrained by infrastructural and contextual localization gaps. Despite limited AI deployment, Ecuador highlights the importance of digital literacy and legal frameworks through its telemedicine experience. The findings reveal that AI's promise is not merely technical but profoundly human, shaped by culture, policy, education, and trust. True adoption requires more than innovation; it demands ethical alignment, systemic investment, and localized design. This paper provides a strategic roadmap for global AI health equity, outlining policy, training, and research priorities to scale AI-enabled mental health interventions for chronic illness care responsibly. In doing so, it contributes a rare South-South comparative perspective, one that is urgently needed to reimagine the future of digital health in underserved communities.

Keywords: Artificial Intelligence, Mental Health, Chronic Illness, Developing Countries, Digital Health Adoption

1. Introduction

Mental health conditions associated with chronic illnesses such as diabetes, hypertension, and cardiovascular disease are on the rise globally, and developing countries face

disproportionate challenges in managing this dual burden. In low-resource settings, these challenges are compounded by inadequate infrastructure, scarcity of specialized professionals, social stigma, and fragmented healthcare delivery systems (Onyemaechi et al., 2025). The advent of Artificial Intelligence (AI) presents an opportunity to bridge systemic gaps by enabling early detection, personalized care, and scalable interventions in mental health care. AI technologies such as machine learning (ML), natural language processing (NLP), and intelligent decision-support systems have shown promise in enhancing diagnostic accuracy and facilitating remote therapeutic engagement, capabilities particularly crucial for managing chronic illness-related psychological disorders (Ajadalu et al., 2024; Oladimeji et al., 2024). In Nigeria, the integration of AI into clinical psychology has demonstrated the potential to support diagnosis, offer real-time emotional analysis, and enable therapeutic interventions even in underserved areas (Onyemaechi et al., 2025). This is a significant development in a context where mental health services are chronically underfunded and heavily stigmatized.

In Nepal, although AI adoption is still in its early stages, its role in healthcare is gaining attention. AI is currently being used in diagnostic imaging, triage systems, and mobile applications such as chatbots for public health information. These technologies, while not exclusively focused on mental health, offer foundational tools that could be adapted for chronic illness-related psychological care (Shankar, 2022). AI-enabled systems like Ubenwa a mobile app that detects birth asphyxia through newborn cries, and AI-based diabetic eye screening tools highlight the country's growing experimentation with AI technologies in healthcare delivery. While Ecuador's healthcare system is not yet heavily invested in AI, its experience with telemedicine during recent years provides valuable insights into the digital readiness of healthcare providers. A study assessing the perceptions of Ecuadorian physicians revealed a significant lack of familiarity with telemedicine tools, despite general awareness of their cost-reduction potential (Cherrez-Ojeda et al., 2023). Notably, over 80% of respondents emphasized the need for strong data protection frameworks and legal clarifications on issues that are equally critical in AI-enabled systems (Cherrez-Ojeda et al., 2023).

The use of digital health technologies, whether AI-based or telemedicine-driven, has far-reaching implications for managing mental health among patients with chronic illnesses. However, barriers such as resistance to change, concerns over data privacy, and lack of contextual adaptation of AI models persist across countries (Kenku & Uzoigwe, 2024; Alia et al., 2022). These challenges underline the importance of designing culturally sensitive, ethically grounded, and practically feasible AI solutions for mental health care. This paper explores how Nigeria, Nepal, and Ecuador, three developing nations with distinct health system profiles, are engaging with AI or digital health technologies in mental health care. By examining their respective journeys, the study aims to identify transferable lessons, contextual

challenges, and strategic opportunities for national-level adoption of AI-enabled mental health interventions for chronic illness management.

2. Objectives

- To examine how AI is being used for mental health interventions in the context of chronic illness.
- To compare adoption levels and challenges across Nigeria, Nepal, and Ecuador.
- To provide recommendations for national-level AI health policy design and implementation.

