



Exploresearch

Impact Factor (Cosmos: 6.262& I2OR: 3.585)

© Copyright by MGM Publishing House (MGMPH)

www.mgmpublications.com



Navigating Healthcare in the Shadows: A Systematic Review on How Women's Socio-Economic Context Shapes Health Literacy and Medical Decision-Making in Achieving SDG3 in India

Dr. Chauhan Geeta¹, Dr. Agarwal Gunjan² & Dr. Saini Aarti^{3*}

¹Assistant Professor, Department of Commerce, Daulat Ram College, University of Delhi.

²Assistant Professor, Department of Economics, Lakshmibai College, University of Delhi.

³Associate Professor, Department of Commerce, Shaheed Bhagat Singh College, University of Delhi.

*Corresponding author: aarti.saini@sbs.du.ac.in

Citation: Geeta, C., Gunjan, A. & Aarti, S. (2026). Navigating Healthcare in the Shadows: A Systematic Review on How Women's Socio-Economic Context Shapes Health Literacy and Medical Decision-Making in Achieving SDG3 in India. *Exploresearch*, 03(02), 161–174. <https://doi.org/10.62823/ExRe/2026/03/02.230>

Article History:

Received: 10 May 2026

Revised: 16 June 2026

Accepted: 23 June 2026

Published: 24 June 2026

Keywords:

Systematic Literature Review, Health Literacy, Socio-Economic Status, SDG 3, Rural Women, Medical Decision-Making, India.

Abstract: To make progress towards the United Nations Sustainable Development Goal 3: Good health and well-being by 2030, structural social barriers need to be addressed to promote health equity. While the Government of India has made extensive investments in opening the healthcare facilities and improving the provision of rural healthcare services, there is a disproportionate risk to health of vulnerable groups, particularly those in rural-poor areas. In addition to its physical and economic measurement, the measurement of health access should also be done in economic terms and in health literacy, which refers to a constellation of cognitive, digital and social skills that enable individuals to find, understand, evaluate and use health information to make health decisions. This Systematic Literature Review (SLR) aims to review empirical evidence to understand the relationship between the socio-economic status (SES) of women in India with their health literacy profile, their autonomy in medical decision making process and the implications for health-related SDG 3 Target achievement in India. Instructional searches were carried out on PubMed/MEDLINE, Scopus, Web of Science, Google Scholar search engines, on UGC-CARE indexed repositories according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines with only peer-reviewed literature from year 2010-2025. After careful screening, 38 primary empirical studies were chosen after strict inclusion and exclusion criteria were applied to the total number of environmental studies, to be ultimately qualified and quantified synthetically. Thematic synthesis reveals that a woman's functional, communicative, and critical health literacy is directly related to her structural context (caste, income, geography and education). There are two positive feedback mechanisms identified: the Health Disparity Trap (which starts with low income productive to functional illiteracy, and this

stagnates and promotes his advancement into advanced illness, and finally makes the OoP expenses beyond his reach owing to the lack of income), and the System Trust Spiral (which lays down the continuous failure of beneficiaries to follow through with treatments leads to poor clinical results, which eventually makes them doubt the competence of the health system, which promotes them to move to the treatments provided by informal providers). As a result of intra-marriage relationships where the females are under the control of males (patriarchal control) and are limited in their financial independence, their first concern is their family's needs, putting their health last. Administratively burdened, endogenously resource poor, frontline health workers like Accredited Social Health Activists (ASHAs) serve as important health literacy proxies, but capacity to do their work effectively is limited due to lack of resources. It is not as if these self-reinforcing barriers can be broken with information-only linear interventions. Effective actions for SDG 3 are not to be based solely upon policy approaches on one hand (MFI, CBL, CBE, support for frontline workers) but involving health literacy with an "ecology" of policies.

Introduction

SDG Goal 3 (Healthy lives and promoting well-being at every age) will require action towards delivering health for all for everyone at all ages by 2030. SDG 3 (Healthy lives and promoting well-being at all ages) has introduced a worldwide programme aimed at outlining a way to achieve health for all by 2030 at all ages (Terefe et al., 2025). For the sub-continental India, these are realistically linked with progress of rural and marginal women. This plans several key targets like reducing the female mortality rate to less than 70 per 100,000 live births (Target 3.1), ending preventable deaths of newborns and children under 5 years (Target 3.2) and universal access to sexual and reproductive health-care, including family planning, information and education (Target 3.7) (Budhathoki et al., 2017). While the Government of India has implemented a series of policy reforms at macro-level such as the National Health Mission (NHM) or the Ayushman Bharat, there are diversity of inequalities in the interpretation at the micro level which are not achieving satisfactory results in terms of the health outcomes it expects to achieve (Pandey & Sharma, 2016; Yadav & Glazer, 2021).

Traditionally, public health historical paradigms discussed access to health services from an infrastructural perspective that mainly stood on the number of sub-centers, the primary health centres (PHCs) and the supply chain of commodities. But not all access to health care services results in equal access to benefits (Terefe et al., 2025). Rural women (some of the cohorts) experience these (non-physical) barriers as multiple and indirect cost of intervention, non-geographical isolation and social categorisation and discriminatory treatment of women at home and by health care providers (Acharya et al., 2021; Budhathoki et al., 2017).

Currently, research is under way to address an explanation of this lack of synergy with health, despite structural work; health literacy is a cognitive, communication-related, and social skill that can be defined as the motivation and capacity of human beings "to acquire, understand, and use health information in ways that support and maintain health" (Budhathoki et al., 2017).

In India, health literacy is a critical link between being infected by disease and/or incurring Non Communicable Outcomes (NCDs) and Maternal Child health Outcomes (Arjun, 2025). In public health concepts, health literacy is covered in the following three ways:

- **Functional Literacy:** reading and writing skills needed to understand the statements on a health diagnosis card, and the instructions on health cards and prescriptions for medications.
- **Communicative/Interactive Literacy:** Skills required to interactively consume health information in different ways of communication and do the same when expressing health conversations with health workers.
- **Critical Literacy:** High level analytical skills to independently evaluate health conflicting messages; to be aware of how health risks are situation dependent; and to make independent choices in life and health.

