

GENDERED DIGITAL FUTURES: TECHNOLOGY AS A CATALYST FOR WOMEN'S EMPOWERMENT, REPRODUCTIVE HEALTHCARE POLICY AND SOCIAL TRANSFORMATION

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Abstract: Digital technologies are increasingly recognized as transformative instruments for advancing gender equality, yet their benefits remain unevenly distributed across social, economic, and geographic lines. This paper investigates how technology functions as a catalyst for women's empowerment, reproductive healthcare policy transformation, and broader social change in contemporary India. Employing a qualitative, multi-method research design grounded in feminist and intersectional frameworks, the study draws on systematic analysis of peer-reviewed literature (2013–2025), government policy documents, and evaluations of flagship digital health programmes including the Pradhan Mantri Matru Vandana Yojana (PMMVY), Kilkari, and eSanjeevani. Findings reveal that digital platforms telemedicine, mobile health applications, and AI-driven diagnostics have significantly improved access to maternal and reproductive health services, particularly in rural and marginalized communities. Digital education and financial inclusion initiatives are likewise expanding women's agency and socio-economic participation. However, persistent barriers including the digital gender divide, socio-cultural restrictions, inadequate digital literacy, and risks such as cyber violence and algorithmic bias continue to limit equitable access. The study further identifies critical governance gaps including insufficient gender-sensitivity in AI policy, weak data protection enforcement, and exclusionary digital design through systematic policy analysis. These findings underscore the need for rights-based, intersectional, and gender-responsive digital governance frameworks to ensure that technological progress contributes meaningfully to gender justice and sustainable development.

Keywords: digital empowerment, women's health policy, reproductive healthcare, gender and technology, digital inclusion

INTRODUCTION

Digital technologies have fundamentally altered the conditions under which women in India negotiate agency, access services, and participate in public life. The Government of India's Digital India programme (2015–2025), alongside sector-specific reforms in Aadhaar-based service delivery,

telemedicine, digital financial inclusion, and integrated reproductive health portals, has positioned technology at the centre of social development policy (Kar & Ram, 2024). These shifts have created new opportunities for women in education, healthcare, economic participation, and civic engagement. Yet persistent structural inequalities rooted in caste, class, rurality, and patriarchal norms mean that the benefits of digitalisation remain unevenly distributed: only 33% of Indian women have ever used the internet compared to 55% of men and women (GSMA, 2023) remain significantly underrepresented in both the technology and finance sectors (Duvendack et al., 2023; Sinha & Nayak, 2024). The promise of digital inclusion has not been evenly or automatically realised.

Reproductive healthcare represents a particularly critical domain in which this tension between digital potential and structural exclusion plays out. India's maternal health indicators have improved incrementally, yet deep inequalities in antenatal care access, safe childbirth, and family planning persist, especially among rural and marginalised women. Digital platforms including telemedicine services such as eSanjeevani, mHealth applications such as Kilkari and mMitra, and the Aadhaar-linked PMMVY portal are increasingly deployed to close these gaps (Ashokan Naidu, A. 2024). However, the same digital systems that improve access for some women can exclude others through Aadhaar authentication failures, documentation requirements, and inadequate digital literacy. Beyond healthcare, digital tools are reshaping women's access to education, livelihoods, and civic participation yet risks including cyber violence, algorithmic bias, and reproductive surveillance through 'femtech' platforms complicate any straightforward account of digital empowerment (Mishra & Suresh, 2021). Robust governance frameworks, gender-sensitive policy, and ethical AI design are therefore essential if technology is to function as a genuine catalyst for equity rather than a replication of existing inequalities.

Against this backdrop, this paper investigates how digital technology functions as a catalyst for women's empowerment, reproductive healthcare policy transformation, and broader social change in India. Drawing on a qualitative, multi-method design grounded in feminist and intersectional frameworks, it examines the intersections of digital inclusion, gender justice, and public policy with particular attention to the experiences of marginalised women and the structural conditions that shape their digital lives. The paper argues that equitable digital futures require not only connectivity, but rights-based, participatory, and intersectional approaches that place women at the centre of both technological design and governance.

LITERATURE REVIEW

2.1 Gender, Technology, and Digital Inclusion

Scholarly work over the past two decades has consistently highlighted the transformative potential of digital technologies in advancing gender equality. Foundational contributions by Castells (2001) and

Wajcman (2004) established that the digital revolution reconfigures social relations and creates new spaces for women's participation in public life. Subsequent research has confirmed that access to digital tools expands women's autonomy, communication, and mobility, though scholars caution that these gains are neither automatic nor evenly distributed.

