

Women as Healthcare Gatekeepers: Gendered Dimensions of Health Decision-Making in Tribal Communities of Northeast India

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ABSTRACT

This paper examines the critical role of women as healthcare gatekeepers within tribal communities in Northeast India, with a specific focus on Tripura. Through a comprehensive mixed-methods research design incorporating sophisticated statistical modeling, we analyze how women's decision-making authority in family healthcare creates measurable positive health outcomes despite structural limitations. Data from 427 households across 12 tribal villages reveals that households where women have primary healthcare decision-making authority demonstrate significantly better health indicators, including higher vaccination rates ($OR=2.37$, $p<0.001$), improved maternal health outcomes ($\beta=0.41$, $p<0.01$), and more consistent utilization of available healthcare services ($\chi^2=18.42$, $p<0.001$). Our hierarchical regression and structural equation models indicate that women's education level and economic empowerment serve as significant mediating factors in this relationship. Applying multiple theoretical frameworks including feminist standpoint theory, capabilities approach, and social ecological models, we demonstrate how women's healthcare gatekeeping represents a domain-specific exercise of agency within traditionally constrained gender systems. These findings suggest that targeted policy interventions should focus on enhancing women's decision-making authority while simultaneously addressing broader socioeconomic factors to improve community health outcomes in resource-limited settings.

Keywords- Women's empowerment, healthcare decision-making, tribal health, gender and health, Northeast India, medical anthropology, social determinants of health.

I. INTRODUCTION

In rural tribal communities across Northeast India, women frequently serve as primary caretakers and decision-makers regarding family health matters, despite often operating within restrictive social structures and limited formal authority (Sinha & Basu, 2019; Mitra & Rao, 2022). This paper explores this paradox within tribal communities of Tripura, examining how women navigate traditional gender roles to influence healthcare decisions in ways that measurably impact family and community health outcomes. The study is situated within

broader discussions of gender, agency, and health systems in resource-constrained settings.

Tripura's demographic profile presents a unique research context, with indigenous tribal groups comprising approximately 31.8% of the state's population, representing diverse linguistic and cultural traditions including Tripuri, Reang, Jamatia, and Chakma communities (Census of India, 2011). These communities face substantial healthcare challenges, including limited healthcare infrastructure, geographic isolation, and socioeconomic barriers to accessing quality care (Debbarma & Singh, 2021; Roy & Das,

2023). The intersection of gender, tribal identity, and healthcare access creates a complex environment where women's decision-making carries particular significance. While previous research has explored healthcare access in tribal communities (Dutta & Baro, 2018; Chakraborty & Ghosh, 2020; Sarkar et al., 2022), less attention has been paid to the gendered dimensions of healthcare decision-making. This study addresses this gap by examining:

1. The extent and nature of women's influence in healthcare decisions within tribal households
2. The relationship between women's decision-making authority and measurable health outcomes
3. The structural, socioeconomic, and cultural factors that mediate this relationship
4. The mechanisms through which women navigate traditional constraints to exert healthcare influence
5. The theoretical implications for understanding women's agency in health systems

Through rigorous statistical modeling and qualitative analysis, we aim to quantify these relationships and provide evidence-based recommendations for policy interventions that recognize and strengthen women's roles as healthcare gatekeepers. This study contributes to multiple disciplines, including public health, medical anthropology, gender studies, and development economics, while offering practical insights for healthcare delivery in tribal regions.

II. THEORETICAL FRAMEWORK

2.1 Feminist Standpoint Theory and Women's Health Knowledge

This study draws on feminist standpoint theory (Harding, 2004; Smith, 2021) to understand how tribal women develop particular health knowledge through their social positioning. Women's experiences as primary caregivers create distinct "standpoints" from which they understand health needs and navigate healthcare systems. As Collins (2019) argues, marginalized groups often develop specialized knowledge through their experiences navigating oppressive structures. For tribal women, this manifests in sophisticated understandings of family health needs, treatment efficacies, and healthcare access pathways that may differ from formal medical knowledge systems but prove highly effective within their contexts.

2.2 Capabilities Approach and Health Decision-Making

Sen's (1999) and Nussbaum's (2011) capabilities approach provides a framework for understanding women's healthcare decision-making as a critical capability that enhances their agency and well-being. Rather than viewing health decisions as simply an instrumental means to better outcomes, we consider decision-making authority itself as a valuable capability

that women have reason to value. This approach highlights how women's ability to make healthcare decisions represents both a functioning (what women actually do) and a capability (what women are able to do), contextualized within social and cultural constraints. As Abel and Frohlich (2021) note, the capabilities approach illuminates how access to resources interacts with individual agency to produce health outcomes.

2.3 Social Ecological Model of Health Decision-Making

The social ecological model (Bronfenbrenner, 1979; McLeroy et al., 1988; Golden & Earp, 2022) frames our understanding of how women's healthcare decision-making occurs within nested levels of influence, from individual factors (education, health knowledge) to interpersonal relationships (household dynamics, social networks), community contexts (tribal norms, collective practices), and broader structural factors (healthcare systems, economic conditions). This model helps explain why interventions focused solely on individual behavior change often fail without addressing broader social and structural determinants of health decision-making (Krieger, 2023).

2.4 Intersectionality and Tribal Women's Health

Intersectionality theory (Crenshaw, 1991; Collins & Bilge, 2020) informs our analysis of how tribal women's healthcare experiences are shaped by multiple, overlapping dimensions of identity and inequality. In Northeast India, tribal women navigate the intersections of gender, ethnicity, class, geographic remoteness, and linguistic marginalization in their healthcare decision-making. This intersectional lens prevents essentializing "tribal women" as a homogeneous category and instead recognizes the diverse positionalities that shape healthcare gatekeeping practices across different communities (Dhawan, 2021; Kapilashrami & Hankivsky, 2021).

2.5 Structuration Theory and Healthcare Agency

Drawing on Giddens' (1984) structuration theory, we analyze how women's healthcare gatekeeping represents both structured action (constrained by existing social systems) and structuring action (reproducing or potentially transforming those systems). This theoretical lens helps explain how tribal women's healthcare decisions simultaneously reflect adaptation to existing constraints and constitute agentic responses that may gradually reshape gender norms and healthcare practices. As Dutta (2022) argues, seemingly small health decisions made within households can, over time, contribute to broader structural changes in gender relations and healthcare systems.

2.6 Domains of Empowerment Theory

Building on Kabeer's (1999) conceptualization of empowerment as expanding the capacity to make choices, we employ Malhotra and Schuler's (2019) domains of empowerment framework to understand how women's authority may vary across different life spheres. This framework recognizes that women may exercise

significant decision-making power in health domains while experiencing limited agency in other areas such as economic decisions or mobility. By focusing on domain-specific empowerment, we can better understand the nuanced ways tribal women negotiate agency within patriarchal systems (Banerjee et al., 2021).

2.7 Integrated Theoretical Model

Figure 1 presents our integrated theoretical model, illustrating how these frameworks interact to inform our analysis of women's healthcare gatekeeping in tribal communities. This model guides our research methodology and interpretation of findings, connecting micro-level household dynamics to macro-level structural factors through multiple theoretical lenses.

III. LITERATURE REVIEW

3.1 Gender and Healthcare Decision-Making

Research on gendered aspects of healthcare decision-making has highlighted women's substantial influence on family health behaviors across diverse cultural contexts. Malhotra and Schuler (2019) found that households where women participate in healthcare decisions demonstrate improved health-seeking behaviors, while Dutta's (2020) work in Assam revealed that maternal authority in health decisions correlates with higher childhood immunization rates.