3. Related Work

The intersection of artificial intelligence (AI), mental health, and chronic illness management has attracted increasing scholarly interest, particularly in the context of healthcare systems in developing countries. Numerous studies underscore the transformative potential of AI to address critical gaps in access, diagnosis, and continuity of care in mental health services (Odunuga et al., 2024). Machine learning algorithms, for instance, can analyze vast datasets from electronic health records, therapy transcripts, and behavioral patterns to detect psychological disorders early and suggest targeted interventions (Ajadalu et al., 2024). These systems are particularly valuable in managing chronic illnesses where mental health comorbidities often go undiagnosed due to time constraints or a lack of trained professionals. In Nigeria, Onyemaechi et al. (2025) highlight the integration of AI into clinical psychology, where it is being explored as a tool for therapeutic support and continuous patient monitoring.

AI applications such as chatbots and virtual therapists offer scalable solutions for mental health service delivery, especially in underserved and rural communities. These technologies support patient engagement outside traditional clinical settings, reduce therapist burden, and allow for more personalized treatment pathways. However, ethical concerns, particularly surrounding data privacy, algorithmic bias, and accountability in the event of misdiagnosis, remain pressing issues (Ejidike et al., 2023). Empirical studies in Nepal provide a broader healthcare perspective. According to Shankar (2022), while AI adoption is limited, there is a growing awareness of its potential in diagnostics and healthcare efficiency. AI is used in non- mental health domains such as breast and cervical cancer grading and gastrointestinal lesion detection, with implications for mental health in terms of reduced system burden and earlier interventions. Nonetheless, the absence of widespread electronic health record (EHR) systems and the lack of digital infrastructure constrain the utility of AI in mental health care. Panch et al. (2019), cited in the same context, stress the importance of data quality, informed consent, and equitable sharing of benefits derived from health data monetization.

Ecuador's engagement with digital health has centered on telemedicine, serving as a precursor to AI deployment. Cherrez-Ojeda et al. (2023) conducted a cross-sectional survey involving 382 healthcare providers and revealed significant gaps in knowledge and confidence regarding digital health tools. Notably, while physicians acknowledged the potential of telemedicine to reduce healthcare costs and improve accessibility, concerns regarding patient data confidentiality and malpractice liability were prominent. These findings mirror global patterns where technological optimism is often tempered by professional apprehension and infrastructural deficiencies (Nguyen et al., 2019; Espinoza et al., 2023). The psychological dimension of AI adoption, particularly resistance to technological change, has also been explored. Kenku and Uzoigwe (2024) describe "AI anxiety" as a growing phenomenon in Nigeria, where healthcare workers express concern over job displacement and diminishing autonomy. This psychological barrier is echoed in broader empirical literature, which identifies gender, experience level, and institutional support as determinants of receptivity to AI tools (Odunuga et al., 2024; Orrù et al., 2024).

While the academic discourse strongly supports the integration of AI in healthcare, there is consensus that its success hinges on socio-technical alignment. As highlighted by Tang et al. (2018), effective AI integration requires multidisciplinary collaboration, robust legal frameworks, and the inclusion of AI literacy in medical education. These insights are particularly relevant for low- and middle-income countries, where digital transformation must contend with constrained budgets, political instability, and systemic inequities. The existing body of work illustrates a growing, albeit uneven, interest in using AI for mental health and chronic disease management across developing countries. While Nigeria appears to be advancing toward AI-driven mental health care, Nepal remains in a preparatory phase, and Ecuador demonstrates the foundational challenges of digital health adoption. The literature points to a critical need for contextualized strategies that address ethical, infrastructural, and psychological dimensions of AI integration in health systems.

4. Methodology

This study employed a qualitative comparative analysis approach using document-based research to examine the adoption of AI-enabled mental health interventions for chronic illness in three developing countries: Nigeria, Nepal, and Ecuador. The methodology centered on the thematic analysis of three primary documents, each representing one country, augmented by scholarly references embedded within those documents. This method was chosen to synthesize cross-national insights from differing stages of digital and AI health integration, ranging from advanced AI trials to foundational telemedicine adoption.

4.1 Data Sources and Selection Criteria

The primary data sources include:

- Onyemaechi et al. (2025) for Nigeria, which extensively explores AI integration in clinical psychology.
- Shankar (2022) for Nepal, a national overview of AI in healthcare.
- Cherrez-Ojeda et al. (2023) for Ecuador, which investigates physician attitudes towards telemedicine.

These documents were selected based on three criteria:

1. National focus on a developing country.
2. Inclusion of mental health concerning chronic illness or AI.
3. Empirical data or structured literature discussion of AI or digital health technologies.