Despite this potential, digital access remains deeply gendered. The GSMA Mobile Gender Gap Reports (2019–2024) consistently show that women in South Asia are significantly less likely than men to own smartphones, access the internet, or use mobile financial services. Indian studies corroborate these patterns, highlighting structural barriers including affordability, socio-cultural restrictions, safety concerns, and limited digital literacy as primary constraints (Imam & Ajay Sharma, 2024); NITI Aayog, 2022). Wealth compounds these disparities found that only one-third of Indian women use the internet compared to men, with the gap most pronounced in the lowest wealth quintiles. Gupta et al. (2025) similarly document significant socio-cultural and infrastructural barriers to digital health literacy among women, while (Nayak & Alam, 2022) note that women's underrepresentation in both the technology and finance sectors deepens constraints on accessing digital financial services. Although initiatives such as Digital India and the National Digital Literacy Mission have begun narrowing these gaps, progress remains uneven and insufficient.

Intersectionality and the Digital Divide

Crenshaw's (1989) framework of intersectionality remains central to understanding how women's digital experiences are shaped by overlapping social inequalities. Across the literature, caste, class, religion, age, and the rural–urban divide are consistently identified as axes through which digital access and outcomes are differentiated. Dalit women, Adivasi women, migrant women, and women with disabilities face compounding layers of exclusion that undermine digital agency and participation (Islam & Manchanda, 2022). Patriarchal norms further restrict women's mobile phone use in rural contexts, with studies from central India documenting how dependence on male family members mediates women's digital engagement (Scott et al., 2021). The COVID-19 pandemic exacerbated these inequalities, particularly among tribal communities in states such as Jharkhand (Nayak & Alam, 2022). Government-led access initiatives such as Internet Saathi have struggled to translate connectivity into meaningful use, pointing to a persistent gap between access and agency that policy must urgently address (Dhanamalar et al., 2020).

2.2 Technology and Women's Empowerment

Women's empowerment is widely conceptualised in terms of agency, choice, resource access, and decision-making capacity (Kabeer, 1999; Sen, 1999). The literature identifies digital technologies as

meaningful enablers of each of these dimensions, though the extent of empowerment varies considerably by social position and context.

Digital Skills and Education

In the domain of education, digital literacy has emerged as a foundational capability that opens pathways to employment and entrepreneurship for women. E-learning platforms, MOOCs, and skill-based mobile applications enable flexible, self-paced learning that accommodates women's household responsibilities, while digital education programmes are increasingly promoting STEM participation among girls and challenging entrenched gender stereotypes. Mukherjee et al. (2024) provide direct evidence from India showing that digital literacy training significantly enhances unemployed women's perceived ICT competence and increases their pursuit of education and employment opportunities. Access to digital and financial literacy, scholars argue, is a prerequisite for women's meaningful participation in the modern economy (Kulkarni, & Ghosh, 2021).

Economic Empowerment through Technology

Digital technologies have also expanded economic opportunities for women, particularly through online marketplaces, digital banking, and micro-entrepreneurship platforms that enable income generation without requiring physical mobility. SHG-based e-commerce initiatives have created visible pathways for rural women's economic participation, and Verma (2024) documents how digital entrepreneurship is enabling women to overcome longstanding barriers including limited market access and scarce financial resources. Verma (2024) similarly highlight digital media's role in amplifying women's start-up ventures. However, scholars caution that without supportive structural policies, digital work risks reinforcing existing gendered labour burdens and informalising women's economic contributions rather than transforming them.

2.3 Digital Technologies in Reproductive Healthcare

The integration of digital technologies into maternal and reproductive health services has attracted growing scholarly attention, with telemedicine, mHealth applications, AI-supported diagnostics, and digital monitoring systems increasingly recognised as tools with the potential to close longstanding gaps in service access and quality, particularly in underserved communities.

Telemedicine and mHealth

Telemedicine has emerged as a particularly significant tool for bridging healthcare disparities in rural India, enabling remote consultations, antenatal monitoring, and emergency referrals that were previously inaccessible in remote and low-income settings (Ashokan Naidu, A. (2024).). Mobile health

(mHealth) interventions including Kilkari, mMitra, and the Healthy Mother App have demonstrated effectiveness in improving breastfeeding practices, enabling early detection of high-risk pregnancies, and supporting adherence to antenatal and postnatal check-ups. Laar et al. (2024) confirm that mHealth platforms are effective in delivering sexual and reproductive health information to young people in rural low- and middle-income settings, while Parthasarathi et al. (2024) document telehealth's growing focus on maternal and child health through patient education, monitoring, and diagnostics in Indian primary care contexts.