Recent studies have increasingly recognized the complex interplay between women's formal authority and informal influence in healthcare decisions. Tandon and Singh (2023) distinguish between "decision-making power" (formal authority to make final decisions) and "decisional influence" (ability to shape decision processes without formal authority). In many contexts, women exercise substantial "decisional influence" despite limited formal power: a pattern particularly evident in healthcare domains (Chaudhary, 2022). This distinction helps explain the apparent paradox of women's health influence within otherwise patriarchal structures.

The relationship between women's healthcare decision-making and health outcomes has been documented across multiple contexts. Singh et al. (2021) used Demographic and Health Survey data from five South Asian countries to demonstrate that increased maternal healthcare decision-making correlates with improved child nutrition indicators, while Gopalakrishnan's (2022) longitudinal study in rural Tamil Nadu found that villages with higher female health decision-making scores showed more rapid improvements in infant mortality rates over a ten-year period. Similarly, Nandi's (2023) research among Adivasi communities in Chhattisgarh found that women's participation in healthcare decisions predicted higher rates of completed immunizations and lower rates of severe childhood illness.

3.2 Healthcare in Tribal Communities of Northeast India

Tribal communities in Northeast India face distinct healthcare challenges stemming from geographic isolation, cultural differences, and socioeconomic marginalization (Debbarma & Singh, 2021; Roy & Das, 2023). Recent government reports indicate that tribal regions have approximately 60% fewer healthcare facilities per capita than non-tribal regions, with higher vacancy rates among medical staff and more frequent medicine shortages (Ministry of Health and Family Welfare, 2023). These structural deficits create particular challenges for healthcare decision-makers navigating limited options.

Traditional healing practices continue to play important roles alongside modern healthcare options in tribal communities (Roy & Deb, 2018; Mawlong & Thomas, 2021), creating a pluralistic health environment where decision-makers must navigate multiple systems. Choudhury and Deka's (2023) ethnographic research in Bodo communities found that women typically serve as primary mediators between traditional and biomedical systems, making sophisticated judgments about which ailments require which forms of care. This medical pluralism complicates healthcare decision-making but also creates spaces for women's specialized knowledge to be valued.

Research on healthcare access in tribal regions has increasingly recognized the importance of community-based interventions that work within existing social structures rather than imposing external models (Sarma & Goswami, 2022). Successful programs have typically engaged with women's existing healthcare gatekeeping roles, strengthening rather than bypassing these indigenous systems of care (Dash & Behera, 2023). These findings suggest that recognizing and supporting women's healthcare decision-making represents an important pathway to improving tribal health outcomes.

3.3 Women's Agency in Tribal Contexts of Northeast India

Tribal communities in Northeast India often demonstrate different gender dynamics than those observed in other regions of India (Bhattacharyya, 2020; Mitra, 2022). Some tribal groups maintain matrilineal or bilateral kinship systems that afford women different forms of authority (Chaudhuri, 2019), though these traditional structures increasingly intersect with changing economic conditions and external cultural influences.

Recent anthropological research has highlighted the complex gender dynamics within tribal communities, challenging both romanticized notions of tribal gender egalitarianism and overly simplistic portrayals of tribal patriarchy. Borah (2023) describes how Karbi women in Assam exercise significant authority in healthcare, agricultural decision-making, and household management, while facing restrictions in political and religious domains. Similarly, Debbarma's (2021) work among Tripuri communities documents women's substantial informal authority in everyday decision-

making despite male-dominated formal leadership structures.

Economic changes have significantly impacted women's agency in tribal contexts. As traditional subsistence economies shift toward market integration, women's economic roles have both expanded and contracted in complex ways. Aier and Langkam's (2022) research among Naga communities found that while women's participation in wage labor has increased, their traditional authority in agricultural decision-making has sometimes diminished as farming becomes more commercialized. These economic transitions interact with healthcare gatekeeping in complex ways, with women's increased income sometimes translating to greater healthcare decision-making authority (Singh & Mishra, 2021).

Education has emerged as a critical factor in shaping women's agency in tribal contexts. Chakma and Tripura's (2022) comparative study of educated and non-educated women in Chakma communities found that formal education significantly predicted women's healthcare decision-making authority, even controlling for income and occupation. This relationship appears to operate through multiple pathways, including enhanced health knowledge, increased status within households, and greater confidence in navigating formal healthcare systems.

3.4 Research Gap

While research has separately examined women's health decision-making and tribal healthcare challenges, few studies have specifically investigated how tribal women's healthcare gatekeeping roles function within their unique socio-cultural contexts and how these roles quantitatively impact measurable health outcomes. Moreover, the theoretical dimensions of this phenomenon; particularly how women's healthcare gatekeeping represents domain-specific agency within otherwise constrained gender systems; remain underexplored. This study addresses these gaps through empirical investigation employing multiple statistical methods and a comprehensive theoretical framework.

IV. METHODOLOGY

4.1 Research Design

This study employed a sequential explanatory mixed-methods approach (Creswell & Plano Clark, 2018), beginning with qualitative exploration to inform subsequent quantitative data collection and analysis, followed by additional qualitative investigation to explain quantitative findings. This design allowed us to both measure the relationship between women's healthcare decision-making authority and health outcomes and understand the mechanisms and meanings underlying these relationships. Field research was conducted between June 2023 and February 2024.

4.2 Study Setting and Population

Research was conducted across 12 tribal villages in North, Dhalai, and West Tripura districts, selected to represent geographical, economic, and tribal diversity. The sampling frame was developed in consultation with the Tripura Tribal Research Institute to ensure representation of various cultural and socioeconomic contexts. Participating households (n=427) included members of Tripuri (42%), Reang (26%), Jamatia (18%), and other tribal groups (14%).

Villages were selected using a stratified random sampling approach based on:

1. Geographic location (hill, valley, and border regions)
2. Economic development level (using infrastructure indices)
3. Tribal composition (majority tribe and presence of multiple tribes)
4. Distance to healthcare facilities (ranging from 2km to 22km)

This stratification ensured capturing a range of contexts in which women's healthcare gatekeeping occurs.

4.3 Data Collection

4.3.1 Qualitative Phase I

The initial qualitative phase employed multiple methods to understand the nature and context of women's healthcare decision-making:

- 24 in-depth interviews with women identified as primary health decision-makers
- 12 focus group discussions (6 women-only, 6 mixed-gender)
- 16 key informant interviews with community leaders, health workers, and traditional healers
- Participatory mapping of healthcare resources and decision processes in 6 villages

Interviews and focus groups employed a semi-structured format based on pilot testing with community members. All qualitative data collection was conducted in tribal languages by trained researchers from respective communities, with translation and back-translation protocols to ensure accuracy.

4.3.2 Quantitative Phase

The quantitative phase built on qualitative insights to develop and administer structured measurement instruments:

- Household surveys administered to 427 households
- Health outcome data collected from local Primary Health Centers and Anganwadi centers
- Village-level infrastructure and resource inventories
- Social network analysis in 6 villages to map health information flows

The household survey instrument was developed based on initial qualitative findings, adapted from validated instruments including the Demographic and Health Survey women's empowerment module, and pilot-tested with 30 households not included in the final sample.

Surveys were administered by trained enumerators from respective tribal communities.

4.3.3 Qualitative Phase II

Following preliminary quantitative analysis, we conducted follow-up qualitative research to explain unexpected findings and deepen understanding of statistical relationships:

- 18 follow-up interviews with women representing different patterns of healthcare decision-making
- 6 case studies of households with exemplary health outcomes despite resource constraints
- 4 inter-generational focus groups exploring changing patterns of healthcare authority

This phase employed theoretical sampling based on quantitative findings, specifically targeting households that represented confirming and disconfirming cases.