4.2 Analytical Framework

The analysis followed a deductive thematic coding structure guided by three main dimensions:

- Technological Readiness: Infrastructure, EHR adoption, AI applications;
- Clinical Integration: Specific references to mental health or chronic illness use cases;
- Ethical and Sociocultural Barriers: Professional resistance, data privacy, patient autonomy.

Country-specific content was analyzed using this coding frame to allow for structured comparison. For instance, Nigeria was coded as having high relevance in all three dimensions, particularly about AI anxiety and diagnostic support (Onyemaechi et al., 2025; Odunuga et al., 2024). Nepal scored moderately, with innovation in general healthcare AI but limited direct applications to mental health (Shankar, 2022). Ecuador's document primarily addressed the baseline issues of telemedicine knowledge, which served as a proxy for digital health readiness (Cherrez-Ojeda et al., 2023).

4.3 Data Representation and Diagrams

Quantitative summary data embedded in the documents were extracted and visualized as simplified bar charts to compare key indicators across countries:

- Figure 1: AI effectiveness scores in Nigeria (adapted from Onyemaechi et al., 2025)
- Figure 2: AI implementation levels in Nepal (adapted from Shankar, 2022)

- Figure 3: Telemedicine familiarity and privacy concerns in Ecuador (based on Cherrez-Ojeda et al., 2023)

These charts were compiled in an Excel-compatible format to aid transparency and reproducibility.

4.4 Limitations

As a document-based comparative study, this research is inherently limited by the scope, date, and depth of the selected publications. Some countries, such as Nepal and Ecuador, lack detailed breakdowns of AI-specific outcomes in mental health, necessitating inferential comparisons. Furthermore, the documents vary in methodological rigor: for example, Ecuador's data comes from a structured survey (Cherrez-Ojeda et al., 2023), while Nepal's and Nigeria's rely more heavily on literature synthesis and expert commentary (Shankar, 2022; Onyemaechi et al., 2025).

In addition to these constraints, the study is subject to bias risks commonly associated with secondary data analysis. By relying on published sources, the research may overlook community-level innovations, informal mental health interventions, or grassroots AI applications that are not captured in peer-reviewed or institutional literature. This introduces a potential selection bias, privileging more formal, documented programs over potentially impactful local or indigenous practices. Similarly, the reliance on country-level sources may result in overrepresentation of urban or academic perspectives, while underrepresenting rural, community-based experiences with AI or digital mental health tools.

Another source of bias stems from publication timelines. Since the selected documents range from 2022 to 2025, they may not fully reflect the most current implementations or rapidly evolving AI pilots in these countries. Lastly, the interpretive nature of thematic coding may be influenced by the researchers' own contextual familiarity or professional orientation, reinforcing the need for future triangulation with field interviews, policy documents, and implementation data.