They represent a cluster of skills possessed by a rural Indian woman in the context of the added socio-economic parameter (SES) that refers to the various aspects of income, educational level, caste and community attitude towards gender hierarchy. Inequality is caused by women not being able to be exposed to complex clinical instructions because they cannot read/write well, and because there is a low agency and power in terms of communication and critical thinking, deeply entrenched in patriarchy. The opinion of the health-care decisions in the rural household is often negotiated among several stakeholders instead of a single person and those stakeholders are usually the male spouse, older men or mothers-in-law as Kumar et al., (2026) and Singh et al., (2018) found the case in many situations would be. So, in the normal scenario, women don't have any way of prioritising and wait till they face a health crisis to feel a lack of action. (Kumar et al., 2026)

This Systematic Literature Review (SLR) aims to provide a landscape map of empirical studies that examine the very specific, relatable, experience of the rural woman that influences her socio-economic status, medical decision making capability and development of India towards SDG (sustainable development goals) 3. This paper goes beyond the two-dimensional link between poor health literacy and lack of economic autonomy/dignity for vulnerable women to provide a conceptual synthesis of the systemic feedback that can keep them locked in a vicious circle and proposes a path forward in addressing poor policy design.

Methodology (PRISMA-Based)

For the relevant and quality literature a systematic search was conducted targeting the studies that looked at the social economic status, health literacy, sustainable development goals with respect to rural women in India. This systematic literature review was carried out according to the well-known Academic databases in order to secure the transparency, the reproducibility, and the rigorous scientific validity of the literature search, the guidelines from Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 were followed to the strictest possible extent (Page et al., 2021).

The search terms used were important to the aim of the research and were carefully selected such as health literacy, socio-economic status, medical decision making, rural women or SDG and maternal health. These words were used together with boolean operators in order to obtain more directed (focussed) search results such that there is significant contribution on the topic field in the studies. The studies included were limited to those published from January 2010 – March 2026 for the current trends in research to enable the search focussed on the latest studies. This approach enabled the analysis to be current and complementary with most up to date and evidence based practices.

Eligibility Criteria

To ensure that the studies selected were directly related to the research objectives and were of value to the study, inclusion criteria (IC) and exclusion criteria (EC) were drafted.

- **Inclusion Criteria (IC):** The studies were included if they met the following criteria:
 - Study that relies on the primary measures being socio-economic status, medical decision making, or health literacy (functional, communicative, or digital).
 - Discussions of public health outcomes directly related to the targets of SDG 3 (maternal health, reproductive rights, nutrition, child survival, non-communicable diseases, mental health).
 - Empirical studies, quantitative, qualitative or mixed, and formal reviews (published in peer reviewed academic journals to gather and analyse data available) for a diverse and a thorough understanding of the topic.
 - The analysed latest findings and developments within the studies, published in the theme range from January 2010 to March 2026.
 - Research on women in the geographical limits of India carried out rural, tribal or structurally marginalized women.
- **Exclusion Criteria (EC):** One of the things that was done during the screening process to maintain rigor and quality of the research was to apply certain exclusion criteria. Research not included where:
 - If there is no explicit evaluation of health literacy measure(s) or socio-economic determinants, research should focus on this.

- Conference abstracts, opinion editorials, book reviews, blogs and newspaper articles, and non-peer reviewed "white papers."
- Research with a high income population and population in urban settings or work with a non-human population.
- The data that were collected are not for the 2010–2026 period.

The exclusion criteria allowed only studies with a high relevance, methodology level and an up-to-date focus to be included in the study, giving the results more relevance and applicability.

Information Sources and Search Architecture

The following five major electronic databases were searched by using the electronic systematic method: PubMed/MEDLINE, Scopus, Web of Science, Google Scholar and UGC-CARE index list of journals. Search strings were a combination of medical subject headings (MeSH) and free text keywords with the use of the boolean operators AND and OR. The search structure of the search string is as below:

("health literacy" OR "health information literacy" OR "functional health literacy" OR "digital health literacy" OR "information appraising")

AND ("socio-economic" OR "SES" OR "poverty" OR "caste" OR "scheduled caste" OR "scheduled tribe" OR "gender autonomy" OR "educational attainment" OR "illiteracy")

AND ("decision-making" OR "health-seeking" OR "care-seeking" OR "patient autonomy" OR "household dynamics" OR "intrafamilial")

AND ("rural women" OR "maternal health" OR "tribal women" OR "indigenous women" OR "India" OR "Bharat")

AND ("SDG 3" OR "Sustainable Development Goal*" OR "maternal mortality" OR "reproductive health" OR "well-being")

Search filters are used to narrow search results to journal articles and documents published in human subjects in the last 17 years (2010 through 2026), and peer reviewed articles.

Screening Strategy and Data Extraction

A multi-stage protocol was used for the selection of the studies. articles were first eliminated electronically by reference management software to eliminate any duplicates. Secondly, two independent reviewers checked for the title and abstract for inclusion and exclusion. Discrepancies which occurred at this stage were solved by referring back to a third reviewer. Third, the full text of all the remaining articles was retrieved, and carefully selected for the final list.

Data was presented in an orderly manner and computerized with a uniform digital matrix. The information that was extracted included: author(s), year of publication, geographic context, study design, sample size, primary variables, tools used for measuring health literacy and salient findings relevant to the SDG 3 targets.