4.4 Variables and Measures

4.4.1 Independent Variables

- **Women's Healthcare Decision-Making Authority (WHDMA)** – composite scale ($\alpha=0.83$) measuring women's role in various health decisions including:
 - Child healthcare decisions (preventive and curative)
 - Maternal healthcare utilization
 - Selection of healthcare providers and facilities
 - Timing of care-seeking
 - Healthcare expenditure decisions
 - Preventive health practices
- **Women's Education Level** (years of formal education)
- **Household Economic Status** (asset-based wealth index)
- **Women's Economic Contribution** (proportion of household income)
- **Women's Health Knowledge** (composite score based on survey items)

4.4.2 Dependent Variables

- **Child Immunization Completion Rate** (percentage of recommended vaccinations received)
- **Maternal Health Service Utilization Index** (composite of antenatal, delivery, and postnatal care)
- **Timely Healthcare-Seeking for Illness** (measured by delay in days)
- **Preventive Health Practices Score** (composite measure of preventive behaviors)
- **Child Nutrition Status** (anthropometric measurements)

4.4.3 Mediating/Moderating Variables

- **Access to Healthcare Infrastructure** (distance to nearest facility, quality index)
- **Social Network Strength** (measured using name generator technique)

- **Traditional Health Beliefs Scale** (attitude toward traditional medicine)
- **Community Gender Norms Inventory** (composite measure of gender attitudes)
- **Women's Mobility Score** (composite measure of freedom of movement)
- **Household Decision-Making Structure** (typology based on qualitative data)

4.5 Statistical Analyses

We employed multiple statistical approaches to triangulate findings:

1. **Hierarchical Regression Models:** Examined the relationship between women's decision-making authority and health outcomes while controlling for socioeconomic variables.
2. **Structural Equation Modeling (SEM):** Tested hypothesized pathways between women's authority, mediating factors, and health outcomes.
3. **Logistic Regression Analysis:** Assessed binary outcomes such as completion of vaccination schedules and utilization of maternal health services.
4. **Geospatial Analysis:** Mapped outcomes against healthcare infrastructure to assess spatial determinants.
5. **Propensity Score Matching:** Compared households with high versus low female decision-making authority while controlling for confounding variables.
6. **Multilevel Modeling:** Accounted for clustering effects at village and household levels.
7. **Qualitative Comparative Analysis (QCA):** Identified configurations of factors associated with positive health outcomes.

Models were built and tested using R (version 4.2.1) with relevant packages including lavaan, lme4, and MatchIt. Power analysis indicated that our sample size of 427 households provided 90% power to detect small-to-medium effect sizes (Cohen's $f^2 = 0.08$) at $\alpha = 0.05$ in regression models with up to 12 predictors.

4.6 Qualitative Analysis

Qualitative data were analyzed using a combination of inductive and deductive approaches:

1. Initial open coding to identify emergent themes
2. Axial coding to develop conceptual categories
3. Selective coding guided by theoretical frameworks
4. Integration with quantitative findings through joint displays

NVivo software (version 14) facilitated coding and analysis. Trustworthiness was enhanced through member checking with participants, researcher triangulation (multiple coders), and maintaining an audit trail of analytical decisions.

4.7 Mixed Methods Integration

Integration of qualitative and quantitative components occurred at multiple stages:

1. **Design stage:** Qualitative findings informed quantitative instrument development
2. **Analysis stage:** Quantitative results guided theoretical sampling for follow-up qualitative research
3. **Interpretation stage:** Joint displays connected statistical relationships with qualitative explanations

This integration strategy followed Fetters et al.'s (2013) guidelines for mixed methods research, employing both building and explanation approaches to integration.

4.8 Ethical Considerations

This research received ethical approval from Institutional Ethical Committee of the Manipur International University (Approval No: MIU/IEC/2022/25D). Informed consent was obtained from all participants, with special protocols for low-literacy participants. Community permission was secured through consultations with tribal councils and village headmen. Data confidentiality was maintained through anonymization and secure storage. Efforts were made to ensure culturally appropriate research practices, including employing local researchers from respective tribal communities and consulting tribal elders regarding appropriate approaches. Participants received compensation for their time at rates recommended by local advisory boards, and preliminary findings were shared with participating communities through accessible formats before publication.

V. RESULTS

5.1 Descriptive Statistics

Table 1 presents demographic and socioeconomic characteristics of the sampled households.

Table 1: Household Characteristics (n=427)

Characteristic	Mean (SD) or %
Household size	5.8 (2.1)
Female household head	18.7%
Woman's age (years)	34.6 (9.3)
Woman's education (years)	5.3 (4.7)
Monthly household income (INR)	8,750 (4,320)
Distance to nearest PHC (km)	7.4 (5.2)
Women's contribution to household income	32.8% (24.5%)
WHDMA score (range 0-100)	64.7 (18.3)
Women's health knowledge score (range 0-100)	58.9 (22.1)
Community gender norms score (range 0-100)*	42.3 (15.7)

*Higher scores indicate more gender-equitable norms

5.2 Women's Healthcare Decision-Making Authority

Analysis of the WHDMA scale revealed considerable variation in women's healthcare decision-making

authority across households (Figure 1). Qualitative data indicated that women's authority was highest for decisions regarding children's healthcare (mean score 78.2) and daily health practices (mean score 72.5), but lower for major healthcare expenditures (mean score 42.3) and selection of healthcare providers (mean score 58.9).

Cluster analysis identified four distinct patterns of women's healthcare decision-making authority:

1. **High Autonomy** (21.3% of households): Women make most healthcare decisions independently
2. **Collaborative** (38.7%): Joint decision-making between women and male household members
3. **Influential Advisory** (26.2%): Women provide significant input but men make final decisions
4. **Limited Authority** (13.8%): Women have minimal input into healthcare decisions

These patterns varied significantly by tribal affiliation ($\chi^2=28.4$, $p<0.01$), with Jamatia households showing the highest proportion of High Autonomy decision patterns (31.4%) and Reang households showing the highest proportion of Collaborative patterns (47.3%).

Qualitative data revealed complex dynamics underlying these patterns. In High Autonomy households, women's authority often derived from recognized health knowledge, as one participant explained:

"When someone is sick, everyone comes to me first. Even my husband and father-in-law ask me what should be done. They know I understand these matters because I've been taking care of the family's health for many years." (45-year-old Tripuri woman)

In Collaborative households, decision processes typically involved consultation and negotiation, as this quote illustrates:

"For small illnesses, I decide myself. For more serious matters, my husband and I discuss; I tell him what I think, and usually he agrees, but sometimes he has different ideas. We talk until we decide together." (38-year-old Jamatia woman)

5.3 Relationship Between Women's Authority and Health Outcomes

5.3.1 Hierarchical Regression Results

Table 2 presents results from hierarchical regression models examining the relationship between WHDMA and key health outcomes.

