The role of Societal Lineage Structure and Work Burden on Women's Self-Rated Health: Insight from Matrilineal and Patrilineal Tribal society using Time Use Survey

Abstract

Indian tribal women often face poorer health due to their gender and ethnic minority status. Self-rated health (SRH) is an important measure in epidemiological research, as it reflects individuals' perceptions of their overall well-being. This study investigates the influence of different societal lineage systems (matrilineal and patrilineal) on the SRH of tribal women, focusing on the relationship between time spent in different activities and health. Based on primary time-use data collected from patrilineal tribal women (Tiwa and Karbi) in Assam and matrilineal tribal women (Khasi and Garo) in Meghalaya, descriptive statistics and ordered logistic regression models are used for analysis. Results indicate that 51.0% of matrilineal tribal women rated their health as good, and just 17.7% of women from patrilineal society. SRH also varies according to education, economic status, and distribution of domestic and caregiving responsibilities. Matrilineal women allocate more time to paid productive work and less to unpaid domestic tasks than patrilineal women. Regression demonstrated that the amount of time spent in paid productive work is positively correlated with better health (<=4 hours Coef:0.67, CI:0.02,1.33; >4 hours Coef:1.08, CI: 0.06,2.11). This study highlights the need for culturally sensitive health interventions based on the socio-cultural contexts of these tribal populations.

1. Introduction

Self-rated health (SRH) is a crucial concept in public health research, representing an individual's overall self-assessment of their health status. This subjective evaluation has been found to strongly correlate with objective health outcomes, such as morbidity and mortality (Idler & Benyamini, 1997; Lorem et al., 2020; Wu et al., 2013; Wuorela et al., 2020). Moreover, chronic illness, functional status, and psychological distress have been related to SRH, as well as social determinants of health (Golini & Egidi, 2016). One of the key strengths of SRH as a measure of health status is its comprehensive scope, encompassing a wide range of health determinants, including socio-demographic factors such as age, gender, income, and education, as well as other factors such as the presence of chronic conditions, disabilities, and mental health problems (Arokiasamy et al., 2016; Bora & Saikia, 2015; Mijatovic Jovanovic et al., 2020).

Among marginalized populations, tribal people in India continuously face poorer health than non-tribals (Haddad et al., 2012; Kumar et al., 2020). Indigenous tribal women, who often face multiple layers of disadvantage due to their gender and ethnic minority status, present unique challenges and opportunities for health research (Thummapol et al., 2018; Xaxa, 2004). Their health outcomes are influenced by a complex matrix of socioeconomic, cultural, and environmental factors (Chauhan & Jungari, 2021; Contractor et al., 2018; Jungari & Paswan, 2019; Rekik & van Es, 2022; Subramanian et al., 2006). The recent round of National Family and Health Survey showed issues such as anaemia, lower rates of institutional deliveries, and higher infant and under-five mortality rates are common for tribes (IIPS & ICF, 2021). Additionally, tribal women face challenges related to nutrition, sexually transmitted diseases, and genetic disorders (Krishna et al., 2024; Kshatriya & Acharya, 2016; Rao et al., 2009; Sharma et al., 2015).

The burden of work is a critical factor influencing health outcomes, contributing to a range of negative outcomes, from chronic stress to increased risk of illness, with substantial evidence highlighting the adverse effects of excessive work demands on physical and mental well-being (Borrell et al., 2014). Work burden includes paid and unpaid work. While paid employment brings forth financial resources and social engagement, it equally drags in physical and mental strain, especially if these are attached to long working hours and high demands, resulting in fewer opportunities for self-care, social interaction, and rest (Bakker & Demerouti, 2007). Across the globe, women contribute a larger share of household unpaid labour, mainly through household chores and child or elder care (Charmes, 2019). This is commonly referred to as 'invisible' work, done without being seen. Still, nevertheless, it consumes a large percentage of one's time and energy, leading to accumulated fatigue and stress (Craig & Mullan, 2010). It is evident that unequal burden of work at home lead to poor physical, mental and well-being of women (Goldberg & Perry-Jenkins, 2004; Harryson et al., 2012; Thurston et al., 2011).