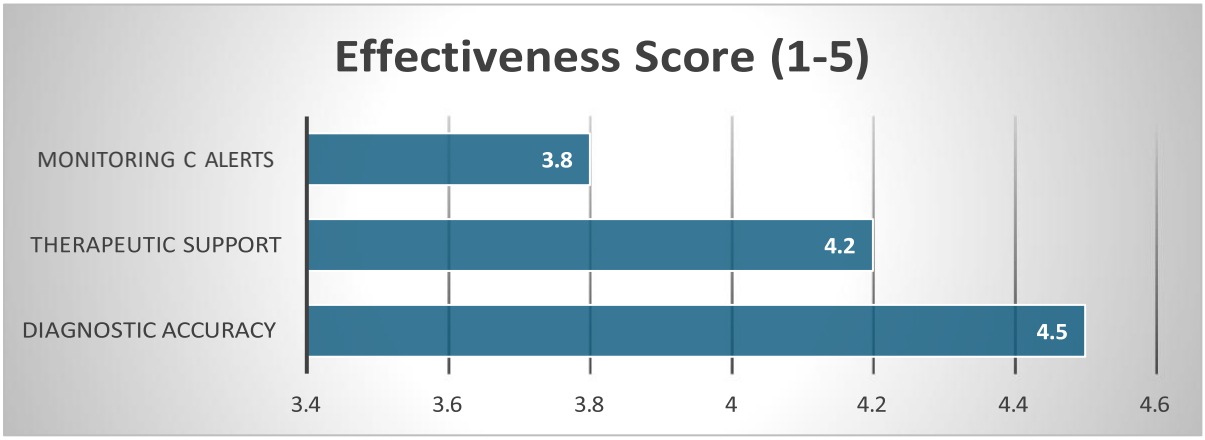
5. Data Analysis and Findings

5.1 Nigeria: Clinical Psychology and AI

In Nigeria, the adoption of AI in clinical psychology is advancing steadily, especially in addressing mental health challenges associated with chronic illness. According to Onyemaechi et al. (2025), AI-powered systems such as Decision Support Systems (DSS), chatbots, and virtual therapists are already being piloted to assist in diagnosis, therapy personalization, and remote monitoring of psychological conditions. The applications of

machine learning (ML) and natural language processing (NLP) are particularly notable in areas such as speech pattern analysis, emotional tracking, and real-time behavioral assessment. As illustrated in Figure 1, AI applications in mental health in Nigeria are rated highly in terms of perceived effectiveness. Diagnostic accuracy received the highest score at 4.5 out of 5, followed by therapeutic support at 4.2, and continuous monitoring at 3.8. These scores reflect strong clinical optimism for AI's value in enhancing the quality and reach of mental health services. However, concerns remain regarding clinician resistance, AI anxiety, and infrastructural readiness. Odunuga et al. (2024) and Kenku & Uzoigwe (2024) report persistent fears about job security, loss of clinical autonomy, and unease with algorithmic decision-making. Additionally, ethical concerns such as data privacy, algorithmic fairness, and liability in cases of misdiagnosis (Ejidike et al., 2023) must be resolved to ensure trust in AI tools.

Figure 1: Nigeria data

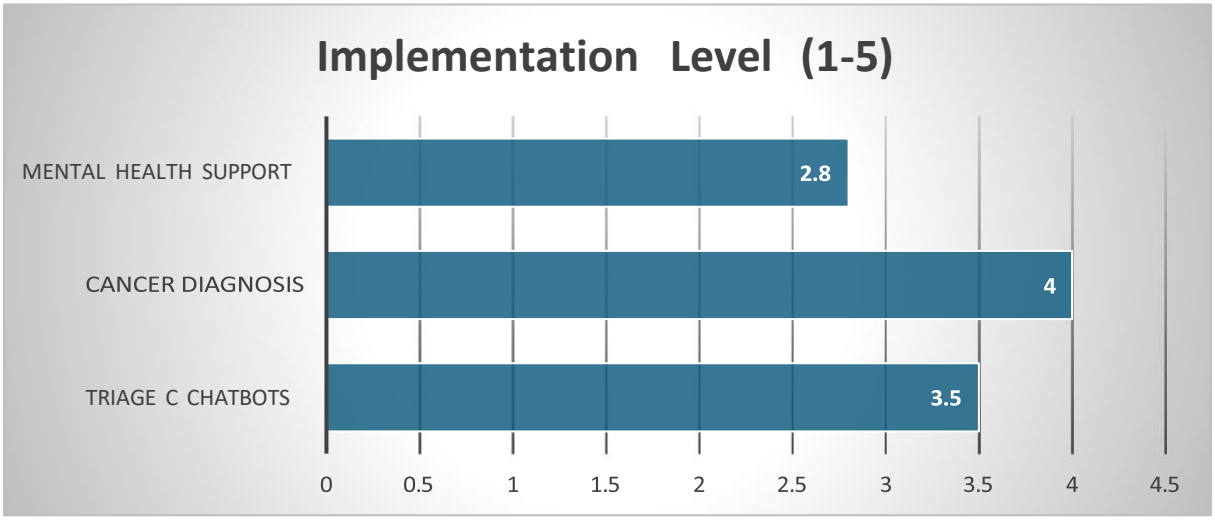


5.2 Nepal: General AI in Healthcare with Mental Health Implications

Nepal's approach to AI in healthcare remains experimental, with early applications primarily focused on general diagnostics and public health, rather than direct mental health interventions. Shankar (2022) notes significant progress in using AI for grading breast and cervical cancers, implementing triage chatbots during the COVID-19 pandemic, and piloting diagnostic automation tools. While these innovations indirectly support the healthcare ecosystem, freeing up clinician time and improving early detection, they have not yet been systematically extended to mental health care, especially in chronic illness contexts. Figure 2 depicts Nepal's AI implementation levels across three domains. Cancer diagnosis leads with a score of 4.0 out of 5, followed by triage/chatbot tools at 3.5, and mental health support with a notably lower score of 2.8. The low score for mental health AI support reflects the current gap in addressing chronic illness-linked psychological conditions, such as diabetic distress or cardiac-related depression, through digital means. Barriers include limited access to electronic health records (EHRs), lack of algorithmic localization for Nepal's ethnolinguistically diverse

