

Designing a Virtual Community of Practice for Frontline Disability Workers in India

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Abstract

Healthcare systems in resource-constrained settings face critical shortages of skilled workers, particularly in remote areas where Community Health Worker (CHW) programs aim to fill the gap. While digital interventions have attempted to address professional development needs, they often fail to account for workers' diverse technological access and learning preferences. Through a seven-month collaboration with an Indian health network, we engaged 30 Community-Based Inclusive Development (CBID) workers to design and evaluate a digital peer support service combining WhatsApp and Interactive Voice Response. Our findings reveal how institutional structures, cultural learning preferences, and varying digital literacy levels shape engagement with peer learning platforms. We contribute design recommendations for healthcare-focused peer learning services that: (1) leverage institutional ecosystems to legitimize peer learning, (2) implement structured facilitation aligned with cultural preferences, and (3) accommodate diverse digital competencies through adaptive technical support.

CCS Concepts

• **Human-centered computing** → **Empirical studies in collaborative and social computing.**

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1 Introduction

In rural and resource-constrained settings, distributed healthcare workers serve as the backbone of essential care delivery to underserved populations. These workers face unique challenges due to their geographic isolation, limited access to institutional support, and increased workload as they are often the sole providers of crucial health services in their areas. The complexity of their roles is further compounded by infrastructural gaps and varying levels of technological access, highlighting the need for innovative approaches to support their professional development and collaboration.

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Our study focuses on Community-Based Inclusive Development (CBID) workers employed by the Emmanuel Hospital Association in rural India. These workers support individuals with disabilities within their local communities, a population of over 26.8 million in India. While prior work has explored digital tools ranging from mobile platforms to audio-visual aids, these solutions often fail to accommodate diverse levels of digital literacy and overlook the complexities of local healthcare practices in rural areas.

To address these limitations, we explored the use of a peer learning service, adopting a Virtual Community of Practice (VCoP) model as the foundation for our support system. Through workshops, a pilot implementation, and interviews, we examined how distributed healthcare workers can be supported by peer learning systems that focus on contextual relevance, usability, and addressing local challenges. Our research was guided by the following questions:

- What challenges do health workers in distributed geographical contexts face around professional development and learning?
- How do community health workers prefer to access professional development and peer support?
- What sociotechnical processes can facilitate greater participation in peer-led professional development?

2 Methods

We employed a multi-phase approach to design and evaluate a peer learning service for CBID workers. Our study consisted of three key phases:

2.1 Phase 1: Discovery Workshops

We conducted three workshops with experienced CBID workers to understand their professional challenges and learning needs. These workshops explored six key themes related to healthcare delivery and professional development in rural settings. Participants engaged in brainstorming, prioritization exercises, and peer discussions to identify critical barriers to their work.

2.2 Phase 2: Pilot Implementation

Based on workshop insights, we designed and implemented a five-week pilot Virtual Community of Practice (VCoP). The VCoP combined two technologies:

- Paroli: A voice-only platform enabling large-scale calls via feature phones, ensuring accessibility in regions with limited 4G connectivity
- WhatsApp: A familiar platform used for asynchronous communication, sharing resources, and providing technical support

Weekly sessions focused on themes identified during workshops, with structured facilitation to support engagement. A dual-facilitator model emerged, with one facilitator managing technical aspects while another guided discussion.

2.3 Phase 3: Evaluation

We conducted seven semi-structured interviews with pilot participants to assess the VCoP's effectiveness. Interviews explored participants' experiences with the platform, their attitudes toward peer learning, and their preferences for professional development support.

3 Findings

Our analysis revealed three key tensions that shape the design of digital peer learning services for distributed healthcare workers:

3.1 Institutional Recognition vs. Peer Knowledge

While participants valued community connections, they exhibited strong preferences for authority-driven learning. This reflected broader challenges in establishing professional legitimacy within hierarchical healthcare systems. Participants strategically sought peer support for practical needs but relied on authority figures for what they considered "legitimate" learning. This tendency was reinforced by time constraints and competing responsibilities in their healthcare roles.

3.2 Informal Learning vs. Professional Identity

The VCoP's informal structure created opportunities for experimentation, but participants struggled to reconcile this with their professional identity. Despite appreciating low-stakes learning environments, concerns about maintaining credibility often inhibited full engagement. Participants viewed seeking support as potentially conflicting with professional competence, revealing tensions between learning needs and professional standing.

3.3 Technical Accessibility vs. Engagement

The voice-only format ensured broad accessibility but created engagement challenges for more digitally proficient users. While some participants struggled with basic digital interactions, others found the low-tech approach limiting. The multi-platform approach helped bridge this gap, but highlighted the need for flexible technical solutions that can accommodate varying digital literacy levels while maintaining meaningful engagement.

4 Discussion

Our findings reveal crucial considerations for designing digital health platforms that support distributed healthcare workers in resource-constrained settings. We present three key design recommendations that address the sociotechnical complexities of implementing peer learning services in healthcare contexts:

4.1 Institutional Integration for Healthcare Delivery

Healthcare institutions play a vital role in legitimizing peer learning platforms. In settings where professional credibility significantly impacts care delivery [2, 6], institutional backing serves two critical functions: it elevates the perceived value of peer interactions within formal healthcare frameworks and fosters broader community recognition. This institutional integration is particularly crucial for community health workers who face challenges in establishing legitimacy due to cultural stigma and hierarchical healthcare structures [3]. The absence of such backing can fundamentally hinder workers' ability to deliver effective care and engage in sustained community work.

4.2 Structured Facilitation for Healthcare Learning

Our research challenges assumptions about peer learning in healthcare contexts, particularly the notion that these environments should be primarily participant-led [7]. The preference for authority-led learning reflects deeply embedded cultural practices in healthcare delivery [5]. Building on Dube et al.'s work [1], we found that effective peer learning platforms must balance hierarchical structures with collaborative learning opportunities. This structured approach provides a framework for validating peer knowledge while maintaining alignment with established healthcare learning practices.

4.3 Adaptive Technical Support

The varying levels of digital literacy among healthcare workers necessitate flexible technical solutions [8]. Our dual-facilitator model demonstrated how thoughtful platform design could bridge digital divides without compromising engagement. The integration of voice-based platforms with familiar messaging applications created multiple pathways for participation, aligning with previous research on leveraging familiar technologies [4]. This approach is particularly relevant for healthcare settings where consistent communication is crucial for care delivery. By incorporating multiple channels for engagement, the system accommodates different technological comfort levels while maintaining the cohesion necessary for effective healthcare knowledge sharing.

5 Conclusion

This work contributes to the growing discourse on interactive health technologies by examining how digital platforms can support professional development for distributed healthcare workers. Our findings highlight the importance of designing systems that work within existing healthcare structures while fostering meaningful professional development. As healthcare delivery increasingly relies on distributed workforces, particularly in resource-constrained settings, understanding how to create culturally appropriate and sustainable digital learning systems becomes crucial. The insights from this study have immediate implications for the design of interactive health technologies in several areas:

Development of digital health training platforms that balance accessibility with engagement
Integration of voice-based technologies

with existing healthcare communication systems Design of peer support mechanisms that acknowledge and work within hierarchical healthcare structures Future work should explore how these design principles can be applied to other healthcare contexts and examine long-term impacts on care delivery and professional development. As the field of interactive health evolves, ensuring that digital solutions support rather than burden healthcare workers will be crucial for improving care delivery in resource-constrained settings.

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