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Digital future Readiness of the rural mass under ABDM in India

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ABSTRACT

The study analyses the level of digital readiness among respondents in Karnataka by assessing key dimensions of digital engagement, including digital literacy, awareness of ABDM, and comfort in performing digital tasks, internet quality, and cumulative digital skills. Digital readiness is a critical determinant of effective engagement with the Ayushman Bharat Digital Mission (ABDM). Using data collected through a cross-sectional questionnaire survey, an overall measure of digital readiness was derived to capture respondents' preparedness to engage with digital health platforms. The findings indicate a moderate level of digital readiness within the study population. Importantly, individuals reporting a broader range of digital skills demonstrated higher overall readiness, highlighting the role of skill diversification in shaping digital preparedness. The results suggest that digital readiness extends beyond access and awareness alone and is meaningfully influenced by practical engagement with multiple digital skill domains. The study underscores the need for skill-oriented strategies, alongside infrastructural and awareness-based efforts, to support inclusive and effective adoption of ABDM and similar digital health initiatives.

KEYWORDS : Digital readiness, rural households, ABDM, Health ID, Digital health, Awareness, Karnataka, Rural digital adoption

1. INTRODUCTION

The rapid expansion of digital services has reshaped the Indian health system, especially with the introduction of the Ayushman Bharat Digital Mission. The mission aims to create a unified and secure digital health environment where individuals can access their health records, health ID and related services in a structured manner. For rural populations, this shift brings both opportunities and challenges. Digital readiness therefore becomes an essential factor that determines how effectively rural households can participate in this evolving system.

Digital readiness refers to a person's ability and willingness to use digital tools with clarity, confidence and a basic level of skill. It includes awareness of available services, familiarity with mobile based processes, trust in digital systems and the capability to manage information independently. In the context of ABDM, readiness also involves understanding the purpose of a health ID, recognizing the value of digital records and having the confidence to engage with a digital health platform without confusion.

Rural India has experienced rapid digital growth in recent years. Increased smartphone penetration, exposure to online payments and wider use of internet-based services have created a foundation for digital adoption. However, health related digital systems are often perceived differently from financial or communication tools. Health information involves personal details, and rural users may show caution, hesitation or doubt when dealing with sensitive data. This makes awareness, trust and guidance important components of readiness.

Karnataka's rural regions present a relevant setting for studying this readiness. Many households have access to mobile phones and basic internet services, but their understanding of ABDM varies widely. While some respondents are aware of health ID and digital records, others have only heard the term without knowing its purpose. The level of guidance from health workers, local institutions and family members also plays a role in shaping their comfort with digital health activities.

The transition to a digital health system needs more than technical infrastructure. It requires clarity, accessible information and a sense of assurance for users. If people understand why digital records matter and how they can help during hospital visits or emergencies, their willingness to adopt the system increases. If the digital process appears unfamiliar or complex, readiness declines even when devices and internet access are available.

The present study examines the digital readiness of rural households for ABDM and explores their awareness of digital health tools. It aims to understand how prepared they are to participate in this mission, what factors influence their readiness and what areas require support. By analysing their awareness, comfort and experiences, the study provides insights into how rural communities perceive digital health and what steps may strengthen their involvement.

2. SELECTED AND RELATED LITERATURE REVIEW

Digital health has received growing attention in India in recent years, especially as national initiatives work toward building a unified health ecosystem. Several researchers have highlighted the importance of digital tools in improving access and simplifying healthcare.

Agarwal and Banerjee (2021) noted that digital health systems can support smoother access to services and help people manage their records more efficiently. Their work shows that digital participation is influenced by how prepared users feel with basic tools.

Digital readiness, as described in earlier studies, refers to the combination of digital skill, awareness and willingness to engage in digital tasks. Aithal and Aithal (2020) explained that readiness develops slowly, especially in rural areas where many people depend on informal learning rather than formal training. According to their study, people in rural settings often learn digital steps by observing family members or neighbours, which helps them gain a basic level of comfort.

Digital literacy is an important part of readiness. Arora and Kaur (2018) observed that literacy helps users understand instructions, handle simple online tasks and build confidence while using digital platforms. However, they also pointed out that literacy alone does not guarantee readiness, especially when tasks involve sensitive information such as health records.