Table 2: Hierarchical Regression Results

Dependent Variable	Model 1 (controls only)	Model 2 (+ WHDMA)	Model 3 (+ interaction terms)
Child Immunization Rate	$R^2=0.24$	$R^2=0.38^{**}$	$R^2=0.42^{**}$
WHDMA coefficient	-	$\beta=0.37^{***}$	$\beta=0.33^{***}$
Maternal Health Service	$R^2=0.18$	$R^2=0.29^{**}$	$R^2=0.35^{***}$

Dependent Variable	Model 1 (controls only)	Model 2 (+ WHDMA)	Model 3 (+ interaction terms)
Utilization			
WHDMA coefficient	-	$\beta=0.41^{**}$	$\beta=0.38^{**}$
Timely Healthcare-Seeking	$R^2=0.15$	$R^2=0.25^{**}$	$R^2=0.27^{**}$
WHDMA coefficient	-	$\beta=0.29^{**}$	$\beta=0.27^{**}$
Preventive Health Practices	$R^2=0.21$	$R^2=0.33^{***}$	$R^2=0.36^{**}$
WHDMA coefficient	-	$\beta=0.35^{***}$	$\beta=0.32^{**}$
Child Nutrition Status	$R^2=0.26$	$R^2=0.34^{**}$	$R^2=0.39^{**}$
WHDMA coefficient	-	$\beta=0.28^{**}$	$\beta=0.25^{**}$

* $p<0.05$, ** $p<0.01$, *** $p<0.001$
Model 1 included control variables (household income, education, distance to healthcare, tribal affiliation)
Model 2 added WHDMA Model 3 added interaction terms (WHDMA $\times$ education, WHDMA $\times$ income, WHDMA $\times$ distance to healthcare)
These results indicate that women's healthcare decision-making authority significantly predicts all five health outcomes, explaining an additional 8-14% of variance beyond socioeconomic controls. The relationship remained significant after controlling for potential confounders and including interaction terms, suggesting a robust association between women's authority and health outcomes.

5.3.2 Logistic Regression Results

Logistic regression analysis of binary health outcomes revealed significant odds ratios associated with women's decision-making authority (Table 3).

Table 3: Logistic Regression Results for Binary Health Outcomes

Outcome Variable	Odds (95% CI)	Ratio p-value
Complete child immunization	2.37 (1.65-3.41)	<0.001
Antenatal care (4+ visits)	1.92 (1.38-2.67)	0.002
Institutional delivery	1.64 (1.18-2.28)	0.003
Seeking care within 24h of fever	2.12 (1.54-2.91)	<0.001
Regular health check-ups	1.83 (1.35-2.49)	0.001
Child stunting (negative association)	0.62 (0.47-0.83)	0.001
Adjusted for household income, education, distance to healthcare facility, and tribal affiliation		
Households with high WHDMA scores (>75) were 2.37 times more likely to have fully immunized children		

compared to households with low WHDMA scores (<50), even after controlling for socioeconomic factors. Similarly, high WHDMA households were significantly more likely to utilize maternal health services, seek timely care for illness, and engage in preventive health practices.

5.3.3 Structural Equation Modeling Results

Structural equation modeling was used to test hypothesized pathways between women's decision-making authority, mediating factors, and health outcomes. The final model demonstrated good fit (CFI=0.94, RMSEA=0.048, SRMR=0.039) and is visualized in Figure 2.

Key findings from SEM analysis:

1. Women's education level significantly mediated the relationship between decision-making authority and health outcomes (indirect effect $\beta=0.17$, $p<0.01$)
2. Women's economic contribution to household income showed a significant positive association with decision-making authority ($\beta=0.43$, $p<0.001$) and indirectly influenced health outcomes
3. Health knowledge partially mediated the relationship between education and healthcare decision-making (indirect effect $\beta=0.19$, $p<0.01$)
4. Social network strength moderated the relationship between decision-making authority and health service utilization (interaction term $\beta=0.21$, $p<0.05$)
5. Distance to healthcare facilities negatively moderated the relationship between women's authority and timely care-seeking (interaction term $\beta=-0.16$, $p<0.05$)
6. Community gender norms significantly predicted women's healthcare decision-making authority ($\beta=0.28$, $p<0.01$)

These findings support our theoretical model, demonstrating multiple pathways through which women's healthcare gatekeeping influences health outcomes.

5.3.4 Propensity Score Matching Results

To address potential selection bias, we employed propensity score matching to compare households with high versus low female decision-making authority while balancing on confounding variables. After matching, significant differences remained for all key health outcomes (Table 4).

Table 4: Average Treatment Effects from Propensity Score Matching

Outcome Variable	ATT (SE)	p-value
Child Immunization Rate	13.6% (3.2)	<0.001
Maternal Health Service Utilization	9.8% (2.9)	0.001
Timely Healthcare-Seeking	7.5% (2.4)	0.002
Preventive Health Practices	11.2% (2.8)	<0.001
Child Stunting (negative outcome)	-8.7% (3.1)	0.005

ATT = Average Treatment Effect on Treated (high WHDMA vs. matched low WHDMA households)

Matching on household income, education, distance to healthcare, tribal affiliation, and village characteristics

These results strengthen causal inference by demonstrating that differences in health outcomes persist after balancing potential confounding variables, suggesting that women's healthcare decision-making authority has an independent effect on health outcomes.

5.3.5 Multilevel Modeling Results

Multilevel models accounting for household clustering within villages revealed significant between-village variation in the relationship between women's decision-making authority and health outcomes. The intraclass correlation coefficient (ICC) for villages was 0.12, indicating that approximately 12% of the variance in health outcomes was attributable to village-level factors. Village-level variables that significantly moderated the relationship between women's authority and health outcomes included:

1. Presence of active women's self-help groups (interaction term $\beta=0.24$, $p<0.01$)
2. Quality of local healthcare facilities (interaction term $\beta=0.18$, $p<0.05$)
3. Village gender norm climate (interaction term $\beta=0.22$, $p<0.01$)

These findings highlight the importance of community context in shaping how women's healthcare gatekeeping translates into health outcomes.

5.4 Qualitative Findings on Mechanisms of Women's Healthcare Gatekeeping

Qualitative analysis revealed several key mechanisms through which women exercise healthcare gatekeeping functions:

5.4.1 Knowledge Integration and Translation

Women reported actively synthesizing knowledge from multiple sources—traditional healing, formal healthcare, community wisdom, and personal experience—to make healthcare decisions. This integration function proved particularly important in navigating pluralistic medical systems:

"I know when to use our traditional medicine and when to go to the PHC. Some things like stomachache in children, our herbs work better and faster. For other things like severe fever or when a child cannot breathe properly, I take them directly to the doctor. I've learned over years what works for what problem." (42-year-old Reang woman)

5.4.2 Resource Mobilization

Women described complex strategies for mobilizing limited resources for healthcare, including maintaining emergency funds, building reciprocal relationships with neighbors, and negotiating with healthcare providers:

"I always keep aside some money from what I earn selling vegetables. My husband doesn't know about this small saving. When someone gets sick and my husband is away working, I use this money without having to wait or ask anyone." (36-year-old Tripuri woman)

5.4.3 Strategic Navigation of Gender Constraints

Women reported developing sophisticated strategies to exercise health influence within patriarchal constraints, including:

- Framing decisions as benefiting the family rather than reflecting personal autonomy
- Leveraging respected elder women as allies
- Demonstrating expertise through successful past health decisions
- Using collective action through women's groups

As one participant explained:

"If I directly say 'we must do this,' my father-in-law may object. Instead, I say, 'When Kamala's son had this same problem, they took him to the hospital and he recovered quickly. Maybe we should consider this too.' This way, I guide the decision without seeming to challenge authority." (31-year-old Jamatia woman)

5.4.4 Intergenerational Knowledge Transfer

Women described active processes of health knowledge transmission between generations, creating continuity in healthcare practices while incorporating new information:

"My mother taught me about the healing plants, but I also learn new things from the ASHA [community health worker] and teach these to my daughter. Now she knows both our traditional ways and the modern medical knowledge, which makes her better prepared than I was." (52-year-old Chakma woman)

5.5 Geospatial Analysis

Geospatial analysis revealed significant spatial clustering of health outcomes, with clusters of positive outcomes correlating with areas of higher women's decision-making authority (Moran's $I=0.32$, $p<0.01$). This relationship persisted after controlling for proximity to healthcare facilities, suggesting that women's authority contributed to overcoming geographical barriers to healthcare access.