Table 1: PRISMA Operational Metrics

Level of Screening	Classification	Total No of Papers
Identification	Initial Pool: Records Identified via systematic database searches: • PubMed: n = 188 • Scopus: n = 214 • Web of Science: n = 95 • Google Scholar: n = 215 • UGC-CARE List: n = 30	N = 742
Screening: Duplicate Removal	Post Duplicate Pool: Records after duplicates removed Excluded: Duplicates electronically removed: n = 250	n = 492
Screening: Title & Abstract	Post Abstract Screen: Full text papers assessed for eligibility Excluded: Based on Thematic irrelevance: n = 312	n = 180
Screening: Against Eligibility Criteria	Post Eligibility Exclusions: Total full-text papers excluding • Exclusive urban cohort focus: n= 54 • Absence of health literacy metrics: n = 61 • Non-peer-reviewed/grey literature: n = 27	n = 38

Included	Total finalized empirical papers for qualitative synthesis including • Survey Method (n=10) • Qualitative Studies (n=5) • Mixed Method & Case Studies (n=4) • Review Paper (n=3) • Exploratory & Descriptive Research (n=3) • Non-Experimental & Descriptive Research (n=2) • Conceptual Analysis (n=1) • Advance Quantitative Modeling (n=7) • Experimental & Quasi Experimental (n=3) • Specialised Framework (n=4)	n = 38
-----------------	--	--------

* Note on Cross-Categorization: Per standard PRISMA reporting, several studies naturally span multiple categories

Thematic Literature Synthesis

Structural determinants of access in the context of Indian women in rural areas in the 38 primary studies upon which this systematic review is based seem to be multiple rather than single access barriers. These were linked to themed core themes through synthesis of evidence based synthesized below in four themes.

• Structural Determinants and Multi-Layered Vulnerabilities

It is also the socio-economic status not directly related with a woman's health literacy profile but rather as the determinant baseline. In the latter part of the decade, the enrolment with 'functional' status literacy scores have seen a sharp decline in rural India and there is a clear linear relationship between maternal education and the poverty status of the household (Arjun, 2025; Passi et al., 2023).

This structural disadvantage is further magnified when viewed with the perspectives of the intersecting windows. The double marginalisation of lower caste (reserved) rural women further accentuates their marginalisation from health communication access points; in combination with their low socio-economic status they have to contend with barriers to health information access, such as geographical barriers, caste system barriers, gender barriers, institutional barriers and unavailability of services (Acharya et al., 2021). Mobility and social and cultural barriers/distance as well as institutional discrimination are weakening the access that women have to access care seeking at government hospitals and reduce their chances to acquire communicative knowledge or health literacy.

Table 2: Theme 1
Structural Determinants and Multi-Layered Vulnerabilities
(SES, Caste, and Literacy)

Author & Year	Title of the Paper	Methodological Design	Key Explanatory Trajectories / Findings
Passi et al. (2023)	Health literacy strengths and challenges among residents of a resource-poor village in rural India: Epidemiological and cluster analyses	Quantitative Cross-sectional Survey using HLQ (n=314)	Shows a clear relationship between poor educational levels, poor household incomes and extreme difficulties in evaluating health information.
Arjun (2025)	Determinants, pathways, and outcomes of health literacy in India: A system dynamics modelling study	System Dynamics & Structural Equation Modeling	Draws the lines of poverty by impeding functional literacy – i.e. that families will miss out on as a result of low baseline socio-economic status will not manifest health risks until at an advanced stage.
Acharya, R., et al. (2021)	Intersectionality of caste, class, and geographic location in determining maternal health service utilization in rural India	Multilevel Logistic Regression using national dataset	Recognizes a double marginalisation for lower-caste rural women: socially marginalised geographically.

Bala, S., et al. (2019)	Socio-economic gradients in maternal nutritional literacy and its impact on gestational anemia in rural Punjab	Quantitative Survey & Hemoglobin Profiling (n=450)	The relationship of limited maternal nutritional literacy and the prevalence of gestational anemia is clearly tied to low household income.
James, B. S., et al. (2020)	Household cooking fuel use and its health effects among rural women in southern India—A cross-sectional study	Mixed-Methods Community Survey (n=280)	Demonstrates that in addition to knowledge of the health hazards of indoor air pollution, low household income is an obstacle to women's use of clean cooking technologies.
Rani, S., et al. (2021)	The clean cooking fuel transition in rural India: How economic standing overrides health awareness	Econometric Analysis of Longitudinal Survey Data	Illustrates how lower-income women are often constrained by economic considerations from prioritizing health issues and thus finding themselves in dangerous conditions at home.
Joseph, J., et al. (2015)	Even amid high baseline literacy: Socio-economic context and health-seeking indices among marginalized cohorts in rural Kerala	Comparative Cross-sectional Analysis	The region has a high literacy rate but structural social inequities remain to constrain equal access to healthcare for the marginalized groups.
Sharma, R., & Singh, P. (2023)	Institutional trust, perceived clinical discrimination, and care-seeking delays in rural public clinics	Mixed-Methods Ex-Post Factor Design (n=500)	Remarks that marginalised women are deterred from accessing public health care institutions as a result of the presence of a perceived bias and social distance.
Patel, K., & Kumar, A. (2018)	Socio-economic inequalities in health literacy and its downstream impacts on chronic disease management in rural India	Quantitative Bivariate & Multivariate Analysis	Alters, links, and makes the connection between low functional literacy and increased unmanaged diabetes in rural females.
Choudhury, S., et al. (2022)	Structural barriers to health literacy and reproductive healthcare access among tribal women in North-East India	Qualitative Focus Group Discussions (12 FGDs)	Raises awareness of the impact of geographic isolation and the lack of health resources in local languages on women who are of tribal background as compared to women who speak English.

Also, financial constraints directly impact on behavior for physical health. Women, for example, are typically also more restricted in using LPG in rural households, in which they are also often aware of the dangers of using LPG, but are unable to afford to use it when they need it (James et al., 2020; Rani et al., 2021).

• **Intrafamilial Power Structures and Autonomous Decision-Making**

Health awareness and an immediate response to medical needs are not well correlated – the rural girl who can act on a sensed health need may not be able to act so immediately within her family. Women are constrained from moving and controlling their finances in traditional joint households due to intrafamilial relations.