population, and the absence of comprehensive regulatory frameworks (Gijsberts et al., 2015). Furthermore, chronic illness patients often lack consistent mental health follow-up due to these infrastructural weaknesses, making AI's potential role in remote mood monitoring and patient triage especially critical. Nevertheless, the foundational elements are emerging, and there is growing advocacy for incorporating AI and health informatics into medical education to support long-term integration (Tang et al., 2018).

Figure 2: Nepal data



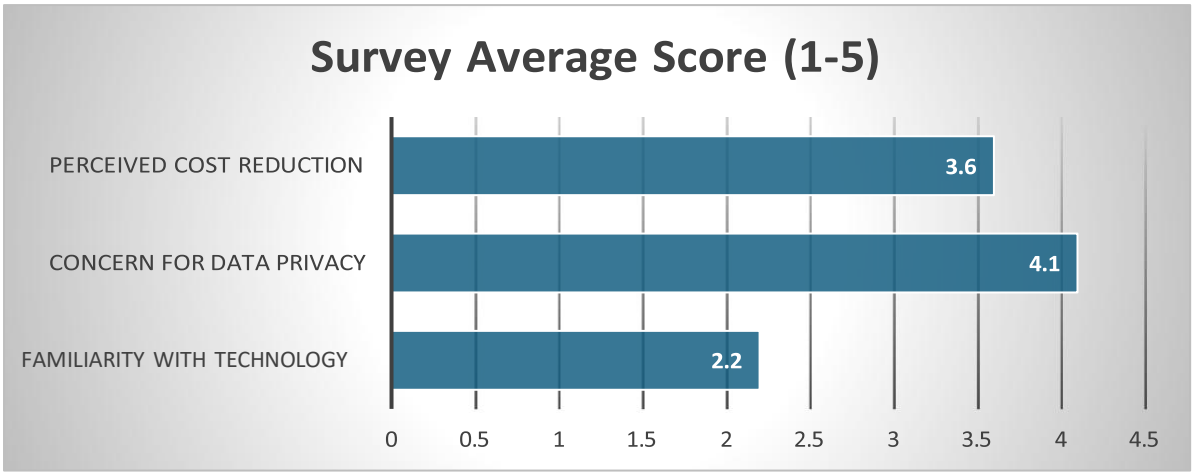
5.3 Ecuador: Digital Health Readiness via Telemedicine

A Although Ecuador has not yet deployed AI in mental health care, its experience with telemedicine offers valuable insights into digital health infrastructure and cultural readiness. Cherrez-Ojeda et al. (2023) surveyed 382 physicians and found that a majority had limited exposure to telemedicine technologies. This is particularly concerning given the high burden of chronic conditions such as diabetes and hypertension in Ecuador, where psychological distress is common and poorly managed in routine care. Without scalable mental health solutions for these patients, the full potential of chronic illness management is compromised.

Nonetheless, there was a shared belief in its potential to improve cost efficiency and patient reach, provided that legal and ethical concerns, especially around data privacy, are addressed. This belief opens a strategic window for integrating AI tools specifically designed for chronic illness-associated mental health care such as depression screeners embedded in remote diabetes management platforms or AI triage assistants for hypertensive patients reporting anxiety or mood issues.

Figure 3 presents the average scores of Ecuadorian physicians on key telemedicine dimensions. Familiarity with technology scored 2.2 out of 5, reflecting a significant knowledge gap among clinicians. Concern for data privacy scored 4.1, indicating a high level of sensitivity to security risks. The perceived potential for cost reduction scored a moderate 3.6. These findings suggest that before Ecuador can deploy AI-enabled mental health interventions for chronic illness, foundational literacy and legal reforms must be prioritized especially in primary care settings where chronic illness and comorbid depression often first present.