Trust has been highlighted as a core factor influencing user behaviour. Bapat (2020) found that trust develops when users feel that a system protects their information and offers clear guidance. For digital health systems, this trust is especially important because people often hesitate to share personal health details unless they feel secure. Bhattacharjee and Chatterjee (2021) also observed that rural users develop trust slowly, and their readiness improves only when they feel supported by local institutions.

Awareness plays a central role in shaping readiness. Gupta and Singh (2022) found that many rural users have some awareness of digital health initiatives, but their understanding is often shallow. They may recognise the name of a programme but not fully understand how it works or how they can benefit from it. Awareness becomes meaningful only when people understand the practical value of digital health tools.

Studies on digital health records show that digital systems help maintain continuity of care and reduce paperwork. However, Kumar and Sheel (2020) noted that rural users often feel uncertain about digital records because they worry about data loss or misuse. Their findings suggest that people need reassurance and guided support to handle digital health information confidently.

The introduction of the Digital Personal Data Protection Act has added a new dimension to the discussion on awareness and trust. Early observations by Tandon et al. (2021) show that basic awareness of data protection can increase user confidence, especially for rural users who often depend on others for support in digital tasks. However, as Government of India (2023) reports indicate, awareness of such policy measures is still growing, and many rural households are not fully familiar with the details.

Studies focused on rural India highlight that digital gaps come not only from lack of devices but from lack of guidance. Aithal and Aithal (2020) pointed out that rural users may possess smartphones but need hand holding to navigate complex systems. This becomes especially relevant for health platforms, where steps are unfamiliar and require careful attention.

Research on ABDM suggests that its success depends heavily on community level readiness. Government reports (National Health Authority, 2023) emphasise that users must understand the purpose of health ID and feel comfortable managing their digital records. However, academic work discussing readiness for ABDM is still limited. Agarwal and Banerjee (2021) mentioned the importance of involving rural communities, but detailed studies on how prepared these communities currently feel are rare.

Many researchers also highlight the emotional side of readiness. Bhattacharjee and Chatterjee (2021) found that rural people feel more confident when they know that guidance is available. Trust in health workers and local institutions plays a major role in encouraging willingness to use digital health services. When support is consistent, readiness grows; when support is missing, hesitation increases.

Overall, the reviewed literature shows that digital readiness in rural areas depends on multiple factors: literacy, awareness, trust, access, guidance and past digital experience. Although digital adoption is rising, studies specifically examining readiness for ABDM and awareness of digital health systems among rural households are still limited. This gap gives space for the present study to explore the situation more closely in the context of Karnataka.

3. RESEARCH GAP

Many studies have examined digital health adoption in India, and several have discussed the broader impact of digital services in rural areas. Some studies also describe the initial response to ABDM and the opportunities it offers. However, there is limited research that focuses specifically on how prepared rural households feel to participate in this digital health environment. The concept of digital readiness in rural areas is often mentioned, but not explored in depth. A noticeable gap exists in understanding how awareness of health ID, experience with digital tools and trust in digital systems shape readiness for ABDM. Studies that connect these elements together in the rural context of Karnataka are especially limited. This gap makes it necessary to examine digital readiness and health system awareness in a more detailed and practical manner.

OBJECTIVES OF THE STUDY

1. To assess the level of digital future readiness among rural households in Karnataka for ABDM.
2. To understand the importance of digital health and digital skills of rural people in using digital health services.
3. To identify the factors that support or limit digital readiness in rural households.

4. METHODOLOGY

Study Design and Setting

The study adopted a cross-sectional, questionnaire-based research design to assess digital readiness in the context of Ayushman Bharat Digital Mission (ABDM) adoption. The study was conducted among respondents in Karnataka, with a focus on understanding digital preparedness, awareness, and skill-related factors influencing engagement with digital health systems.

Sample and Data Collection

Primary data were collected using a structured questionnaire administered to respondents through direct and assisted modes. The questionnaire captured socio-demographic characteristics, digital access and usage patterns, awareness of ABDM, comfort in performing digital tasks, perceived internet quality, and self-reported digital skill categories. Participation was voluntary, and responses were recorded anonymously.