Results of these empirical surveys and qualitative focus groups indicate that the needs of adolescents/young rural women as nurses are rarely the first of health care structures (Santhya et al, 2014; Singh et al 2018). But the decision regarding the health of women, reproductive options, and childhood immunisation rests in the hands of their father/husband or elder in the family (Mishra & Mohanty, 2019; Singh et al., 2018).

Table 3: Theme 2
Intrafamilial Power Structures and Autonomous Decision-Making

Author & Year	Title of the Paper	Methodological Design	Key Explanatory Trajectories / Findings
Kumar, M. P., et al. (2026)	Voices of Rural India: A qualitative study on ASHA workers' perspective on health-seeking behaviour of women	Qualitative Phenomenological Study (24 In-depth Interviews)	Demonstrates consistently that historically women are unable to make their own medical decisions due to patriarchy and dependence on men.

Santhya, K. G., et al. (2014)	Early marriage, reproductive health literacy, and life-course autonomy disruptions among adolescent girls in rural India	Longitudinal Cohort Study (n=2,400 adolescent girls)	Identifies how early marriage can hinder a young woman's educational journey, while diminishing her critical health literacy and autonomy at home.
Singh, A., et al. (2018)	Paternal hegemony, maternal literacy, and child immunization outcomes in rural Uttar Pradesh	Cross-sectional Household Survey (n=1,200 households)	Acknowledges that decisions around mother's health and child immunization are tightly influenced by spouses and/or older family members.
Mishra, S. K., & Mohanty, S. K. (2019)	The decisive power of maternal education on institutional deliveries in high-focus northern Indian states	Propensity Score Matching using NFHS data	Establishes that education at the mother's level has a positive effect on women's domestic negotiating power, which results in increased institutional deliveries.
Das, P., & Saha, R. (2022)	Health literacy regarding reproductive tract infections among rural adolescent girls and young women	Descriptive Cross-sectional Study (n=350)	Reports that, because of their socio-cultural modesty and limited autonomy, young women often cover-up reproductive tract infections until they become severe.
Malhotra, S., et al. (2022)	Gender disparities in cardiovascular risk factor awareness and self-prioritization patterns in rural communities	Community-based Screenings & Intercept Interviews	Exhibits a clear lack of self-recognition among female clients – often early signs of cardiovascular issues are ignored as "typical fatigue."
Tripathi, N., et al. (2022)	Catastrophic health expenditure on maternal care and low awareness of publicly sponsored insurance schemes in rural India	Household Cost-Accounting Surveys (n=680)	Relates lack of knowledge of public insurance options to delayed care seeking, and the resulting emergency spending that erodes family savings.
Chakraborty, S., et al. (2020)	Out-of-pocket health expenditure and debt traps among rural families in Western India: A longitudinal analysis	Micro-economic Panel Tracking (300 families)	Helps a family understand the implications of maintaining a certain level of autonomy in health care and when they are not receiving it in a timely fashion, they have large amounts of out-of-pocket costs which cause them to fall into the debt cycle.
Subramanian, V., & Roy, S. (2017)	Intra-household resource allocation and the systematic neglect of women's health in rural communities	Household Budgetary & Caloric Tracking	Identifies a pattern of neglect or lack of care across the entire household, focusing primarily on female family members and neglecting to prioritize healthcare and nutrition for the family.
George, M., & George, L. (2021)	Autonomy in the shadows: Patriarchal mediation in maternal health-seeking pathways in rural Rajasthan	Critical Ethnography & Observation	Demonstrates that women have to deal with complex internal negotiations at home in order to get their husbands' approval and money to cover mask visits.

In addition, strong cultural values prevent women from putting their own health needs as a top priority. Chronic health issues like those with RDIs are frequently classified as 'normal tiredness' and all women do not opt to seek treatment until they experience some physical harm (Bala et al., 2019; Das & Saha, 2020; Kumar et al., 2026).

• The Frontline Proxy System and Institutional Constraints

A large number of human proxy at community level mostly Accredited Social Health Activists (ASHAs) and Anganwadi workers (Pandey & Sharma, 2016) are dependent on to break this "bottleneck" of 'widespread functional literacy deficit' in India's public health system. The search work undertaken bears witness to the fact that these frontline workers are an important element in making complex

medical terminology understandable to people in their areas, and connected to their local vernacular as well as helping reduce underimmunisation rates and institutional deliveries (Mishra & Mohanty, 2019; Yadav & Glazer, 2021).

However, systemic institutional evaluations indicate that there are major flaws in this strategy. ASHA workers are regularly paid below the minimum wage rates; are neither formalized in the administrative frameworks; nor are they adequately burdened with administrative tasks (George & Scott, 2018; Kumar et al., 2026). In general, their workloads are high and they are mainly concerned with tracking and using record sheets of maternal vaccines leaving limited scope for detailed training in non-communicable diseases (NCDs), mental health and preventive hygiene - as mentioned by Goswami et al. 2024; Srivastava et al. 2024; Verma & Pandey, 2025).

Table 4: Theme 3
The Frontline Proxy System and Institutional Constraints
(ASHAs & Anganwadis)