Figure 3: Ecuador data



6. Discussion

The cross-country analysis of Nigeria, Nepal, and Ecuador reveals a spectrum of progress and challenges in adopting AI-enabled interventions for mental health care, particularly in the management of chronic illness. These findings underscore that while the potential of AI is universally recognized, the pathway to implementation is highly context-dependent, shaped by sociocultural, infrastructural, legal, and educational factors. Nigeria stands out as the most advanced among the three in integrating AI specifically into mental health care. The relatively high effectiveness scores observed in diagnostic accuracy (4.5), therapeutic support (4.2), and monitoring (3.8) suggest that Nigerian clinical psychologists and healthcare institutions are exploring AI tools beyond theoretical interest and into applied use. However, the discussion in Onyemaechi et al. (2025) and Odunuga et al. (2024) makes it clear that this progress is tempered by professional resistance and "AI anxiety," a psychological barrier rooted in fear of job loss, mistrust of algorithmic decisions, and discomfort with rapidly changing technological norms. Ethical concerns about algorithmic bias and data misuse remain acute, especially given the absence of national AI governance frameworks (Ejidike et al., 2023). These tensions illustrate the dual challenge of technological optimism and institutional inertia. If not carefully managed, such anxiety could stall or even reverse adoption efforts.

In contrast, Nepal reflects a more generalized but indirect approach to AI in healthcare. Although mental health-specific applications are still limited, reflected in a low score of 2.8 for mental health AI support, the country's work in diagnostic imaging, triage tools, and mobile applications sets a solid foundation for future mental health innovations (Shankar, 2022). The moderate scores for AI in triage/chatbots (3.5) and firm performance in cancer diagnosis (4.0) indicate that the country has embraced AI in practical, system-relevant roles, particularly during the COVID-19 pandemic (Banerjee et al., 2020). However, the absence of widespread electronic health records and the lack of localized algorithm development constrain the broader integration of AI in mental health. The need to ensure cultural and linguistic sensitivity in AI systems is especially pressing in Nepal due to its ethnic diversity, a factor emphasized by Gijsberts et al. (2015) concerning algorithmic fairness. Moreover, Shankar (2022) argues that while AI holds promise, its success depends on simultaneous reforms in medical education, public trust, and regulatory safeguards. These insights point toward the need for long-term, interdisciplinary investment rather than short-term technical fixes.

Ecuador, while not actively implementing AI in mental health, provides valuable lessons on system readiness and the importance of digital literacy. The stark contrast between the low average familiarity with telemedicine (2.2) and the high concern for data privacy (4.1) signals a misalignment between technological ambition and professional preparedness (Cherrez-Ojeda et al., 2023). Interestingly, the relatively positive score for perceived cost reduction (3.6) reflects openness among clinicians to the financial benefits of digital tools, suggesting that economic arguments may be persuasive in driving digital health uptake. However, as noted by Espinoza et al. (2023), adoption is unlikely to succeed without clear legal structures, formal training, and ongoing support systems. Ecuador’s experience shows that digital health transformations must start with building trust and competence among frontline providers, preconditions without which AI implementation would likely falter.

Across all three countries, common threads emerge. First, there is a shared recognition that AI should enhance, not replace, human clinical judgment. This is particularly important in mental health care, where therapeutic relationships, empathy, and contextual understanding are irreplaceable. Second, data privacy, algorithmic bias, and the need for ethical frameworks were recurrent themes. In each case, the absence of robust national AI strategies was identified as a limiting factor, confirming global concerns about uneven governance in AI health applications. Third, education and training emerged as pivotal. Whether it is the need for clinician familiarity in Ecuador, AI literacy in Nepal’s medical curriculum, or resistance mitigation in Nigeria, human capacity-building is central to successful AI integration. This discussion reinforces that AI is not a silver bullet but a complex tool that must be thoughtfully embedded into existing health systems. Its success depends not only on technical capabilities

but also on sociopolitical acceptance, ethical oversight, and institutional adaptation. As such, developing countries must adopt a systems-thinking approach that considers infrastructure, policy, culture, and human behaviour as integral parts of AI health innovation.