Measures and Variables

Digital Readiness Components

Digital readiness was assessed using four key dimensions:

1. Digital literacy, measuring respondents' perceived ability to understand and use digital technologies
2. ABDM awareness, assessing familiarity with the Ayushman Bharat Digital Mission
3. Comfort performing digital tasks, capturing confidence in carrying out routine digital activities
4. Perceived internet quality, reflecting respondents' assessment of internet accessibility and reliability

All items were measured using Likert-type scales, with higher values indicating higher levels of digital readiness.

Digital Readiness Index (DRI)
A Digital Readiness Index (DRI) was constructed by computing the mean score of the four digital readiness components: digital literacy, ABDM awareness, comfort performing digital tasks, and perceived internet quality. The index ranged from 1 to 5, with higher scores indicating greater digital readiness. The internal consistency of the index was assessed using Cronbach's alpha, which demonstrated high reliability ($\alpha = 0.86$), supporting the aggregation of the four items into a composite measure.

Digital Skills Coun
Digital skills were captured using a multiple-response format, where respondents could select more than one skill category. These included basic computer skills, advanced technical skills, understanding of specific health platforms, and internet browsing skills. Each skill item was coded dichotomously (1 = selected, 0 = not selected), and a cumulative digital skills score (Skills Count) was created by summing the selected skill categories. The resulting variable ranged from 0 to 4, representing the breadth of digital skill exposure reported by respondents.

5. ANALYSIS

This study examined digital readiness in the context of ABDM adoption by integrating multiple dimensions of digital engagement, including digital literacy, awareness of ABDM, comfort in performing digital tasks, and perceived internet quality. A composite Digital Readiness Index (DRI) was constructed based on these dimensions and demonstrated high internal consistency (Cronbach's $\alpha = 0.86$), indicating that the selected components reliably capture a unified construct of digital readiness. The observed DRI scores ranged from 1 to 5, with a mean of 2.68, suggesting a moderate level of digital readiness among respondents. This finding highlights the presence of foundational digital capacity in the study population, while also pointing to substantial scope for improvement.

A key contribution of the present study is the inclusion of a cumulative digital skills measure (Skills_Count), derived from multiple-response skill indicators. Unlike traditional single-item measures of digital competence, this approach captures the breadth of skills perceived or selected by respondents, reflecting functional exposure to different aspects of digital engagement. The regression analysis demonstrated that Skills_Count was a significant positive predictor of digital readiness ($B = 0.315$, $p < .001$), indicating that each additional digital skill selected was associated with a meaningful increase in overall digital readiness. This result underscores the importance of skill diversification rather than reliance on isolated digital abilities, particularly in the context of digital health systems.

The strength and statistical significance of this association suggest that digital readiness is not solely determined by infrastructural factors such as internet availability, but is strongly shaped by individuals' engagement with and familiarity across multiple digital skill domains. Even after accounting for baseline readiness captured through literacy, awareness, comfort, and connectivity, skill breadth independently contributed to higher readiness levels. This finding aligns with broader digital health and e-governance literature emphasizing that effective utilization of national digital health platforms requires not only access but also multidimensional digital competence.

Importantly, the descriptive distribution of DRI scores revealed neither extreme floor nor ceiling effects, indicating adequate variability within the sample. This enhances confidence in the robustness of the regression findings and suggests that the index is sensitive to differences in individual digital engagement levels. The moderate average readiness observed further implies that while respondents may possess partial familiarity with digital tools, gaps remain that could limit optimal adoption and sustained use of ABDM-related services.

From a policy and implementation perspective, the findings carry direct implications. Efforts to promote ABDM uptake should extend beyond awareness campaigns and focus on strengthening practical digital skill sets among users. Interventions that enhance exposure to multiple digital skill domains—such as guided platform navigation, hands-on digital training, and simplified user interfaces—are likely to yield greater improvements in overall digital readiness. Such approaches may be particularly relevant in regional contexts like Karnataka, where infrastructural access alone does not guarantee effective digital health participation.