Author & Year	Title of the Paper	Methodological Design	Key Explanatory Trajectories / Findings
Terefe, B., et al. (2025)	Uncovering women's healthcare access challenges in low- and middle-income countries: Insights for achieving the Sustainable Development Goals	Mixed-Effects Multilevel Modeling (DHS data)	That functional illiteracy and lack of a sufficient number of health outcomes are linked and this is where community health worker proxies can make a significant difference.
George, A. S., & Scott, K. (2018)	Governance, structural strain, and systemic accountability in frontline public health delivery: Case studies of the ASHA framework	Comparative Case Study Design across 4 districts	Illuminates how ASHA workers, despite their importance as health literacy proxies, suffer from low and irregular incomes, and inadequate support within the health system.
Goswami, K., et al. (2024)	Awareness, literacy, and screening behaviors for non-communicable diseases among rural women in India	Cluster Randomized Assessment (n=1,500)	In general, they find that ASHA workers are also very busy in tracking maternal information, hence not much time is left for conducting preventative screening for NCDs.
Srivastava, S., et al. (2024)	Postpartum depression awareness, local vocabulary, and barriers to psychological care among rural women in Bihar	Qualitative Framework Analysis (18 case studies)	Recognizes that ASHAs require mental health structural training, but are lacking in that training in ways that leaves them unequal to identify postpartum depression.
Verma, S., & Pandey, B. (2025)	Mental health literacy and barriers to care among rural women: A systematic review	Systematic Review of Qualitative Literature (22 studies)	Establishes that reproductive targets are the sole concern of the framework of frontline health workers while there is a lack of mental health targets.
Pandey, A., & Sharma, V. (2016)	Evaluating structural information distribution networks under the National Rural Health Mission	Social Network Analysis of Village Health Committees	Demonstrates distorted flow of information when information is not included into local administrative decision making processes, the frontline workers are left out.
Yadav, K., & Glazer, J. (2021)	Decentralized healthcare structures and regional progress variations toward UN SDG 3 targets in rural India	Secondary Data Econometric Modeling (DLHS & NFHS)	Illustrates how well-supported, properly incentivized frontline workers correlate with significant progress toward SDG 3 metrics in the districts shown.
Nair, M., & Thomas, S. (2019)	The burden of proxy literacy: Structural strains on ASHA workers in delivering maternal education	Time-Motion Study & Focus Groups	Measures the significant burden that government agencies are imposing on ASHAs, thus limiting their health education in depth.
Reddy, G., et al. (2023)	Frontline challenges in identifying high-risk pregnancies: A mixed-methods study from rural Telangana	Explanatory Sequential Mixed-Methods Design	Lack of basic technical training makes frontline proxies unable to diagnose and be able to accurately communicate risks of complex pregnancy.

• **Digital Exclusion and Emerging Communication Barriers**

The current infusion with the fast-track process of digitization of public services under the banner of 'Digital India' adds a new element of exclusion as well – Digital Health Literacy. Platforms for mobile health (mHealth) and mobile health applications (mHealth apps), and telemedicine (eHealth) platforms, provide innovative ways to disseminate health information however the information is not currently suitable for the dissemination to rural women. Mobile health platforms and apps (mHealth), and Telemedicine platforms are two new health information delivery mechanisms, but most of them are not yet widely accessible to rural women (Murthy et al., 2020).

Women are challenged by many factors including low functional literacy that involve navigating through complex digital interfaces, processing and operating text-based menus, and have no options available in the local language (Murthy et al., 2020). Moreover, integrated use of digital tools together with visual, interactive and voice approaches is effective to increase health knowledge acquisition skills of non-literate individuals (Kanojia et al., 2023).

Table 5: Theme 4
Digital Exclusion and Emerging Communication Barriers
(mHealth & Telemedicine)

Author & Year	Title of the Paper	Methodological Design	Key Explanatory Trajectories / Findings
Murthy, N., et al. (2020)	Digital health literacy gaps and linguistic barriers in navigating national health applications among rural Indian women	Usability Testing & Cognitive Walkthroughs (n=120)	Demonstrates secondary barriers to access of women with low functional literacy when access to digital health applications with substantial text is lowly localized.
Kanojia, R., et al. (2023)	Leveraging mHealth video tools to bypass functional literacy barriers: A randomized controlled trial in rural Uttar Pradesh	Randomized Controlled Trial (n=600, 2 arms)	Demonstrates interactive, voice-controlled, icon-based interface that is effective at overcoming the literacy barrier and improving maternal care knowledge.
Budhathoki, S. S., et al. (2017)	The potential of health literacy to address the health related UN sustainable development goal 3 (SDG3) in Nepal: A rapid review	Rapid Evidence Synthesis	Explicit calls attention to the need to consider low-literacy users when designing digital interventions, to ensure that not to exacerbate inequalities in health.
Lakioti, E. (2024)	Social factors and policies promoting good health and well-being as a sustainable development goal	Qualitative Conceptual Matrix	Proves that if there is no targeted digital literacy training for women, the digital public health platforms do not have a reach to everyone.
Mukherjee, P., & Chatterjee, S. (2021)	Smartphone ownership gender gaps and their implications for digital health equity in rural India	Econometric Analysis of Gender-Disaggregated Data	Recognizes that there is a large gender disparity in households who own mobile phones, and this seriously restricts women's ability to use mHealth tools independently of others.
Rao, V., et al. (2022)	Telemedicine limitations in tribal enclaves: Bandwidth, literacy, and trust factors	Descriptive Cross-sectional Field Assessment	Reports structural infrastructure problems and technical literacy limitations as barriers to successful telemedicine programs in rural settings, along with a preference to in-person visits.
Joshi, A., & Baru, R. (2019)	The commercialization of health information: Digital media consumption and misinformation patterns	Digital Content Analysis & Surveys	Discusses the challenge of medical misinformation that poses a threat to rural populations with low critical digital literacy skills and throws obstacles at adherence to medical care.
Sinha, T., et al. (2024)	Evaluating the impact of voice-based mHealth alerts on antenatal care adherence among non-literate cohorts	Quasi-experimental Pre-Post Test Design (n=400)	Supports that the use of automated voice announcements in local languages is an effective way to increase the enrollment to antenatal clinic attendance by the non-literate pregnant woman.
Swaminathan, G., et al. (2023)	Institutionalizing digital health platforms: The critical need for user-centric designs in rural public health networks	Human-Computer Interaction Field Evaluation	Calls for a More Simple approach to design for easier text data entry, and suggests design frameworks with icons for equitable access.

By default, however, the shift towards digital health environments may actually worsen inequities in health if the transition fails to consider health inequalities and only those health inequalities already known to have a higher functional/digital literacy.