7. Recommendations

The successful adoption of AI-enabled mental health interventions for chronic illness in developing countries requires more than technological availability—it demands a holistic, multisectoral, and systems-based strategy. Based on the comparative analysis of Nigeria, Nepal, and Ecuador, this section presents a roadmap for sustainable implementation across five interdependent domains: policy, infrastructure, human resources, research, and public engagement.

In the domain of policy, national governments must develop context-specific regulatory frameworks that articulate clear ethical, legal, and operational standards for AI integration in mental health care. These policies must address fundamental issues such as data privacy, algorithmic accountability, and liability for malpractice, while also providing structured pathways for the approval, evaluation, and scale-up of AI-driven health solutions. Countries already experimenting with clinical AI, like Nigeria, must institutionalize these efforts through formal regulations that legitimize innovation and instill public trust. In contrast, nations such as Nepal and Ecuador—where policy ecosystems are still emerging—must prioritize legal clarity before undertaking broader AI deployments in mental health systems.

Equally critical is the development of infrastructure capable of supporting secure, scalable, and equitable digital health ecosystems. Reliable internet connection remains a prerequisite, particularly in rural and underserved regions where the burden of chronic illness and mental health challenges is often greatest. The establishment of interoperable electronic health record systems, paired with secure and accessible cloud-based data storage platforms, is essential for managing sensitive mental health data. However, infrastructure planning must go beyond hardware and bandwidth; it must consider sociocultural barriers such as language, digital access, and public skepticism, all of which can influence trust in AI-driven care.

The human dimension of AI adoption, reflected in human resource development, cannot be overstated. A future-ready health workforce must be digitally fluent and capable of working alongside intelligent systems. To this end, educational institutions should embed AI, health informatics, and digital ethics into the curricula for medicine, psychology, nursing, and public health at both undergraduate and postgraduate levels. Structured professional development programs will be particularly valuable in contexts like Nigeria, where healthcare workers have expressed anxiety over the perceived threat of AI to their autonomy and job security. Tailored training initiatives, such as certification in the use of decision-support systems or mental health

chatbots, should be accompanied by interdisciplinary mentorships that bridge clinical and technological expertise, fostering a culture of collaboration rather than resistance.

In the realm of research, locally driven inquiry is essential to ensure that AI tools are safe, effective, and culturally relevant. National health systems must invest in pilot studies and real-world implementation trials that assess the clinical impact of AI on chronic illness-related mental health outcomes. Moreover, research must go beyond clinical efficacy to examine critical issues such as algorithmic bias, trustworthiness, and inclusivity. The creation of dedicated AI health research hubs can accelerate progress by coordinating data collection, model testing, and stakeholder feedback. For countries like Nepal and Ecuador, where the availability of diverse and representative data remains limited, the development of open-access datasets inclusive of marginalized populations is an urgent priority.

Finally, long-term success hinges on public engagement and societal readiness. Communities must not only understand what AI is but also feel empowered to question and shape how it is used in healthcare. Public education campaigns should demystify AI by explaining its purpose, benefits, and limitations in accessible language, while emphasizing the safeguards in place to protect patient privacy and human oversight. Success stories, local champions, and culturally resonant media narratives can help normalize the use of AI in mental health care and reduce stigma. Additionally, establishing community advisory panels ensures that AI systems reflect the values, concerns, and lived experiences of the populations they serve. In culturally diverse environments like Nepal, such engagement must be multilingual and inclusive, avoiding the marginalization of linguistic or ethnic minorities.

8. Future Research Directions

The next frontier of mental health care in low-resource settings will be shaped not only by the advancement of artificial intelligence, but by our ability to ask the right questions, with the right tools, in the right contexts. As AI-enabled interventions grow in complexity and reach, future research must evolve into a multidisciplinary, participatory, and future-focused endeavor. The following directions outline a bold research agenda that pushes beyond proof-of-concept into the realm of sustainable, equitable, and human-centered innovation.

First and foremost, there is an urgent need for mixed-methods research that unites clinical trial rigor with deep human insight. Quantitative measures such as symptom reduction, medication adherence, or relapse rates must be complemented by qualitative inquiry into lived experiences, emotional response, and the social dynamics of AI-enabled care. In-depth interviews, participatory action research, and digital storytelling should be embedded within AI evaluation frameworks to illuminate issues of trust, stigma, empowerment, and cultural resonance which are factors that numbers alone cannot capture.