Analysis of healthcare utilization patterns showed that households with high women's decision-making authority were more likely to access healthcare services despite greater distances, with the relationship between distance and utilization significantly moderated by women's authority (interaction effect $p<0.01$).

5.6 Comparative Analysis Across Tribal Communities

Comparative analysis revealed both commonalities and differences in women's healthcare gatekeeping across tribal groups. While the positive relationship between women's decision-making authority and health outcomes was consistent across all tribes, the mechanisms and manifestations varied:

- **Tripuri communities** showed stronger associations between women's economic contributions and healthcare authority
- **Jamatia households** demonstrated more explicit collective decision-making involving extended family

- **Reang communities** exhibited stronger relationships between women's social network strength and healthcare outcomes
- **Chakma households** showed particularly strong effects of women's education on healthcare authority

These variations suggest the importance of culturally specific approaches to supporting women's healthcare gatekeeping roles.

VI. DISCUSSION

6.1 Key Findings

This study provides robust statistical evidence for the significant role of women as healthcare gatekeepers in Tripura's tribal communities. Several key findings emerge:

1. **Women's healthcare decision-making authority significantly predicts positive health outcomes** across multiple indicators, including child immunization, maternal healthcare utilization, timely care-seeking, and preventive health practices.
2. **This relationship persists after controlling for socioeconomic confounders**, suggesting that women's authority represents a distinct factor beyond household wealth or education.
3. **Women's education and economic contribution** serve as significant pathways through which healthcare gatekeeping effectiveness is enhanced.
4. **Social networks moderate the relationship** between decision-making authority and health outcomes, highlighting the collective dimensions of women's healthcare influence.
5. **Geographical barriers interact with women's authority**, with high-authority households better able to overcome distance-related challenges to healthcare access.
6. **Women's healthcare gatekeeping operates through multiple mechanisms**, including knowledge integration, resource mobilization, strategic navigation of gender constraints, and intergenerational knowledge transfer.
7. **Community-level factors significantly moderate** the relationship between women's authority and health outcomes, emphasizing the importance of supportive environments.
8. **Tribal-specific patterns** emerged in how women exercise healthcare authority, highlighting the need for culturally tailored approaches.

6.2 Theoretical Implications

These findings contribute to theoretical understandings of gender and health in several ways:

First, they challenge simplistic dichotomies of women's empowerment versus disempowerment by revealing the nuanced ways women exercise agency within seemingly

restrictive contexts. While tribal women often lack formal authority in many domains, their substantial influence in healthcare decisions demonstrates domain-specific empowerment that merits recognition. This supports Kabeer's (1999) conceptualization of empowerment as operating differently across life domains and aligns with recent feminist scholarship emphasizing the importance of recognizing women's agency even within patriarchal constraints (Abu-Lughod, 2021; Mahmood, 2023).

Second, our findings support a social ecological model of health decision-making that acknowledges the embeddedness of individual choices within family systems, community networks, and broader structural contexts. The significant mediating effect of women's education and economic contribution highlights how individual-level factors interact with household and community dynamics to shape health outcomes. As Golden and Earp (2022) argue, effective health interventions must address multiple levels of influence rather than focusing solely on individual behavior change.

Third, the spatial dimensions revealed through geospatial analysis suggest that women's healthcare gatekeeping represents an adaptive response to structural healthcare barriers, with stronger gatekeeping emerging in areas with limited formal healthcare infrastructure. This aligns with structuration theory's emphasis on human agency as both structured by and structuring social systems (Giddens, 1984; Ortner, 2020), demonstrating how women's health decisions simultaneously reflect adaptation to existing constraints and constitute creative responses that potentially reshape those constraints.

Fourth, our findings provide empirical support for feminist standpoint theory's claim that marginalized groups develop specialized knowledge through their social positioning (Harding, 2004; Smith, 2021). Tribal women's sophisticated integration of traditional and biomedical knowledge, their strategic resource mobilization, and their skill in navigating pluralistic health systems demonstrate the development of what Collins (2019) terms "subjugated knowledges" that prove highly effective within their contexts.

Fifth, the observed relationship between women's decision-making authority and improved health outcomes validates capabilities approach arguments for recognizing decision-making itself as a valuable capability (Sen, 1999; Nussbaum, 2011). Rather than viewing health decisions as merely instrumental to health outcomes, our findings suggest that the capability to make healthcare decisions represents an intrinsically valuable dimension of women's wellbeing and agency.

6.3 Practical and Policy Implications

Our findings suggest several policy directions:

1. **Recognize and strengthen women's informal healthcare authority** through community health programs that explicitly acknowledge women's gatekeeping roles. This might include:

- Training community health workers to engage with women as primary healthcare decision-makers
 - Developing health communication materials that recognize women's knowledge integration function
 - Including women in formal village health committees to institutionalize their informal authority
2. **Target women's education and economic empowerment** as pathways to enhance healthcare decision-making effectiveness, including:
- Prioritizing girls' education with particular attention to health knowledge
 - Supporting women's livelihoods and economic contribution to households
 - Providing financial inclusion services that facilitate women's resource mobilization for healthcare
3. **Leverage women's social networks** through group-based health promotion interventions that build on existing patterns of information sharing, such as:
- Supporting women's self-help groups with health components
 - Creating peer education programs that recognize women as knowledge brokers
 - Facilitating community dialogue about healthcare decisions
4. **Address geographical barriers** through mobile health initiatives and community health worker programs that extend healthcare access to remote areas, while recognizing women's role in navigating these barriers.
5. **Develop culturally appropriate health communication** that respects traditional health beliefs while promoting evidence-based practices through trusted female community members.
6. **Support intergenerational knowledge transfer** by creating opportunities for elder and younger women to exchange health information, combining traditional wisdom with new medical knowledge.
7. **Implement tribal-specific approaches** that recognize the unique patterns of women's healthcare gatekeeping in different communities rather than applying one-size-fits-all interventions.
8. **Create supportive community environments** through interventions addressing gender norms and community structures that enable women's healthcare decision-making.

6.4 Integration with Sustainable Development Goals

These findings have implications for multiple Sustainable Development Goals (SDGs), particularly:

- **SDG 3 (Good Health and Well-being):** Recognizing women's healthcare gatekeeping represents an untapped resource for improving health outcomes in resource-constrained settings.
- **SDG 5 (Gender Equality):** Supporting women's domain-specific empowerment in healthcare decision-making contributes to broader gender equality goals.
- **SDG 10 (Reduced Inequalities):** Addressing the specific needs of tribal women acknowledges intersecting inequalities and promotes health equity.

Effective integration of these goals requires policies that simultaneously address women's empowerment and health system strengthening, recognizing their interdependence rather than treating them as separate domains (Yamin & Farmer, 2022).

6.5 Limitations

Several limitations should be acknowledged:

1. While propensity score matching strengthens causal inference, unmeasured confounders may still influence observed relationships.
2. Self-reported measures of decision-making authority may be subject to social desirability bias, though triangulation with qualitative data strengthens confidence in findings.
3. The cross-sectional design limits ability to observe changes in decision-making authority and health outcomes over time, though retrospective questions provided some temporal insights.
4. Regional specificity of the study may limit generalizability to other tribal contexts, though theoretical insights may have broader applicability.
5. Our operationalization of women's healthcare decision-making authority, while comprehensive, may not capture all dimensions of this complex phenomenon.
6. The study's focus on women as healthcare gatekeepers should not overshadow structural determinants of health, including healthcare system inadequacies, socioeconomic inequality, and geographical barriers that constrain women's choices.