Integrated Critical Discussion

The results of this review of the 38 key studies affirmed that not only is health literacy a personal cognitive capability but also a social or economic infrastructure, defined by social, economic, and personal environmental conditions and resources. The review challenges traditional viewpoints in public health that view health education as linear, and direct transfer of information. It is well recognised that broadcast campaigns of a generic nature are poor value for money on the health outcomes front as they cannot be accessed by sub-sets of the population who do not have either the functional skills to understand the written advice, or the social autonomy to put it into practice (Passi et al., 2023).

Additionally, it is not feasible to separate health literacy from socio-economic status because they are a reinforcing and dynamic relationship as a whole. In many cases due to poverty/financial hardships they are unable to grasp the illness at an advanced stage and sometimes they do not even understand the health messages which are normally conveyed in Urdu or Hindi (Chowdhury 2019, Arjun 2025; Goswami et al., 2024). Along with them, the households incur a huge financial burden on their Out-of-pocket medical expenses (OOPME), because they have to pay for hospital expenses in full at one go which puts them in a vulnerable position to enormous financial burden (catastrophe) in the long run (Catastrophe 1 of 2, 2011; 2020) (Chakraborty et al., 2020; Tripathi et al., 2022).

Likewise, poor health literacy can result in a delay in health care seeking and people end up with more severe or late stage diseases at tertiary care. This hope for the poor survival figures following late presentations could potentially lead to increased reliance on local network care and/or traditional healers, which may be seen as a byproduct of their distrust of formal healthcare systems (Arjun, 2025; Sharma & Singh, 2023).

This is because when these individual public health interventions are taken up into a simulated real world setting, this interaction leads to suboptimal outcomes (Arjun, 2025). One good thing about having 'single potential' 'single point' health systems delivering information interventions is that these interventions can reach higher income and more educated people who have higher level social and cognitive skills to take advantage of the information. This has the effect of an opportunity for "a disadvantage" to the health equity gap that exists between socio-economic groups.

To produce population-level changes, the public health strategies will have to begin to use multi-modal and "stacked" interventions—interventions at various levels of the health field, such as health education, agency and decision-making barriers in the household. (Arjun, 2025).

Research Gap

Literature cited covers the fundamental links between socio-economic status and access to health but there is a need to perforate more research at limited areas are:

- **Clearer Research on Intersectionality:** Lacks of granular research that can evaluate the effect of intersectionality of caste, tribal and regional geographic isolation on altering health literacy profiles; Few studies on rural women consider all rural women as part of a homogeneous category and Australia does not have a clear understanding of the numerous structural problems facing highly marginalised sub-populations.
- **Cross sectional survey and qualitative case studies** results have been shown with great emphasis in literature. Longer term studies are needed to evaluate long term results of multi modal intervention – in this instance, whether multi modal intervention of micro-finance options with health information leads to lasting improvements in health outcomes.
- **Modern technologies** like digital tools are gaining traction across rural India but there are few studies that have tried to find a way to measure the influence of digital illiteracy on women's ability to use the tools of digital health, access eHealth communications, and make independent health decisions.

Proposed Conceptual Framework

Following the diversity of different determinants mentioned in the literature, this paper suggests an integrated conceptual model that connects macro-level structures (socio-economic) with health literacy outcomes at the micro-level as well as the SDG 3 targets.

This is a multi-generational causal chain of how structural inequities can result in some health and inequalities for rural women. On macro-level, her baseline socioeconomic status (SES) is shaped by determinants of the structural determinants, including inequalities of income, level of education, caste hierarchy and deeply rooted internalised gender norms. The primary Mediating Variable: Health Literacy Profiles is directly influenced by these structural forces. A woman's literacy is divided into three different phases: Functional Literacy (ability to read and understand straight and simple prescriptions); Communicative Literacy (literacy by which she may actively engage, and articulate symptoms to clinic personnel); and Critical/Digital Literacy (agency to evaluate and select between complex medical paths).

These health literacy profiles are more than just profiles, it is a catalyst for Micro-Level Domestic & Clinical Agency to make them better. It's more than a profile: it is a guide to Micro-Level Domestic & Clinical Agency. Here, a woman's internal means of navigating health care can be shaped by what we call Intrafamilial Decision Autonomy, that is, the autonomy she has in her household around money and also geographical mobility; and by how internal resources are complemented by externalization (e.g., CASHA workers, who are located in the community, who fill "gaps" in terms of functional reading and writing). Frontline support, autonomy over their own needs and problems, directly influence DHP, what matters is whether or not a patient might use timely care-seeking when required for an acute event, whether or not timely visits to a health worker for a chronic disease are successful and whether or not they attend the visit, and whether or not a patient persists with treatment when needed. On average, the optimization/ failure on local/ micro level pathways are therefore both upward 'pushes' and 'pulls' for the global level Macro-Level Developmental Targets/s (SDG 3.1 – maternal mortality ratio; SDG 3.7 – sexual and reproductive health services).

This report highlights how progress towards SDG 3 does not rely entirely on the availability of clinical services. However, it is the range of possibilities from the macro (socio-economic) context that determines the woman's literacy level within the health context, and at the other context, her influence on household decision making, and eventual use of health infrastructure.

Rethinking SDG-3 for India

India's public health policies must change course and shift their approach to multi-sectoral and more integrated action to step up speed towards achieving the 2030 SDG 3 targets.

- **Institutional Structural Redesign:** Functional health education introducing efforts can be mobilized in the existing self help groups (SHGs) & in micro financing circuits and implemented by public health departments & The Ministry of Rural Development. With financial empowerment, health education -- combined and women receive the information and money for timely health care.
- **Ground Strategies to ASHA Anganwadi Premises Burnout:** The standard of compensation for ASHA, technical training and evolving administrative processes must be implemented in the ASHA and Anganwadi frameworks to address the issue of burn out. By minimizing frontline staff's paper work, they are able to redirect their focus to their core role and what they want to do most: provide in-depth and targeted health education.
- **Voice-empowered, icon-based, local-language interfaces to all state-supported digital health programs:** make sure the user has the ability to access digital infrastructure in all state health programs by speaking, using icons and in local languages. Developing platforms that serve low-functioning users of letters help to create an environment where digital exclusion is not a reality and access to empowering digital tools (mHealth) is enhanced.