Equally important is the development and testing of mobile-first, low-literacy-friendly AI tools. Many individuals in Nigeria, Nepal, and Ecuador access the internet exclusively via mobile devices and often lack high levels of digital or health literacy. Future research should focus on creating AI-driven mental health companions that use voice-based interaction, multilingual audio prompts, gamified check-ins, and visual interfaces with emojis or culturally symbolic icons to facilitate access for vulnerable or marginalized groups. These tools can be particularly impactful in adolescent and elderly populations, who may be underserved by current models.

As AI systems become more integrated into chronic care pathways, researchers should investigate the longitudinal impact of these technologies not just on mental health outcomes, but on broader dimensions such as social reintegration, economic productivity, caregiving burdens, and intergenerational health resilience. What does it mean for a patient with diabetes and depression in a rural village to interact daily with a compassionate AI-based support agent? How might that change their identity, agency, or treatment expectations over time? Future studies must engage with these complex sociotechnical questions.

In parallel, research must also explore futuristic innovations that are currently emerging at the edge of global health AI. For example, emotionally adaptive AI systems which can detect, interpret, and respond to patient mood changes in real-time offer immense potential for mental health monitoring in chronically ill patients. Studies should examine the efficacy, safety, and ethical implications of deploying such systems in environments where human therapists are scarce.

Another promising area is the development of AI-powered digital twins, virtual replicas of patients that simulate their physiological and psychological responses to interventions. These twins could enable personalized mental health simulations and care planning in a low-cost, scalable manner. Research must assess how feasible such approaches are in low-resource health systems and how well they can integrate into existing care models without displacing human judgment or empathy.

In addition, cross-border federated learning networks which allow AI models to be trained on decentralized data without transferring sensitive patient records could help build more globally inclusive algorithms. Researchers should evaluate how these collaborative AI architectures can be ethically and technically implemented in the Global South, particularly in mental health domains where data scarcity and privacy concerns coexist.

Addressing algorithmic bias and fairness remains a critical line of inquiry. Many existing AI models have been trained on datasets from high-income countries and are therefore not culturally or clinically transferable to LMIC contexts. Future research must develop and validate locally relevant AI models using diverse, community-informed datasets, with special

attention to linguistic, gender, and ethnic variation. Studies should also investigate how these models perform across urban-rural divides and whether they exacerbate or mitigate systemic inequities.

Finally, the success of AI in mental health will depend on how well it is governed. Research must delve into the design of regulatory sandboxes, AI oversight bodies, and patient-centered ethics frameworks in developing countries. Studies should explore questions such as: What are the culturally appropriate models of informed consent in AI mental health systems? Who bears responsibility when an AI recommendation leads to harm? What does algorithmic transparency mean in a multilingual, low-literacy context?

9. Conclusion

Artificial intelligence is poised to transform mental health care but its true value will be measured not by the sophistication of its algorithms, rather by its capacity to reach those most in need. This study has examined the pathways through which AI-enabled mental health interventions are emerging across three distinct yet interconnected low-resource contexts: Nigeria, Nepal, and Ecuador. While each country presents a different stage of digital readiness, a shared lesson resounds that chronic illness remains a critical inflection point where physical and psychological burdens intersect, often silently and severely. In these settings, AI offers an unprecedented opportunity to close long-standing care gaps, particularly in mental health support for individuals facing lifelong disease trajectories.

Nigeria demonstrates early promise, with AI tools entering therapeutic spaces and clinical psychology practices although it is still hindered by ethical ambiguity and professional resistance. Nepal illustrates foundational momentum through its diagnostic innovations, while Ecuador's case highlights the preconditions for digital trust and system-wide readiness. Together, these experiences reflect a global truth that the future of AI in health care cannot be decoupled from policy, infrastructure, human expertise, research integrity, and cultural humility. It is not technology alone that heals, but the systems and values that steward its use.

As nations navigate the complexities of AI integration in mental health care, particularly within chronic illness management, this study offers a blueprint not just for implementation, but for transformation which emphasizes that the most powerful technologies are not those that replace the healer, but those that extend the healing hand. Or, as an old African parable wisely puts it: *"The fastest path is not always the straightest; the path that bends to understand the land will endure."* In the journey to reimagine mental health through AI, let us bend with purpose and build with care.

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