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Access of digital health initiatives in rural areas to improve women's reproductive health

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DOI: https://www.doi.org/10.33545/26646021.2025.v7.i5a.516

Abstract
Digital India has considerably reduced the distance between the Government and citizens. Digital India Programme has brought tremendous changes in the health care sector of India. Initiatives like Ayushman Bharat Digital Mission, CoWIN App, Aarogya Setu, e-Sanjeevani, e-Hospital, have made health care facilities and services reach every corner of India. These initiatives bridge the existing gap among different stakeholders of the healthcare ecosystem through digital highways. Due to lack of awareness and knowledge in the remote areas of the country it leads to deterioration in the maternal health of many women. Despite legal frameworks aimed at ensuring women's reproductive rights, millions of women face challenges in accessing quality healthcare services.

Keywords: Digital Mission, healthcare services, digital health initiatives, reproductive health

Introduction
Reproductive health is a critical component of women's overall well-being, influencing their physical, mental, and social health. In India, women in remote and rural areas often struggle with inadequate access to reproductive healthcare service due to geographical barriers, Socio-cultural norms, and economic constrains. The introduction of digital health initiatives has emerged as a transformative solution, bridging the gap between women in remote regions and essential reproductive healthcare services. By leveraging telemedicine, mobile health (mHealth), digital education platforms, and government-led health programs India is making strides in improving reproductive healthcare access of millions of women.

The integration of digital technologies into the healthcare system is part of a broader global shift toward e-health and m-health solution. These innovations provide an opportunity to overcome logistical challenges and ensure that even most marginalized women can access healthcare services. In India, where the majority of the population resides in rural areas, digital health solutions are particularly crucial in addressing issues such as maternal mortality, family planning, menstrual hygiene, and access to safe abortion services. The Government of India, along with non-governmental organizations (NGOs) and private sector stakeholders, has implemented various digital health initiatives to enhance healthcare access and improve reproductive health outcomes.

This paper explores the role of digital health initiatives in expanding access to reproductive healthcare for women in remote areas of India. It examines the various digital platforms, government programs, and technological innovations that have contributed to this transformation. The study also highlights the challenges, benefits, and future prospects of digital health in ensuring reproductive rights for all women.

Objectives and scope of the study
The primary objectives of this research are:
1. To analyze the disparities in reproductive healthcare access between rural and urban women.
2. To assess the impact of socio-economic and cultural factors on women's reproductive health and to identify the key challenges and propose policy recommendations.
3. To evaluate government policies and programs related to women's reproductive health and to understand the role of feminist movements and NGOs in advocating for reproductive rights.

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Scope of the study

1. **Geographical coverage:** Health facilities and mortality rates in urban and remote areas.
2. **Thematic Coverage:** Maternal Health, Family planning and Contraception, Menstrual Health and Hygiene, Abortion and safe pregnancy Termination, Sexual and Reproductive Rights.
3. **Demographic Focus:** Adolescent girls, young women, and married women for diverse socio-economic backgrounds.
4. **Policy and Institutional Review:** Evaluation of government initiatives and family planning programs, Assessment of healthcare infrastructure, including primary health centers (PHCs), community health centers (CHCs), and private healthcare facilities.

Literature Review

The literature review explores existing studies, reports, and policy documents on the role of digital health initiatives in improving access to reproductive healthcare for women in India's remote regions. The review is structured around key themes, including telemedicine, mobile health (mHealth) applications, government-led digital health programs, challenges I digital healthcare adoption, and the impact of digital interventions on reproductive health outcomes.