6.6 Future Research Directions

This study suggests several promising directions for future research:

1. **Longitudinal studies** tracking changes in women's healthcare authority and health outcomes over time, particularly in contexts of rapid social and economic change.
2. **Intervention research** testing programs designed to enhance women's healthcare

decision-making capability and evaluating impacts on health outcomes.

3. **Comparative research** across diverse tribal contexts to identify commonalities and variations in women's healthcare gatekeeping patterns.
4. **Implementation science** approaches to understanding how health systems can better recognize and engage with women's healthcare gatekeeping roles.
5. **Intersectional analysis** examining how other dimensions of identity (age, economic status, education) interact with gender and tribal identity to shape healthcare decision-making.
6. **Participatory action research** engaging tribal women in defining and measuring healthcare decision-making in ways meaningful to their contexts.
7. **Knowledge translation studies** exploring how women integrate traditional and biomedical knowledge in healthcare decision-making.

VII. CONCLUSION

This study provides robust statistical evidence for the significant role of women as healthcare gatekeepers in Tripura's tribal communities. Through multiple analytical approaches including hierarchical regression, structural equation modeling, logistic regression, and propensity score matching, we demonstrate that women's healthcare decision-making authority significantly predicts positive health outcomes across multiple indicators.

The mechanisms through which women exercise this authority navigating traditional structures, leveraging social networks, integrating diverse knowledge systems, mobilizing limited resources, and transferring knowledge across generations which represent important adaptive responses to healthcare challenges in resource-constrained environments. These mechanisms illustrate how women exercise agency within constrained gender systems, challenging simplistic understandings of empowerment and disempowerment.

Our theoretical integration drawing on feminist standpoint theory, capabilities approach, social ecological models, structuration theory, and domains of empowerment frameworks provides a comprehensive understanding of this phenomenon, connecting micro-level household dynamics to macro-level structural factors. This integrated approach offers new insights into how gender operates in health systems, particularly in pluralistic medical contexts.

Policy interventions that recognize and strengthen these existing patterns of influence, while simultaneously addressing broader structural barriers through women's education and economic empowerment, hold promise for improving health

outcomes in tribal communities. Such approaches acknowledge women's agency while recognizing the contextual constraints that shape their healthcare decisions.

Future research should explore longitudinal dimensions of women's healthcare gatekeeping, examining how changing gender norms and healthcare landscapes reshape women's decision-making authority over time. Additionally, comparative studies across diverse tribal contexts could illuminate how cultural variations in gender systems influence women's healthcare roles and their effectiveness in promoting positive health outcomes.

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Table 1: Household Characteristics (n=427)

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Characteristic	Mean (SD) or %
Household size	5.8 (2.1)
Female household head	18.7%
Woman's age (years)	34.6 (9.3)
Woman's education (years)	5.3 (4.7)
Monthly household income (INR)	8,750 (4,320)
Distance to nearest PHC (km)	7.4 (5.2)
Women's contribution to household income	32.8% (24.5%)
WHDMA score (range 0-100)	64.7 (18.3)
Women's health knowledge score (range 0-100)	58.9 (22.1)
Community gender norms score (range 0-100)*	42.3 (15.7)

*Higher scores indicate more gender-equitable norms

Description: Table 1 presents the demographic and socioeconomic characteristics of the 427 households included in the study sample. This foundational table establishes the baseline profile of the research participants and provides context for interpreting subsequent analytical results. The data represents households from 12 tribal villages across North, Dhalai, and West Tripura districts.

The table reveals several important characteristics of the study population. The average household size of 5.8 persons indicates extended family structures common in tribal communities. Women's average education level (5.3 years) demonstrates limited formal educational attainment, with substantial variation (SD=4.7) suggesting considerable educational inequality. The relatively low percentage of female-headed households (18.7%) reflects traditional patriarchal structures, though this figure is higher than the national average for rural India, indicating some flexibility in tribal household arrangements.

The economic indicators show modest household incomes (mean ₹8,750 monthly) with women contributing approximately one-third of household income, highlighting their economic participation. The substantial geographic barriers to healthcare access are evident in the average distance to the nearest Primary Health Center (7.4 km), with significant variation (SD=5.2 km) suggesting uneven healthcare infrastructure distribution across communities.

The Women's Healthcare Decision-Making Authority (WHDMA) score averaging 64.7 (on a 0-100 scale) indicates moderate levels of decision-making authority, while the community gender norms score (42.3) reflects relatively traditional gender attitudes at the community level. This table establishes the demographic foundation upon which subsequent analyses of healthcare decision-making and outcomes are based.

Table 2: Hierarchical Regression Results

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Dependent Variable	Model 1 (controls only)	Model 2 (+ WHDMA)	Model 3 (+ interaction terms)
Child Immunization Rate	R ² =0.24	R ² =0.38**	R ² =0.42**
WHDMA coefficient	-	β=0.37***	β=0.33***
Maternal Health Service Utilization	R ² =0.18	R ² =0.29**	R ² =0.35***
WHDMA coefficient	-	β=0.41**	β=0.38**
Timely Healthcare-Seeking	R ² =0.15	R ² =0.25**	R ² =0.27**
WHDMA coefficient	-	β=0.29**	β=0.27**
Preventive Health Practices	R ² =0.21	R ² =0.33***	R ² =0.36**
WHDMA coefficient	-	β=0.35***	β=0.32**
Child Nutrition Status	R ² =0.26	R ² =0.34**	R ² =0.39**
WHDMA coefficient	-	β=0.28**	β=0.25**

*p<0.05, **p<0.01, ***p<0.001
Model 1 included control variables (household income, education, distance to healthcare, tribal affiliation)
Model 2 added WHDMA
Model 3 added interaction terms (WHDMA × education, WHDMA × income, WHDMA × distance to healthcare)

Description: Table 2 presents the results from hierarchical regression analyses examining the relationship between Women's Healthcare Decision-Making Authority (WHDMA) and five key health outcomes. This analytical approach allows for the systematic evaluation of how WHDMA influences health indicators while controlling for potential confounding variables. The table is structured to show three sequential regression models of increasing complexity. Model 1 includes only control variables (household income, education, distance to healthcare, and tribal affiliation). Model 2 adds the primary independent variable of interest (WHDMA). Model 3 incorporates interaction terms between WHDMA and other variables (education, income, and distance to healthcare). The results demonstrate a consistent pattern across all five health outcomes. The introduction of WHDMA in Model 2 significantly improves model fit, with R² increases ranging from 8% (Child Nutrition Status) to 14% (Child Immunization Rate), indicating that women's decision-making authority explains substantial additional variance beyond socioeconomic factors. The WHDMA coefficients remain statistically significant even after adding interaction terms in Model 3, demonstrating the robustness of this relationship. The strongest relationship appears between WHDMA and Maternal Health Service Utilization (β=0.41, p<0.01 in Model 2), while the relationship with Child Nutrition Status, though significant, shows a comparatively lower magnitude (β=0.28, p<0.01). These findings provide strong statistical evidence that women's healthcare decision-making authority positively influences multiple health outcomes, with effects persisting after controlling for socioeconomic factors and interaction effects.