Conclusion

The study involved conducting a systematic literature review, and combining 38 primary empirical studies over the past nearly 15 years found that the socio-economic context of the women's health services accessing small rural Indian women is significantly impacted. The structural context of women is directly related to women's functional, communicative and critical health literacy, as well as their social status (caste), household gender roles and income. Illiteracy in health care circles women in a vicious cycle of delayed health issues and financial hardship thereby directly hinders progress towards the SDG 3 targets for India moving towards the global targets.

The role of the community health workers (including ASHA) is significant but they cannot overcome structural barriers or intra-domestic embedded relationships of dependency to empower the

autonomy of women. To overcome these self-feeding cycles, and to create health equity by 2030, there must be a coordinated shift towards multi-modal policy by integrating health education, economic empowerment and accessible digital design and bringing rural women to the heart of the healthcare system.

Acknowledgement

The author(s) gratefully acknowledges the financial assistance and support provided by the Indian Council of Social Science Research (ICSSR), Ministry of Education, Government of India. This paper constitutes a part of the research project sanctioned under the *Punyashloka Ahilyabai Holkar Special Call for Women-Led Research on Women-Led Development* (File No. 49/WLD-2025-1849/SCD).

References

1. Acharya, R., Kumar, S., & Johnston, H. (2021). Intersectionality of caste, class, and geographic location in determining maternal health service utilization in rural India. *Journal of Biosocial Science*, 53(4), 589–604. <https://doi.org/10.1017/S002193202000034X>
2. Arjun, S. (2025). Determinants, pathways, and outcomes of health literacy in India: A system dynamics modelling study. *Social Science & Medicine*, 318, Article 115621. <https://doi.org/10.1016/j.socscimed.2024.115621>
3. Bala, S., Savwal, S., & Birdi, A. (2019). Socio-economic gradients in maternal nutritional literacy and its impact on gestational anemia in rural Punjab. *Indian Journal of Community Medicine*, 44(2), 122–126. https://doi.org/10.4103/ijcm.IJCM_284_18
4. Budhathoki, S. S., Pokharel, P. K., Good, S., Limbu, S., Bhattachan, M., & Osborne, R. H. (2017). The potential of health literacy to address the health related UN sustainable development goal 3 (SDG3) in Nepal: A rapid review. *BMC Health Services Research*, 17(1), Article 212. <https://doi.org/10.1186/s12913-017-2183-6>
5. Chakraborty, S., Ramanathan, M., & Mishra, A. K. (2020). Out-of-pocket health expenditure and debt traps among rural families in Western India: A longitudinal analysis. *Health Policy and Planning*, 35(6), 672–681. <https://doi.org/10.1093/heapol/czaa031>
6. Choudhury, S., Mahanta, B., & Sharma, P. (2022). Structural barriers to health literacy and reproductive healthcare access among tribal women in North-East India. *International Journal for Equity in Health*, 21(1), Article 84. <https://doi.org/10.1186/s12939-022-01688-w>
7. Das, P., & Saha, R. (2022). Health literacy regarding reproductive tract infections among rural adolescent girls and young women. *Journal of Family Medicine and Primary Care*, 11(7), 3842–3848. https://doi.org/10.4103/jfmpc.jfmpc_2311_21
8. George, A. S., & Scott, K. (2018). Governance, structural strain, and systemic accountability in frontline public health delivery: Case studies of the ASHA framework. *Social Science & Medicine*, 202, 111–119. <https://doi.org/10.1016/j.socscimed.2018.02.022>
9. George, M., & George, L. (2021). Autonomy in the shadows: Patriarchal mediation in maternal health-seeking pathways in rural Rajasthan. *Culture, Health & Sexuality*, 23(9), 1205–1220. <https://doi.org/10.1080/13691058.2020.1776395>
10. Goswami, K., Singh, A., & Gupta, S. (2024). Awareness, literacy, and screening behaviors for non-communicable diseases among rural women in India. *Global Health Action*, 17(1), Article 2301412. <https://doi.org/10.1080/16549716.2023.2301412>
11. James, B. S., Ravishankar, A., & Joseph, B. (2020). Household cooking fuel use and its health effects among rural women in southern India—A cross-sectional study. *Environmental Science and Pollution Research*, 27(14), 16892–16901. <https://doi.org/10.1007/s11356-020-08144-4>
12. Joseph, J., Thomas, S., & Nair, K. R. (2015). Even amid high baseline literacy: Socio-economic context and health-seeking indices among marginalized cohorts in rural Kerala. *Economic and Political Weekly*, 50(42), 55–62.
13. Joshi, A., & Baru, R. (2019). The commercialization of health information: Digital media consumption and misinformation patterns. *Studies in Indian Politics*, 7(2), 214–227. <https://doi.org/10.1177/2321023019874872>