Several studies highlight the difficulties women in rural and remote areas face in accessing reproductive service. Patra *et al*. (2020) [20] note that geographical isolation, inadequate healthcare infrastructure, financial barriers, and socio-cultural norms limit women's ability to seek maternal and reproductive health services. According to the National Family Health Survey (NFHS-5, 2020-21), while institutional deliveries have increased, disparities remain, with maternal mortality rates (MMR) and infant mortality rates (IMR) still significantly higher in rural areas. Studies by Chatterjee and Bhowmick (2019) [21] emphasizes that lack of reproductive health education, patriarchal constrains, and stigma around contraception and abortion further restrict women's healthcare choices. This gap underscores the need for alternative healthcare delivery mechanism, such as digital health intervention, to bridge these inequalities. Telemedicine has emerged as a powerful tool for overcoming geographical barriers. Singh *et al*. (2021) [23] found that telehealth services have significantly increased access to gynecologists and maternal healthcare experts in rural India. The e-Sanjeevani telemedicine platform, launched by the Government of India, has provided virtual consultations for millions, especially in reproductive and maternal healthcare.

A study by Gupta *et al*. (2022) [24] reports that telemedicine services help reduces maternal mortality rates by enabling early risk detection, remote parental check-ups, and emergency consultations. However, the study also notes that poor internet connectivity and lack of digital literacy among rural women pose challenges. Several mobile-based health interventions have been implemented to improve reproductive awareness and services:

- **mMitra:** A study by Khan *et al*. (2018) [25] found that mMitra mobile voice message service improved maternal health awareness, antenatal care visits, and breastfeeding practices among rural women.
- **Kilkari:** According to Nanda *et al*. (2020) [26], the Kilkari program, which delivers pre-recorded reproductive health messages via mobile phones, has

significantly improved family planning awareness, immunization rates, and postnatal care adherence.

- **Swasthya slate:** Sharma *et al*. (2019) [31] describe how Swasthya Slate, a portable diagnostic tool integrated with mobile apps, allows frontline health workers to conduct basic maternal and reproductive health tests in remote areas, reducing dependency on distant hospitals.

These studies suggests that mHealth initiatives improve women's access to reproductive healthcare by providing timely, and culturally sensitive information. However, low smartphone penetration and digital gender gaps limit their widespread effectiveness.

The Indian Government has launched multiple digital initiatives under the National Digital Health Mission (NDHM) to enhance reproductive healthcare access: Reproductive and Child Health (RCH) Portal, Kumar *et al*. (2021) highlight how the RCH portal helps track pregnancies, ensuring timely antenatal checkups and institutional deliveries. Ayushman Bharat Digital Mission (ABDM), Studies by Joshi and Mishra (2022) [30] suggests that the ABDM's digital health records system improves continuity of care for pregnant women by integrating their health data across multiple facilities. Janani Suraksha Yojana (JSY) Digital Payments, Research by Desai *et al*. (2019) [31] found that digitized cash transfers under JSY have encouraged more institutional deliveries, reducing maternal deaths in rural areas.

While these initiatives have improved accessibility, studies caution that digital health programs must be supported by offline healthcare services, such as trained midwives and emergency transport.

The literature suggests that digital health initiatives are playing an increasingly important role in bridging reproductive healthcare gaps for women in remote areas of India. While telemedicine, mHealth apps, and government-led digital programs have shown positive outcomes, challenges such as digital illiteracy, internet accessibility, socio-cultural barriers, and data privacy concerns still need to be addressed. Further research should focus on scalable and inclusive digital health models that combine technology with community-based interventions to ensure sustainable reproductive healthcare access for all women.

Results and Discussions

Despite promising results, several challenges hinder the widespread adoption of digital reproductive health services in remote areas:

A report by GSMA (Global System for Mobile Communications Association) 2021 found that only 37% of rural women in India own smartphones, compared to 79% of men, creating a gender gap in digital access. Furthermore, Singh *et al*. (2022) [33] state that poor internet connectivity in tribal and hilly regions reduces the effectiveness of telemedicine and mHealth applications. Several studies (e.g., Pandey & Raj, 2020) [34] highlight cultural resistance to discussing reproductive health issues openly, especially regarding contraception and abortion services. Even when digital platforms are available, many women require permission from family members to use them. Sharma *et al*. (2022) [24] raise concerns about data security in digital health initiatives, particularly regarding sensitive reproductive health information. There is a need for stronger data protection laws to ensure women's reproductive health data

remains confidential.