Digital Monitoring and Policy Delivery

Digital governance tools have also transformed reproductive health policy implementation. The Reproductive and Child Health (RCH) Portal, eSanjeevani, and the Health Management Information System (HMIS) have enhanced accountability, reduced duplication, and improved real-time monitoring of programme delivery. The PMMVY provides a particularly instructive case: studies by (Nandan et al., 2025) show that the scheme's Aadhaar-linked portal has improved benefit transfer transparency and reduced fraud. However, Aadhaar authentication failures, documentation barriers, and digital illiteracy continue to exclude the most marginalised women from accessing entitlements, demonstrating that digital governance reforms can inadvertently recreate the exclusions they aim to address.

AI and Data-Driven Healthcare

Emerging research explores AI-enabled tools for maternal health risk prediction, fetal monitoring, and tele-radiology as means of improving reproductive outcomes. However, feminist scholarship urges critical scrutiny of these developments. Radhakrishnan (2021) argues that AI systems in healthcare are not neutral but embed gendered knowledge and can selectively restrict access to care for underserved communities. Tamrat et al. (2024) identify both significant opportunities and heightened risks to bodily autonomy arising from AI applications in sexual and reproductive health, while John et al. (2024) demonstrate that algorithmic bias compounds existing gender and socioeconomic inequities in health systems. Concerns about data justice are particularly salient in the Indian context, where Varon and Peña (2021) caution that datafication through systems such as Aadhaar can undermine rights and disproportionately harm the poor. Taken together, this body of scholarship underscores the need for feminist governance of AI, including representative datasets, gender audits, and robust data privacy protections.

2.4 Cybersecurity, Digital Risks, and Gendered Vulnerabilities

While digital platforms create new opportunities for women, they also expose them to heightened risks. Cyberstalking, online harassment, deepfakes, and non-consensual image sharing are

well-documented deterrents to women's digital participation, as documented by the Internet Freedom Foundation and UN Women. In India, NCRB data (2022–2024) reveal a steady rise in cybercrimes targeting women, including impersonation and financial fraud. Lal et al. (2024) characterise cyber harassment as pervasive and structurally rooted in gender-based power imbalances, amplified by anonymity and regulatory gaps. The consequences are severe: Halder and Jaishankar (2011) document significant harms to women's mental health, professional lives, and well-being, while Nigam (2024) critiques the inadequacy of India's legal framework in providing accessible redress for victims. Scholars consistently call for stronger legal protections, gender-sensitive cyber policies, and digital safety literacy as essential components of any inclusive digital strategy (Vidani, 2024).

2.5 Governance, Ethics, and Policy Frameworks

The governance dimensions of digital transformation have attracted increasing attention from both international bodies and domestic policymakers. Internationally, frameworks such as the Sustainable Development Goals, the Beijing+25 Review, and the UN Global Digital Compact (2024) emphasise women-centred digital transformation as a precondition for equitable development. In India, the National Digital Health Mission, National Education Policy 2020, and Digital Personal Data Protection Act 2023 collectively frame digital governance through rights-based and privacy-oriented approaches. Scholars emphasise, however, that policy intent must be matched by feminist implementation: John et al. (2024) identify fairness, data minimization, transparency, consent, and inclusivity as non-negotiable ethical principles in the design of gender-aware digital systems. A recurring finding across the literature is that without deliberate gender-sensitive design and the active inclusion of women in policymaking, digital governance risks reproducing rather than dismantling patriarchal and casteist structures.

2.6 Gaps in Existing Literature

Despite the breadth of existing scholarship, several significant gaps remain. First, intersectional barriers in digital health and digital education for multiply-marginalised women — those who are simultaneously poor, rural, Dalit, disabled, or migrant — receive insufficient empirical attention, with most studies addressing single axes of exclusion. Second, direct empirical linkages between digital empowerment interventions and reproductive health policy outcomes remain underexplored, limiting the evidence base for policy design. Third, AI bias and algorithmic discrimination within reproductive health systems constitute an emerging concern that the literature has only begun to investigate. Fourth, the long-term sustainability of digital empowerment initiatives for rural and low-income women has rarely been studied beyond short-term programme evaluations. Finally, the persistent absence of gender-disaggregated data across digital access, health outcomes, and policy utilisation severely constrains the ability to monitor progress and design targeted interventions. These gaps collectively identify the space

that this paper addresses — namely, a comprehensive and interdisciplinary analysis that connects technology, gendered experience, and policy in a sustained and critically informed framework.