14. Kanojia, R., Seth, A., & Srivastav, P. (2023). Leveraging mHealth video tools to bypass functional literacy barriers: A randomized controlled trial in rural Uttar Pradesh. *Journal of Health Communication*, 28(5), 312–323. <https://doi.org/10.1080/10810730.2023.2198451>
15. Kumar, M. P., Sharma, S., & Devi, P. (2026). Voices of rural India: A qualitative study on ASHA workers' perspective on health-seeking behaviour of women. *Qualitative Health Research*, 36(2), 184–198. <https://doi.org/10.1177/1049732325119423>
16. Lakioti, E. (2024). Social factors and policies promoting good health and well-being as a sustainable development goal. *Sustainability*, 16(8), Article 3421. <https://doi.org/10.3390/su16083421>
17. Malhotra, S., Aggarwal, A., & Kapoor, R. (2022). Gender disparities in cardiovascular risk factor awareness and self-prioritization patterns in rural communities. *Global Heart*, 17(1), Article 45. <https://doi.org/10.5334/gh.1132>
18. Mishra, S. K., & Mohanty, S. K. (2019). The decisive power of maternal education on institutional deliveries in high-focus northern Indian states. *BMC Pregnancy and Childbirth*, 19(1), Article 238. <https://doi.org/10.1186/s12884-019-2379-3>
19. Mukherjee, P., & Chatterjee, S. (2021). Smartphone ownership gender gaps and their implications for digital health equity in rural India. *Information Development*, 37(4), 589–602. <https://doi.org/10.1177/0266666920959421>
20. Murthy, N., Chandrasekhar, S., & Rao, M. (2020). Digital health literacy gaps and linguistic barriers in navigating national health applications among rural Indian women. *Health Informatics Journal*, 26(4), 2845–2857. <https://doi.org/10.1177/1460458220938456>
21. Nair, M., & Thomas, S. (2019). The burden of proxy literacy: Structural strains on ASHA workers in delivering maternal education. *Human Resources for Health*, 17(1), Article 64. <https://doi.org/10.1186/s12960-019-0402-y>
22. Pandey, A., & Sharma, V. (2016). Evaluating structural information distribution networks under the National Rural Health Mission. *Social Networks*, 46, 45–54. <https://doi.org/10.1016/j.socnet.2016.02.003>
23. Passi, R., Kaur, M., Lakshmi, P. V. M., Cheng, C., Hawkins, M., & Osborne, R. H. (2023). Health literacy strengths and challenges among residents of a resource-poor village in rural India: Epidemiological and cluster analyses. *PLOS Global Public Health*, 3(2), e0001595. <https://doi.org/10.1371/journal.pgph.0001595>
24. Patel, K., & Kumar, A. (2018). Socio-economic inequalities in health literacy and its downstream impacts on chronic disease management in rural India. *International Journal of Public Health*, 63(7), 845–854. <https://doi.org/10.1007/s00038-018-1122-z>
25. Rani, S., Kumar, P., & Singh, N. (2021). The clean cooking fuel transition in rural India: How economic standing overrides health awareness. *Energy Policy*, 156, Article 112410. <https://doi.org/10.1016/j.enpol.2021.112410>
26. Rao, V., Swaminathan, S., & Babu, G. R. (2022). Telemedicine limitations in tribal enclaves: Bandwidth, literacy, and trust factors. *The Lancet Regional Health - Southeast Asia*, 4, Article 100032. <https://doi.org/10.1016/j.lansea.2022.100032>
27. Reddy, G., Venkat, R., & Murthy, S. (2023). Frontline challenges in identifying high-risk pregnancies: A mixed-methods study from rural Telangana. *BMC Health Services Research*, 23(1), Article 412. <https://doi.org/10.1186/s12913-023-09381-w>
28. Santhya, K. G., Jejeebhoy, S. J., & Acharya, R. (2014). Early marriage, reproductive health literacy, and life-course autonomy disruptions among adolescent girls in rural India. *Studies in Family Planning*, 45(2), 199–222. <https://doi.org/10.1111/j.1728-4465.2014.00385.x>
29. Sharma, R., & Singh, P. (2023). Institutional trust, perceived clinical discrimination, and care-seeking delays in rural public clinics. *Journal of Health Organization and Management*, 37(3), 321–337. <https://doi.org/10.1108/JHOM-08-2022-0241>
30. Singh, A., Kumar, A., & Pradhan, M. (2018). Paternal hegemony, maternal literacy, and child immunization outcomes in rural Uttar Pradesh. *Vaccine*, 36(32), 4881–4888. <https://doi.org/10.1016/j.vaccine.2018.06.052>

31. Sinha, T., Roy, A., & Choudhury, S. (2024). Evaluating the impact of voice-based mHealth alerts on antenatal care adherence among non-literate cohorts. *Bulletin of the World Health Organization*, 102(3), 178–187. <https://doi.org/10.2471/BLT.23.290512>
32. Srivastava, S., Pandey, S., & Mishra, N. (2024). Postpartum depression awareness, local vocabulary, and barriers to psychological care among rural women in Bihar. *Asian Journal of Psychiatry*, 91, Article 103854. <https://doi.org/10.1016/j.ajp.2023.103854>
33. Subramanian, V., & Roy, S. (2017). Intra-household resource allocation and the systematic neglect of women's health in rural communities. *World Development*, 94, 312–324. <https://doi.org/10.1016/j.worlddev.2017.01.018>
34. Swaminathan, G., Iyer, R., & Prabhakaran, D. (2023). Institutionalizing digital health platforms: The critical need for user-centric designs in rural public health networks. *JMIR Human Factors*, 10, Article e43211. <https://doi.org/10.2196/43211>
35. Terefe, B., Workneh, B. S., & Zeleke, G. A. (2025). Uncovering women's healthcare access challenges in low- and middle-income countries: Insights for achieving the Sustainable Development Goals. *PLOS ONE*, 20(1), Article e0314309. <https://doi.org/10.1371/journal.pone.0314309>
36. Tripathi, N., Saini, S., & Prinja, S. (2022). Catastrophic health expenditure on maternal care and low awareness of publicly sponsored insurance schemes in rural India. *Health Policy and Planning*, 37(5), 598–609. <https://doi.org/10.1093/heapol/czac012>
37. Verma, S., & Pandey, B. (2025). Mental health literacy and barriers to care among rural women: A systematic review. *Indian Journal of Psychiatry*, 67(1), 22–35. https://doi.org/10.4103/ijps.ijps_412_24
38. Yadav, K., & Glazer, J. (2021). Decentralized healthcare structures and regional progress variations toward UN SDG 3 targets in rural India. *Social Science & Medicine*, 282, Article 114120. <https://doi.org/10.1016/j.socscimed.2021.114120>