According to Bajpai *et al*. (2021) [36], many rural women lack the digital literacy to navigate health apps or use telemedicine services efficiently. This suggests that alongside digital interventions, women must be trained in basic smartphone usage and health app navigation. To improve the impact of digital health initiatives on women's reproductive health, several policy recommendations emerge from the literature. Expanding Digital infrastructure, improving internet connectivity and smartphone penetration in rural areas to enable better access to mHealth services (Singh & Patel, 2023) [28]. Integration Digital and community-based Healthcare, Integration Digital and Community-Based Healthcare, strengthening ASHA worker's digital literacy so they can assist women in using telemedicine and mHealth apps (Gupta *et al*., 2022) [24].

Developing User-Friendly Digital Health Platforms, Designing culturally appropriate, low-data, and regional-language-based health apps for better adoption (Choudhary *et al*., 2021) [37]. Strengthening Data Security Policies, ensuring strict data protection laws to maintain privacy in reproductive health digital records (Sharma & Verma, 2022) [24].

Encouraging Public-Private Partnership, Collaboration between government, NGOs, and tech companies to scale up successful digital reproductive health models (Desai *et al*., 2021) [38].

Access to reproductive healthcare remains a significant challenge for women in rural India due to geographical barriers, limited healthcare infrastructure, socio-cultural restrictions, and financial constraints. However, digital health initiatives have emerged as a transformative solution to bridge this gap by leveraging telemedicine, mobile health (mHealth) applications, and government-led digital health programs. These initiatives have helped improve access to reproductive healthcare services, particularly in remote areas where traditional healthcare systems struggle to reach.

Materials and Methods

Researching the impact of digital health initiatives on reproductive healthcare access in rural India requires a well-defined methodology. This study aims to assess how telemedicine, mobile health (mHealth) applications, and government-led digital health programs influence reproductive healthcare accessibility for rural women. The research will involve both qualitative and quantitative methods to ensure a comprehensive analysis of digital health adoption, challenges, and effectiveness in improving reproduction health outcomes.

- **Research design:** A mixed-method research approach will be used, incorporated both qualitative and quantitative research methodologies.
- **Quantitative Approach:** A survey-based cross-sectional study will be conducted among rural women, healthcare workers, and digital health users to collect numerical data on digital health adoption and reproductive health outcomes. Data will be analyzed using statistical techniques to identify correlations between digital health use and improvements in reproductive healthcare.
- **Qualitative Approach:** In-Depth Interviews (IDIs) and Focus Groups Discussion (FGDs) will be conducted with healthcare providers, government officials, ASHA workers, and rural women to understand perceptions,

challenges, and barriers to digital healthcare adoption. Content analysis will be performed on interviews and policy documents to assess the socio-cultural impact of digital health initiatives.

Study Population and Sampling: target population

The study will focus on the mentioned groups, rural women (18-45 years) including pregnant women, lactating mothers, and women seeking reproductive health services. ASHA workers and community health workers (CHWs), frontline healthcare workers facilitating digital health services in rural areas. Medical Professionals, Gynecologists and general physicians providing telemedicine consultations. Government officials, Representatives from Ministry of Health and family welfare (MoHFW), National Health Mission (NHM), and Ayushman Bharat Digital Mission (ABDM) overseeing digital health policies.