METHODOLOGY

This study employs a qualitative, multi-method research design situated within a feminist epistemological framework. Feminist methodology was chosen deliberately because it foregrounds women's lived experiences, challenges androcentric hierarchies in knowledge production, and centres the perspectives of marginalized groups in shaping both inquiry and interpretation (Harding, S. (Ed), 1987; Ramazanoglu & Holland, 2002). Given that the study interrogates the intersections of digital ecosystems, reproductive health policy, and gendered socio-cultural norms across diverse communities in India, a single-method approach would have been insufficient to capture the complexity and contextual nuance required. The multi-method design therefore combines three complementary analytical strands: systematic literature analysis, policy and programme analysis, and thematic interpretation using feminist and intersectional frameworks. Together, these three strands constitute the triangulation strategy employed in this study, wherein convergence of evidence across sources strengthens the credibility and depth of findings (Denzin, 1978). Each strand is operationalised as described in the following sub-sections.

a) Systematic Literature Analysis

The first analytical strand involved a systematic review of secondary literature spanning peer-reviewed journal articles published between 2013 and 2025, sourced from databases including Scopus, PubMed, Google Scholar, and JSTOR. Search terms combined keywords such as "digital technology and women's empowerment," "reproductive health policy India," "telemedicine gender," "digital divide women India," and "mHealth maternal health." Inclusion criteria required that sources address gender, digital technology, or reproductive health in the Indian context or comparable low- and middle-income settings; were published in English; and appeared in peer-reviewed journals or credible institutional reports. In addition to academic literature, the review incorporated government policy documents from the Ministry of Women and Child Development (MWCD), Ministry of Health and Family Welfare (MoHFW), and NITI Aayog, alongside reports from international bodies including UN Women, the World Health Organization (WHO), the International Telecommunication Union (ITU), and GSMA. Programme evaluations and review reports for flagship schemes including PMMVY, Poshan Abhiyaan, and Mission Shakti were also analysed. This strand directly addresses Research Questions 1, 3, and 4, providing the evidential base for understanding how digital technologies shape women's empowerment and what barriers persist.

b) Policy and Programme Analysis

The second analytical strand involved a structured policy and programme analysis, employing a feminist qualitative framework to critically examine the gender-responsiveness and digital integration of key maternal and reproductive health initiatives. The programmes selected for analysis—PMMVY, Kilkari, mMitra, Janani Suraksha Yojana (JSY), the Reproductive and Child Health (RCH) portal, Poshan Tracker, the National Digital Health Mission (NDHM), and the Digital Personal Data Protection Act (2023) were chosen because they represent the primary digital governance mechanisms through which reproductive health services are currently delivered or regulated in India. For each programme, analysis was structured around four evaluative criteria: (i) programme strengths in terms of digital reach and inclusion; (ii) operational constraints and implementation gaps; (iii) gender equity considerations, including differential access and impact for marginalized women; and (iv) persistent policy gaps not yet addressed by current frameworks. This strand directly addresses Research Questions 2 and 5, enabling a critical assessment of how digital platforms are transforming reproductive healthcare delivery and what policy innovations are needed.

c) Thematic Interpretation using Feminist and Intersectional Frameworks

The third analytical strand applied thematic analysis, following Braun and Clarke's (2006) six-phase framework, to identify, code, and interpret patterns across the literature and policy data. Coding proceeded inductively, with themes emerging from recurring issues identified across sources, and deductively, guided by the study's research questions and theoretical frameworks. An intersectional lens (Crenshaw, 1989) was applied throughout to interpret how overlapping social categories including caste, class, rurality, disability, migration status, and marital status shape women's differential digital experiences and outcomes. Five major themes were identified through this process: digital technology as a catalyst for empowerment; digital innovation in reproductive and maternal healthcare; persistent barriers to digital inclusion; risks and ethical challenges; and policy gaps and transformation opportunities. These themes structure the Findings section and are directly mapped to the research questions.

Research Questions

The study is guided by five interrelated research questions. The first asks how digital technologies shape women's empowerment in contemporary India. The second examines what roles digital platforms play in transforming reproductive healthcare delivery and influencing policy. The third explores how marginalized women experience digital inclusion or exclusion. The fourth investigates what structural, socio-cultural, and technological barriers inhibit equitable digital access for women. The fifth considers what policy innovations are needed to foster gender-equitable digital futures. These questions informed

both the selection of source materials and the thematic analysis, ensuring that findings remain anchored to the study's central aims.