6. DISCUSSION

The present study provides empirical evidence on digital readiness in the context of Ayushman Bharat Digital Mission (ABDM) adoption by examining both composite readiness indicators and specific digital skill dimensions among respondents in Karnataka. A Digital Readiness Index (DRI) was constructed using four

interrelated components which are digital literacy, ABDM awareness, comfort in performing digital tasks, and perceived internet quality. The high internal consistency of the index (Cronbach's $\alpha = 0.86$) confirms that these dimensions reliably capture a unified construct of digital readiness, supporting their aggregation into a single composite measure.

Descriptive analysis revealed a mean DRI score of 2.68 on a five-point scale, indicating a moderate level of digital readiness among respondents. While the full range of the scale was utilised, suggesting heterogeneity in digital preparedness, the overall distribution points to persistent gaps in readiness that may constrain effective engagement with ABDM-enabled services. This finding is particularly relevant in the Indian digital health context, where infrastructural expansion alone does not necessarily translate into meaningful utilisation of digital health platforms.

A central contribution of this study lies in its examination of cumulative digital skills as a predictor of digital readiness. The skills Count variable, derived from multiple-response skill indicators, captures the breadth of digital skill exposure rather than reliance on a single competency. Linear regression analysis demonstrated that Skills_Count was a statistically significant and positive predictor of DRI ($B = 0.315$, $p < .001$). This indicates that each additional digital skill selected by a respondent was associated with an average increase of approximately 0.32 points in overall digital readiness. The magnitude and significance of this association underscore the practical importance of diversified digital skill engagement in shaping readiness outcomes.

Importantly, the observed relationship suggests that digital readiness is not merely a function of access or awareness but is meaningfully influenced by the range of skills individuals perceive themselves to possess. Even in the presence of baseline literacy, awareness of ABDM, and internet connectivity, broader skill exposure independently contributes to higher readiness levels. This aligns with existing digital health and e-governance literature, which emphasises that sustained adoption of digital platforms depends on users' functional competence across multiple digital domains rather than isolated abilities.

From a policy and implementation perspective, these findings carry direct implications for ABDM rollout strategies. Interventions aimed solely at increasing awareness or improving connectivity may be insufficient if they are not accompanied by efforts to strengthen practical digital skill engagement. Training programmes, community-based digital facilitation, and simplified platform interfaces that enhance exposure to multiple digital skill domains may be particularly effective in improving overall readiness. In regional settings such as Karnataka, where variability in digital preparedness persists, targeted skill-oriented interventions could play a critical role in bridging readiness gaps and supporting inclusive digital health participation.

Limitations

This study has certain limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to draw causal inferences between digital skills and digital readiness. Second, the use of self-reported measures may be subject to response bias, particularly in the assessment of digital skills and comfort levels. Third, the study was conducted within a specific regional context (Karnataka), which may limit the generalisability of the findings to other settings. Finally, digital skill selection reflects perceived rather than objectively assessed competencies.

7. CONCLUSION

This study assessed digital readiness in the context of Ayushman Bharat Digital Mission (ABDM) adoption by examining digital literacy, awareness, and comfort with digital tasks, internet quality, and cumulative digital skills among respondents in Karnataka. The findings indicate a moderate level of overall digital readiness, as reflected by a mean Digital Readiness Index score of 2.68. The high internal consistency of the index (Cronbach's $\alpha = 0.86$) supports its validity as a composite measure of digital preparedness.

Importantly, cumulative digital skill selection emerged as a significant predictor of digital readiness, highlighting the role of diversified digital skill engagement in shaping readiness outcomes. This suggests that digital health initiatives such as ABDM may benefit from interventions that strengthen practical digital skills alongside improving awareness and access.

Overall, the study underscores the need for a multidimensional approach to digital health implementation that integrates skill development, user comfort, and infrastructural support. Future efforts aimed at enhancing digital readiness are likely to contribute to more inclusive and effective utilisation of national digital health platforms.

Policy Implications

The findings suggest that efforts to enhance ABDM adoption should move beyond awareness generation and focus on strengthening practical digital skill engagement. Targeted digital skill training, community-based facilitation, and simplified platform design may help improve overall digital readiness. Integrating skill-oriented interventions within existing public health outreach programmes could further support inclusive participation in digital health initiatives.

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