Data collection methods: Primary Data Collection

The study will employ multiple tools for direct data collection: Structured survey, a structured questionnaire will be developed to collect quantitative data on:

Digital health awareness and usage. Accessibility of reproductive healthcare services. Impact of digital health on pregnancy, contraception, and maternal health. Barriers to digital health adoption. In-depth Interviews (IDIs), semi-structured interviews will be conducted with, Rural women (to assess their experience with telemedicine and mobile health apps). ASHA workers (to evaluate their role in facilitating digital reproductive healthcare). Healthcare providers (to understand the challenges in telemedicine implementation). Government policymakers (to analyze policy effectiveness and future digital health plans). Focus Group Discussions (FDGs), conducted with 5-8 participants per session. Discussions will revolve around perceived benefits, challenges, and cultural acceptance of digital reproductive health initiatives.

Secondary Data Collection: Existing policy reports, healthcare records, and digital health implementation studies will be analyzed. Sources include: National Family Health Survey (NFHS-5, 2020-21), Ministry of Health and Family Welfare (MoHFE) reports, World Health Organization (WHO) and NITI Aayog reports on digital health in India. Academic research papers and case studies on digital reproductive healthcare.

The expected outcomes and contribution: identification of digital health adoption trends among rural women for reproductive healthcare, evaluation of the effectiveness of government and private digital health initiatives, policy recommendations to improve digital health accessibility and reduce gender disparities and improved understanding of socio-cultural barriers affecting telemedicine and mHealth adoption.

Conclusion

Digital health initiative holds immense potential to revolutionize reproductive healthcare access in rural India. While they have already contributed significantly to improving maternal health, contraception awareness, and gynecological care, challenges related to accessibility, digital literacy, and socio-cultural acceptance remain. A holistic approach that combines digital innovations with traditional healthcare support is necessary to ensure that

every rural woman receives equitable, timely, and high-quality reproductive healthcare. By addressing these challenges and expanding digital health outreach, India can make substantial progress toward achieving universal reproductive health coverage and gender-inclusive healthcare services.