Scope and Delimitations

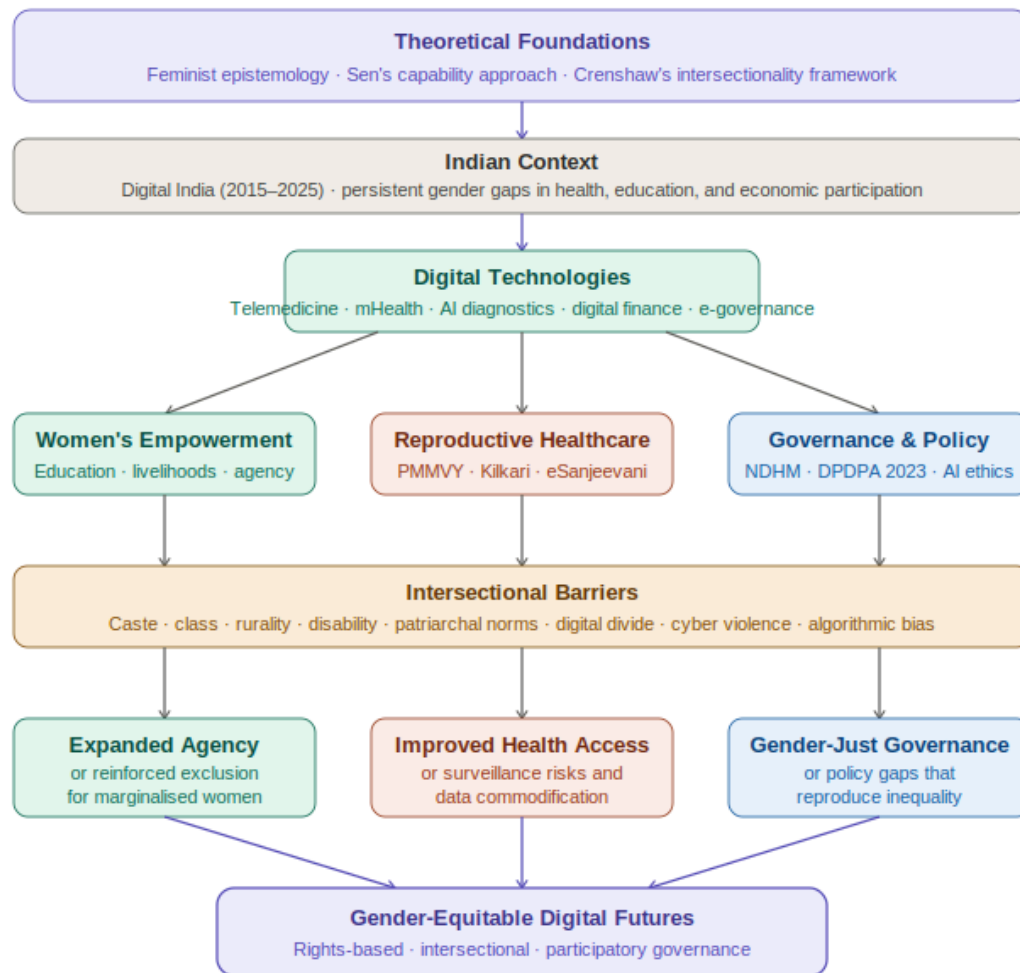
The study is geographically delimited to India and thematically bounded by four intersecting domains: gender and digital access; digital tools in reproductive and maternal health; policy and programmatic structures; and pathways to social transformation. The temporal scope of the literature review spans 2013 to 2025, capturing the decade of Digital India implementation and subsequent policy developments. Consistent with its qualitative design, the study does not seek to quantify health outcomes or establish causal relationships. Primary data collection involving direct fieldwork or human participants was outside the scope of this study, which is grounded entirely in secondary analysis.

Ethical Considerations

Feminist ethics informed every stage of this research process. As a desk-based study relying on secondary sources, ethical responsibilities centred primarily on the fair and accountable representation of women's voices and experiences as documented in existing literature. Confidentiality was respected across all reviewed materials; where individual women's narratives appeared in cited studies, these were engaged with analytically rather than re-exposed in ways that could compromise dignity or privacy. Given the sensitive nature of reproductive health in the Indian context, the analysis maintained critical reflexivity and avoided reductive or essentialist representations. Throughout, the authors practised accountability in interpretation, acknowledging positionality and the limitations of desk-based inquiry.