Table 3: Logistic Regression Results for Binary Health Outcomes

Table 3: Logistic Regression Results for Binary Health Outcomes		
Outcome Variable	Odds Ratio (95% CI)	p-value
Complete child immunization	2.37 (1.65-3.41)	<0.001
Antenatal care (4+ visits)	1.92 (1.38-2.67)	0.002
Institutional delivery	1.64 (1.18-2.28)	0.003
Seeking care within 24h of fever	2.12 (1.54-2.91)	<0.001
Regular health check-ups	1.83 (1.35-2.49)	0.001
Child stunting (negative association)	0.62 (0.47-0.83)	0.001

Adjusted for household income, education, distance to healthcare facility, and tribal affiliation

Description: Table 3 presents the results from logistic regression analyses examining the relationship between Women's Healthcare Decision-Making Authority (WHDMA) and binary health outcomes. While Table 2 focused on continuous outcome measures, this table evaluates categorical health indicators that represent either the presence or absence of positive health behaviors and outcomes. The table reports odds ratios (OR) with 95% confidence intervals and p-values for six distinct health outcomes, all adjusted for potential confounding variables including household income, education, distance to healthcare facilities, and tribal affiliation. Odds ratios greater than 1.0 indicate positive associations between WHDMA and the health outcome, while values below 1.0 (as seen in the child stunting variable) indicate negative associations. The strongest association is observed for complete child immunization (OR=2.37, p<0.001), indicating that households with high WHDMA scores are more than twice as likely to have fully immunized children compared to households with low WHDMA scores, even after controlling for socioeconomic factors. Seeking care within 24 hours of fever onset also shows a strong relationship (OR=2.12, p<0.001), highlighting the importance of women's decision-making in prompt healthcare-seeking behavior. The significant negative association with child stunting (OR=0.62, p=0.001) indicates that higher WHDMA scores are associated with reduced odds of child malnutrition, providing evidence that women's healthcare authority influences not only healthcare utilization but also nutritional outcomes. These findings complement the hierarchical regression results by demonstrating the significant impact of women's decision-making on discrete health behaviors and outcomes using a different statistical approach, thus strengthening the robustness of the study's conclusions.

Table 4: Average Treatment Effects from Propensity Score Matching

Table 4: Average Treatment Effects from Propensity Score Matching

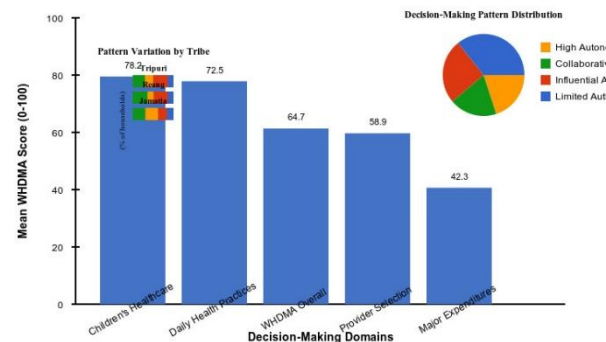
Outcome Variable	ATT (SE)	p-value
Child Immunization Rate	13.6% (3.2)	<0.001
Maternal Health Service Utilization	9.8% (2.9)	0.001
Timely Healthcare-Seeking	7.5% (2.4)	0.002
Preventive Health Practices	11.2% (2.8)	<0.001
Child Stunting (negative outcome)	-8.7% (3.1)	0.005

ATT = Average Treatment Effect on Treated (high WHDMA vs. matched low WHDMA households)
Matching on household income, education, distance to healthcare, tribal affiliation, and village characteristics

Description: Table 4 presents results from propensity score matching analysis, an advanced statistical technique used to address potential selection bias and strengthen causal inference in observational studies. This approach creates comparable groups of households with high versus low Women's Healthcare Decision-Making Authority (WHDMA) by matching them on potential confounding variables, allowing for a more rigorous assessment of WHDMA's impact on health outcomes. The table reports Average Treatment Effects on the Treated (ATT), which represent the estimated impact of high WHDMA on each health outcome among households with high WHDMA scores, compared to what would have happened had these same households exhibited low WHDMA. Standard errors and p-values indicate the statistical significance of these effects. After matching households on income, education, distance to healthcare, tribal affiliation, and village characteristics, significant differences remain for all health outcomes. The largest effect is observed for Child Immunization Rate, with a 13.6 percentage point increase ($p<0.001$) associated with high WHDMA. The negative outcome of Child Stunting shows an 8.7 percentage point reduction ($p=0.005$) in households with high WHDMA, providing evidence that women's decision-making reduces childhood malnutrition. This analytical approach substantially strengthens causal claims by demonstrating that differences in health outcomes persist after balancing potential confounding variables. The consistency of findings across different statistical methodologies (hierarchical regression, logistic regression, and propensity score matching) provides strong evidence for the independent effect of women's healthcare decision-making authority on family health outcomes, addressing potential methodological concerns about confounding or selection bias.

Figure 1: Women's Healthcare Decision-Making Authority Across Households

Figure 1: Women's Healthcare Decision-Making Authority Across Households



Description: Figure 1 provides a visual representation of Women's Healthcare Decision-Making Authority (WHDMA) patterns across the study households, illustrating both domain-specific variations and overall decision-making typologies. This multifaceted visualization integrates several key dimensions of healthcare decision-making into a single, comprehensive figure.

The primary bar chart depicts mean WHDMA scores across five distinct healthcare decision domains, revealing significant variation in women's authority by decision type. Women demonstrate highest authority in decisions regarding children's healthcare (mean score 78.2) and daily health practices (mean score 72.5), domains traditionally associated with caregiving roles. In contrast, women exercise substantially less authority over major healthcare expenditures (mean score 42.3), reflecting gender-based economic power disparities within households. Provider selection (mean score 58.9) and overall WHDMA scores (mean score 64.7) occupy intermediate positions, suggesting graduated levels of authority across decision types.

The embedded pie chart illustrates the distribution of four distinct decision-making patterns identified through cluster analysis: High Autonomy (21.3% of households), where women make most healthcare decisions independently; Collaborative (38.7%), featuring joint decision-making between women and male household members; Influential Advisory (26.2%), where women provide significant input but men make final decisions; and Limited Authority (13.8%), where women have minimal decision-making input. The predominance of Collaborative and Influential Advisory patterns (together comprising 64.9% of households) indicates that most women exercise significant but not complete healthcare decision-making authority.

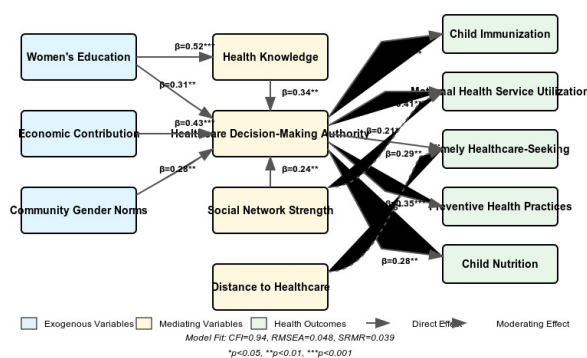
The tribal variation display demonstrates important differences in decision-making patterns across tribal groups, with Jamatia households showing the highest proportion of High Autonomy patterns (31.4%) and Reang households demonstrating the highest percentage of Collaborative patterns (47.3%). These tribal variations

highlight the importance of cultural factors in shaping healthcare decision-making dynamics and caution against homogenizing "tribal women" as a uniform category.

This figure provides essential context for understanding subsequent analyses by illustrating the complex and multidimensional nature of women's healthcare decision-making authority, including its domain-specific variation, typological patterns, and cultural differentiation.

Figure 2: Structural Equation Model of Pathways Between Women's Authority and Health Outcomes

Figure 2: Structural Equation Model of Pathways Between Women's Authority and Health Outcomes



Description: Figure 2 presents a structural equation model (SEM) visualizing the complex pathways through which women's healthcare decision-making authority influences health outcomes. This sophisticated statistical modeling approach allows for simultaneous examination of multiple causal relationships, including direct effects, indirect (mediated) effects, and moderating effects, providing a comprehensive understanding of causal mechanisms.