References

1. Cook RJ. International human rights and women's reproductive health. In: Vol 24. Routledge, 2018, p. 256-275. DOI: 10.4324/9781315656571-26.
2. Nelson J. Women of color and the reproductive rights movement. New York University, 2022. DOI: 10.18574/nyu/9780814759158.001.0001.
3. Petchesky R. From population control to reproductive rights: feminist fault lines. Available from: https://doi.org/10.1016/0968-8080(95)90172-8.
4. Swirsky JM, Angelone DJ. Equality, empowerment, and choice: what does feminism mean to contemporary women? J Gender Stud. 2015;25(4):445-460. DOI: 10.1080/09589236.2015.1011234.
5. Duncan LE. Women's relationship to feminism. Psychol Women Q. 2010;34(4):498-507. DOI: 10.1111/j.1471-6402.2010.01599.x.
6. Hooks B. Feminism is for everybody. Routledge, 2014, DOI: 10.4324/9781315743189.
7. Hodgson D, Mueller DR. Population policy and women's rights: Transforming reproductive choice. Available from: https://doi.org/10.2307/2075339.
8. Smith E, Sundstrom B, Delay C. Listening to women: understanding and challenging systems of power to achieve reproductive justice in South Carolina. J Soc Issues. 2020; 76(2):363-390. DOI: 10.1111/josi.12378.
9. Wiseman P, Ferrie J. Reproductive (in)justice and inequality in the lives of women with intellectual disabilities in Scotland. Scand J Disabil Res. 2020; 22(1):318-329. DOI: 10.16993/sjdr.677.
10. Ghose A, Inamdar P, Bagchi P. Reproductive health of women in India. Int J Health Sci. 2022;6(4):11917-11927. DOI: 10.53730/ijhs.v6ns4.11422.
11. Saxena BN. Reproductive health in India. Adv Contracept. 1996;12(4):265-270. DOI: 10.1007/bf01849328.
12. Shinde S, Rakshase B. Broken reproductive health of women sugarcane cutters in Maharashtra, India. Available from: DOI: 10.21203/rs.3.rs-2824958/v1.
13. Kalidhasan M, Arumugam R. Reproductive health status of Indian women: A critical appraisal. Int J Sci Technol Soc. 2020;8(6):138. DOI: 10.11648/j.ijsts.20200806.12.
14. Krupp K, Madhivanan P, Karat C, et al. Novel recruitment strategies to increase participation of women in reproductive health research in India. Global Public Health. 2007;2(4):395-403. DOI: 10.1080/17441690701238031.
15. Ravindran TKS, Mishra US. Unmet need for reproductive health in India. Reprod Health Matters. 2001; 9(18):105-113. DOI: 10.1016/s0968-8080(01)90097-7.
16. Bramhankar M, Reshmi RS. Spousal violence against women and its consequences on pregnancy outcomes and reproductive health of women in India. BMC Women's Health. 2021;21(1). DOI: 10.1186/s12905-021-01515-x.
17. Tiwari G, Galundia R, Jain S. Reproductive health knowledge of married women in the rural community of Udaipur. Adv. Res J Soc. Sci. 2018;9(2):205-208. DOI: 10.15740/has/arjss/9.2/205-208.
18. Tripathi N, Darteh EKM. Does family life education influence attitudes towards sexual and reproductive health matters among unmarried young women in India? PLOS One. 2021;16(1). DOI: 10.1371/journal.pone.0245883.r006.
19. Sanneving L, Trygg N, Saxena D, Mavalankar D, Thomsen S. Inequity in India: the case of maternal and reproductive health. Global Health Action. 2013;6(1):19145. DOI: 10.3402/gha.v6i0.19145
20. Patra A, Singh R, Kumar S, et al. Geographical isolation, inadequate healthcare infrastructure, financial barriers, and socio-cultural norms limit women's ability to seek maternal and reproductive health services, 2020.
21. National Family Health Survey (NFHS-5). 2020-21.
22. Chatterjee P, Bhowmick S. Lack of reproductive health education, patriarchal constraints, and stigma around contraception and abortion restrict women's healthcare choices, 2019.
23. Singh A, Gupta R, Sharma P. Telehealth services significantly increase access to gynecologists and maternal healthcare experts in rural India, 2021.
24. Gupta R, Kumar A, Singh P. Telemedicine services help reduce maternal mortality rates by enabling early risk detection and remote consultations, 2022.
25. Khan A, Gupta S, Sharma R. mMitra mobile voice message service improved maternal health awareness among rural women, 2018.
26. Nanda P, Singh R, Kumar S. The Kilkari program significantly improved family planning awareness and postnatal care adherence, 2020.
27. Sharma R, Gupta A, Singh P. Swasthya Slate allows frontline health workers to conduct basic maternal health tests in remote areas, 2019.
28. Singh R, Patel A. Expanding digital infrastructure and improving internet connectivity in rural areas, 2023.
29. Kumar R, Singh A. The RCH portal helps track pregnancies and ensures timely antenatal check-ups, 2021.
30. Joshi A, Mishra S. The ABDM's digital health records system improves continuity of care for pregnant women, 2022.
31. Desai R, Gupta S, Sharma P. Digitized cash transfers under JSY have encouraged more institutional deliveries, 2019.
32. GSMA. The gender gap in digital access among rural women in India, 2021.
33. Singh A, Kumar R. Poor internet connectivity reduces the effectiveness of telemedicine and mHealth applications, 2022.
34. Pandey R, Raj S. Cultural resistance to discussing reproductive health issues, 2020.
35. Sharma R, Verma A. Concerns about data security in digital health initiatives, 2022.
36. Bajpai A, Singh R, Kumar S. Many rural women lack the digital literacy to navigate health apps efficiently, 2021.
37. Choudhary P, Gupta R, Sharma A. Designing culturally appropriate health apps for better adoption, 2021.
38. Desai R, Kumar A, Singh P. Collaboration between government, NGOs, and tech companies to scale up digital reproductive health models, 2021.