Conceptual Framework

Figure 1 presents the conceptual framework guiding this study. It illustrates how feminist theoretical foundations and the Indian policy context interact with digital technologies to produce outcomes across three domains: women's empowerment, reproductive healthcare, and governance and policy. Intersectional barriers including caste, class, rurality, disability, and cyber violence mediate these relationships, producing either expanded agency or reinforced exclusion depending on the design and implementation of digital systems. The framework converges on the goal of gender-equitable digital futures, achievable only through rights-based, intersectional, and participatory governance.

Figure 1*Conceptual Framework — Gendered Digital Futures***FINDINGS**

Findings from systematic literature review, policy analysis, and thematic inquiry reveal a multifaceted landscape of gender and digital transformation in India. These are organised under five major themes, each directly mapped to the study's research questions.

4.1 Digital Technology as a Catalyst for Women's Empowerment**4.1.1 Enhanced Access to Information and Services**

Digital platforms and government portals especially under Digital India have unlocked new opportunities for women to access timely, reliable information on legal rights, financial inclusion, jobs,

health services, and welfare schemes. Transparency in programme delivery (PMMVY, MGNREGA, scholarships, pension schemes) has improved, with digitised benefit transfers fostering greater autonomy for women. Aadhaar-linked payments and real-time dashboards have facilitated the transfer of ₹19,000 crore to over four crore women, underscoring the potential of digital governance to enhance female agency.

4.1.2 Digital Livelihood Opportunities

Growing digital literacy among women, particularly through targeted programmes (PMGDISHA, Digital Saksharta Abhiyan), has enabled active participation in online entrepreneurship, e-commerce, gig work, and self-help group (SHG) platforms such as e-Sakhi and DAY-NRLM. Women's SHGs using digital payments report higher autonomy and financial bargaining power. Despite these advances, women comprise only one-fifth of India's formal digital workforce and remain underrepresented in leadership roles.

4.1.3 Strengthening Agency and Decision-Making

Access to smartphones and online platforms is shifting gender norms within households, with digital-savvy women and adolescent girls increasingly influencing health, education, and mobility decisions. These changes are most visible among first-generation digital users, promoting wider social and economic assertiveness.

4.2 Digital Innovation in Reproductive and Maternal Healthcare

4.2.1 Improved Access through Telemedicine

Telemedicine services such as eSanjeevani have revolutionised healthcare delivery, facilitating remote consultations, antenatal care, mental health support, and emergency referrals especially benefiting rural and isolated women. The expansion of tele-obstetrics post-COVID-19 has made specialised health advice more accessible.

4.2.2 Mobile Health (mHealth) Interventions

Mobile applications including Kilkari, mMitra, ASHA Soft, and eSanjeevani bolster birth preparedness, immunisation, nutritional counselling, and postnatal follow-ups. Kilkari alone has reached over 10 million women, demonstrating the scalable impact of digital outreach on maternal health.

4.2.3 AI and Digital Risk Prediction

AI-driven health systems increasingly support early identification of risky pregnancies, anaemia, malnutrition, and chronic complications, contributing to reductions in maternal mortality. However, data quality, algorithmic bias, and rural underrepresentation pose persistent challenges.

4.2.4 Digitalisation of Welfare Schemes

Schemes such as PMMVY, Poshan Tracker, and NDHM use dashboards, Aadhaar-based verification, and real-time tracking for greater efficiency and reduced fraud. Yet strict digital requirements can inadvertently exclude women lacking proper documents, phones, or digital literacy, reinforcing old inequities in new forms.

4.3 Persistent Barriers to Digital Inclusion

4.3.1 Socio-Cultural Restrictions

Deep-rooted gender norms, surveillance by male relatives, and social stigmas circumscribe women's access and time online. Technology use especially by adolescent girls is often policed, while caregiving burdens further constrain digital engagement.

4.3.2 Economic Inequalities

Device access is sharply gendered: only around 52% of Indian women have personal mobile phones compared to over 80% of men. Many women use low-quality or shared devices, with priority often given to male household members. This digital divide is most pronounced in rural India and among marginalised groups.

4.3.3 Digital Literacy Gaps

Digital literacy remains uneven: less than half of rural women own mobile phones, and even fewer are proficient in mobile internet or English-language navigation. This results in exclusion from essential digital public goods as schemes migrate online.