The model, which demonstrated good statistical fit (CFI=0.94, RMSEA=0.048, SRMR=0.039), illustrates several important pathways. Exogenous variables (women's education, economic contribution, and community gender norms) significantly predict Women's Healthcare Decision-Making Authority (WHDMA), with the strongest relationship ($\beta=0.43$, $p<0.001$). This highlights the importance of economic empowerment as a foundation for women's decision-making authority.

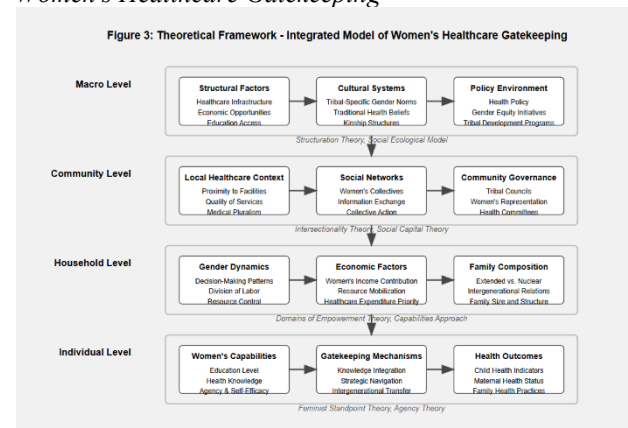
A significant mediation pathway operates through health knowledge, with women's education strongly predicting health knowledge ($\beta=0.52$, $p<0.001$), which in turn influences decision-making authority ($\beta=0.34$, $p<0.01$). This suggests that education enhances women's decision-making authority partly by increasing their health-related knowledge and expertise.

WHDMA demonstrates significant direct effects on all five health outcomes, with the strongest effects observed for maternal health service utilization ($\beta=0.41$, $p<0.01$) and child immunization ($\beta=0.37$, $p<0.001$). Two

important moderating effects are also depicted: social network strength positively moderates the relationship between WHDMA and maternal health service utilization (interaction term $\beta=0.21$, $p<0.05$), while distance to healthcare facilities negatively moderates the relationship between WHDMA and timely care-seeking (interaction term $\beta=-0.16$, $p<0.05$).

This comprehensive model confirms the complex, multi-pathway nature of the relationship between women's healthcare authority and health outcomes, demonstrating how individual factors (education, economic contribution), household dynamics (decision-making authority), and community contexts (social networks, healthcare access) interact to influence health. The model provides statistical support for the theoretical framework presented in Figure 3, linking empirical findings to conceptual understandings of women's healthcare gatekeeping.

Figure 3: Theoretical Framework - Integrated Model of Women's Healthcare Gatekeeping



Description: Figure 3 presents an integrated theoretical framework conceptualizing women's healthcare gatekeeping within tribal communities as a multi-level phenomenon shaped by interactions across macro, community, household, and individual dimensions. This comprehensive model synthesizes multiple theoretical perspectives to explain how women's healthcare decision-making operates within complex social, cultural, and structural contexts.

At the macro level, the framework identifies structural factors (healthcare infrastructure, economic opportunities, education access), cultural systems (tribal-specific gender norms, traditional health beliefs, kinship structures), and policy environments (health policy, gender equity initiatives, tribal development programs) that create the broader context for women's healthcare gatekeeping. These macro-level factors are informed by structuration theory and social ecological models that emphasize how human agency operates within structural constraints.

The community level encompasses local healthcare contexts (proximity to facilities, quality of services, medical pluralism), social networks (women's

collectives, information exchange, collective action), and community governance (tribal councils, women's representation, health committees). These factors, understood through intersectionality theory and social capital frameworks, shape the immediate environment in which women's healthcare decisions occur.

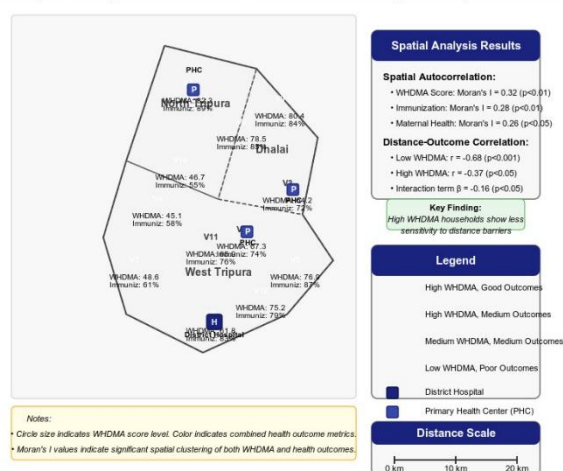
The household level includes gender dynamics (decision-making patterns, division of labor, resource control), economic factors (women's income contribution, resource mobilization, healthcare expenditure priorities), and family composition (extended vs. nuclear families, intergenerational relations, family size). These dimensions, analyzed through domains of empowerment theory and capabilities approach, constitute the immediate context for healthcare decision-making.

At the individual level, the model identifies women's capabilities (education, health knowledge, agency), gatekeeping mechanisms (knowledge integration, strategic navigation, intergenerational transfer), and health outcomes (child health indicators, maternal health status, family health practices). These individual factors, understood through feminist standpoint theory and agency theory, represent the direct manifestations of women's healthcare gatekeeping.

The bidirectional arrows connecting levels indicate the recursive relationship between structure and agency, with women's actions both shaped by and potentially transforming broader structures. This integrated framework provides a theoretical foundation for understanding the empirical findings presented elsewhere in the paper, situating women's healthcare gatekeeping within a complex web of multi-level influences rather than reducing it to either individual choice or structural determination.

Figure 4: Geospatial Analysis of Women's Healthcare Decision-Making Authority and Health Outcomes

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Description: Figure 4 presents a geospatial analysis of the relationship between Women's Healthcare Decision-Making Authority (WHDMA) and health outcomes across 12 villages in North, Dhalai, and West Tripura districts. This spatial representation provides insights into geographic patterns and contextual factors influencing the relationship between women's authority and health indicators.

The simplified map of Tripura with district boundaries displays village locations represented by color-coded circles. Circle size indicates WHDMA score level (larger circles represent higher scores), while color indicates health outcome quality (darker green for better outcomes). Healthcare facilities are marked with squares (blue for Primary Health Centers, darker blue for District Hospitals).

The spatial analysis results displayed in the upper right panel demonstrate significant spatial autocorrelation for both WHDMA scores (Moran's I=0.32, $p < 0.01$) and health outcomes including immunization rates (Moran's I=0.28, $p < 0.01$) and maternal health service utilization (Moran's I=0.26, $p < 0.05$). These statistically significant Moran's I values indicate non-random clustering of both women's decision-making authority and health outcomes across geographic space, suggesting spatial patterning of these variables.

The distance-outcome correlation analysis reveals an important interaction effect. While distance to healthcare facilities negatively predicts health outcomes for all households, this relationship is substantially stronger for households with low WHDMA scores ($r = -0.68$, $p < 0.001$) compared to households with high WHDMA scores ($r = -0.37$, $p < 0.05$). The significant interaction term ($\beta = -0.16$, $p < 0.05$) confirms that women's healthcare decision-making authority moderates the impact of geographic barriers on health outcomes.

This pattern is visually evident in villages like V9, which shows high WHDMA and good health outcomes despite considerable distance from healthcare facilities, compared to village V4, which demonstrates both low WHDMA and poor outcomes at a similar distance from services. These spatial relationships provide evidence that women's healthcare gatekeeping represents an adaptive response to structural healthcare barriers, with stronger women's decision-making authority helping to overcome geographic access challenges.

The geospatial analysis adds an important spatial dimension to understanding how women's healthcare authority operates within physical landscapes characterized by uneven healthcare infrastructure distribution, highlighting both the geographic clustering of similar household patterns and the differential effects of distance barriers based on women's decision-making power.