4.3.4 Infrastructure Gaps

Connectivity, electricity, and affordable data are persistent barriers particularly for tribal, remote, and low-income households. Mobile internet gender gaps in South Asia reach up to 32%, highlighting persistent structural disparities.

4.4 Risks and Ethical Challenges

4.4.1 Privacy and Data Protection Concerns

Concerns over surveillance by families, apps, and government portals, and leakage of sensitive reproductive health data, discourage women's digital participation, especially in stigmatised areas like reproductive health.

4.4.2 Online Harassment and Cyber Violence

Women face heightened risks of cyberstalking, image-based abuse, trolling, and targeted harassment for political or activist participation, amplifying risk aversion and digital withdrawal.

4.4.3 Algorithmic Bias

AI and digital health tools may underestimate women's health risks due to male-centric algorithms and rural data underrepresentation, perpetuating both digital and health inequities.

4.5 Policy Gaps and Transformation Opportunities

4.5.1 Successes in Digital Governance

Policies including Digital India, NDHM, PMGDISHA, DPDPA 2023, and real-time benefit transfers (DBT) have facilitated greater inclusion, transparency, and efficiency in programme delivery, especially for women in welfare and health.

4.5.2 Gaps Identified

Persistent gaps include limited gender-focus in AI and digital policy, inadequate digital skilling for frontline workers (ASHA/ANM), barriers for remote, tribal, migrant, and disabled women, and insufficient grievance redressal mechanisms.

4.5.3 Opportunities

Strengthening gender-inclusive digital skilling programmes, advancing women's digital leadership, promoting AI diversity, supporting safe infrastructure, and mainstreaming women in policy design are essential steps. Expanding affordable, inclusive, language-accessible content and integrating gender audits in digital policy formulation remain critical for sustainable progress.

DISCUSSION

This study set out to investigate how digital technology functions as a catalyst for women's empowerment, reproductive healthcare policy transformation, and broader social change in India, with particular attention to structural barriers, intersecting inequalities, and governance gaps. The findings, drawn from systematic analysis of literature, policy documents, and programme evaluations, confirm that digital transformation has meaningfully expanded women's access to health services, education, and

economic participation — but that these gains are uneven, contested, and inseparable from the social hierarchies they operate within. The following discussion addresses each research question in turn, drawing out theoretical implications and policy directions.

5.1 Technology as an Enabler of Structural Gender Transformation

Addressing RQ1 how digital technologies shape women's empowerment in contemporary India the findings confirm that digital tools function as genuine, if conditional, agents of gender-justice. Consistent with Sen's (1999) concept of 'agency freedom,' digital access enables women to negotiate family, community, and professional boundaries in ways that were previously constrained. The findings show that digital education expands women's occupational choices, mHealth tools improve health decision-making capacity (Borges do Nascimento et al., 2025), and digital financial platforms increase economic autonomy (Kulkarni & Ghosh, 2021). However, the findings equally confirm that digital exposure alone cannot overcome patriarchal structures: empowerment is only sustainable when digital access is accompanied by concurrent support for literacy, financial inclusion, and community acceptance. This aligns with Kabeer's (1999) framework, which positions empowerment as transformation in underlying power relations rather than mere access to resources.

5.2 Reproductive Healthcare: Digital Innovations and Cautionary Realities

Addressing RQ2 what roles digital platforms play in transforming reproductive healthcare delivery the findings demonstrate significant but uneven progress. Telemedicine, AI-based diagnostics, and mobile health programmes such as Kilkari, mMitra, and the PMMVY portal have improved access to antenatal care, counselling, and timely referral, particularly in rural and low-resource settings (Ashokan Naidu, 2024, Laar et al., 2024). These platforms represent a genuine policy advance: PMMVY's digital beneficiary tracking has improved transparency and reduced fraud (Nandan et al., 2025) and eSanjeevani has enabled millions of teleconsultations that would otherwise require prohibitive travel. However, as feminist scholarship consistently warns, techno-solutionist framings obscure persistent exclusions. Dalit, tribal, migrant, and adolescent women frequently lack the autonomous device access, literacy, or documentation required to benefit from these systems. Femtech platforms and AI diagnostics, while expanding choice for some, risk reinforcing gendered surveillance and data commodification if not subject to rights-based governance frameworks (Radhakrishnan, 2021; Tamrat et al., 2024). The findings thus confirm that digital innovation in reproductive healthcare is necessary but insufficient without structural transformation in access conditions.

5.3 Intersecting Inequalities and the Digital Gender Divide

Addressing RQ3 and RQ4 how marginalised women experience digital inclusion and what barriers inhibit equitable access the findings confirm that the digital gender divide is not a single phenomenon but a layered set of exclusions shaped by intersecting social hierarchies. In line with Crenshaw's (1989) intersectional framework, caste, class, rurality, marital status, and age each mediate the conditions under which women can access, use, and benefit from digital tools. Dalit and Adivasi women consistently report the lowest smartphone ownership rates and the highest levels of digital exclusion, compounded by infrastructure deficits and social restrictions on device use (Islam & Manchanda, 2022). The findings further reveal a persistent gap between access and meaningful use: even where connectivity exists, patriarchal household norms, digital literacy deficits, and fear of online harassment inhibit women's substantive digital participation (Scott et al., 2021). These findings reinforce that targeted, differentiated policy interventions are essential a single universal digital inclusion policy cannot adequately address the multiply-marginalised.

5.4 Digital Safety, Online Violence, and Women's Participation

The governance dimensions of digital safety connect directly to this study's aim of identifying policy gaps impeding gender-equitable digital futures (RQ5). Online violence including cyberstalking, trolling, deepfakes, and non-consensual image sharing disproportionately affects women activists, journalists, and political leaders, functioning as a structural mechanism for suppressing women's digital participation (Lal et al., 2024). The Digital Personal Data Protection Act (2023) and India's expanding cybercrime portal infrastructure represent important legislative steps, but rural awareness and enforcement remain critically insufficient (Nigam 2024). The findings confirm that online safety is not a peripheral concern but a foundational precondition for meaningful digital inclusion: women who face harassment withdraw from digital spaces entirely, negating the empowerment potential that policy seeks to deliver. Rights-based, gender-sensitive digital governance frameworks are therefore essential, not optional additions to digital policy.

5.5 Policy Implications and Reform Opportunities

Addressing RQ5 what policy innovations are needed to foster gender-equitable digital futures the findings point to five interconnected reform priorities. First, universal digital literacy programmes must move beyond generic content to deliver accessible, localised, and women-centric curricula through trusted community institutions such as SHGs, Anganwadis, and rural digital centres, with completion incentives to sustain engagement. Second, AI and digital health platforms must be subjected to mandatory gender audits, built with representative datasets that include rural, Dalit, tribal, and disabled women, and tested

for algorithmic bias before deployment at scale (John et al., 2024). Third, digital rights and reproductive data privacy must be strengthened through enforceable regulatory frameworks, specific guidelines on the use of health data, and public awareness campaigns that reach women with low literacy (Varon & Peña, 2021). Fourth, equitable access for the most marginalised women requires structural investment: subsidised devices, free or low-cost data access, offline-capable health applications, and community health ambassadors in remote regions. Fifth, frontline health workers ASHAs, ANMs, and Anganwadi workers must be equipped with devices, digital skills, and incentive structures that reduce administrative burdens and enable them to serve as digital bridges for the communities they serve. Taken together, these reforms reflect a shift from connectivity as an end in itself to connectivity as a foundation for substantive gender justice.

CONCLUSION

India's digital transformation represents an unprecedented opportunity for advancing gender equality and social change. Digital tools expand women's agency, enhance reproductive healthcare outcomes, streamline government welfare, and enable new forms of participation and economic mobility yet persistent inequalities limit full realisation of this potential. Ensuring a gender-just digital future requires policies grounded in feminist, rights-based, and intersectional thinking, with inclusive design, meaningful skill-building, robust data privacy, and systemic efforts to address structural barriers. Ultimately, empowering women through technology catalyses not only individual transformation but broader community and national progress. Equitable digital futures depend on collaborative action among government, technology developers, civil society, and women's collectives, guided by feminist principles of justice, inclusion, and agency.

ACKNOWLEDGEMENTS

The authors acknowledge the Indian Council of Social Science Research (ICSSR) for granting the Senior Fellowship that provided the academic foundation for this research. Grateful acknowledgement is also extended to the Department of Women's Studies and the Centre for Women's Studies, Alagappa University, Karaikudi, Tamil Nadu, for institutional support and facilitation throughout the research process.

DISCLOSURE STATEMENT

The authors declare that there are no conflicts of interest, financial or otherwise, associated with this research. This study was conducted solely for academic and scholarly purposes and did not receive

funding from commercial, corporate, or partisan organisations. All views expressed are those of the authors alone.

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