Time use surveys provide a framework for understanding how individuals allocate their time across various activities, including work, leisure, and caregiving. This allocation is crucial in understanding gender disparities in health, as women typically bear a disproportionate burden of unpaid domestic work and caregiving responsibilities (Bittman & Wajcman, 2000; Hirway & Jose, 2011). For tribal women, these responsibilities can be even more pronounced due to traditional gender roles and limited access to health and social services (Desai et al., 2010). Furthermore, the structure of these responsibilities can vary significantly between matrilineal and patrilineal tribal societies, offering a unique comparative perspective. One of the underexplored aspects of their health is the use of time, particularly how time allocated to various activities impacts their self-rated health. Matrilineal societies, where lineage and inheritance are traced through the mother, often afford women greater autonomy and social status (Gneezy et al., 2009). In contrast, patrilineal societies, where lineage and inheritance are traced through the father, typically impose more restrictive gender roles on women, potentially impacting their health and well-being differently (Bhasin, 2007; Rathore & Das, 2022). Understanding these differences is crucial for developing health interventions tailored to the specific needs of women in these distinct social structures.

Theoretically, certain conceptual frameworks provide insight into the connection between workload and health. The role strain and resource scarcity frameworks offer valuable perspectives for examining the relationship between workload and self-rated health among tribal women. The role strain theory proposes that engaging in multiple roles, such as worker, caregiver, and homemaker, can lead to stress and negatively impact health (Goode, 1960). A study that supports this framework discovered that disproportionate responsibility for household management is associated with strains on mothers' personal well-being (Ciciolla & Luthar, 2019). In contrast, the resource scarcity framework emphasizes the limited availability of time and energy resources, suggesting that allocating these resources to various roles can deplete an individual's capacity to maintain good health (Hobfoll, 1989). Additionally, the intersectionality framework is crucial in understanding the compounded effects of gender, ethnicity, and socioeconomic status on the health of tribal women. This perspective highlights how intersecting identities and structural inequalities shape health outcomes (Bauer, 2014; Crenshaw, 1989). Applying this framework can elucidate the unique health challenges faced by tribal women, informing more tailored and effective interventions.

2. Previous research gap and Novelty of our study

While numerous investigations have been conducted to explore the health dynamics of women, a notable gap persists in comprehensively examining how time use affects self-rated health among tribal women, particularly within the context of differing social structures such as matrilineal and patrilineal societies. Most existing studies primarily focus on general population groups, often overlooking the unique socio-cultural contexts of matrilineal and patrilineal societies. Furthermore, the interplay

between different kinship systems, time allocation, and health outcomes among tribal women remains underexplored. This gap is exacerbated by the scarcity of comparative studies that analyse the differences between matrilineal and patrilineal systems in shaping women's health. Matrilineal and patrilineal societies allocate different roles, responsibilities, and power relationships to women, which significantly impact their health and well-being. However, the current body of research has not investigated such differences in social structure and how they interplay with women's health in these tribal communities. This lack of understanding hinders the development of culture-sensitive health interventions that can effectively address the unique needs of these populations.

This research aims to address these gaps by exploring the relationship between work burden and health among tribal women in both matrilineal and patrilineal societies. The study has focused on understanding how allocating time to various activities impacts their health perceptions and self-rated health. By comparing matrilineal and patrilineal tribal women, this investigation seeks to elucidate how different social structures influence these dynamics. This research has integrated quantitative time-use data with subjective health assessments to provide a comprehensive understanding of the health dynamics within these populations, thus contributing to the development of culturally appropriate health interventions.

3. Conceptual framework

Figure 1 depicts the conceptual framework for this study. It examines the complex relationship between societal lineage structures—matrilineal and patrilineal—and the self-rated health of tribal women, mediated by their time allocation across various activities and influenced by demographic and socioeconomic variables. The framework posits that the lineage structure influences the distribution of time spent in different activities, including unpaid domestic and caregiving work, unpaid and paid work in production, leisure, and self-care. These time allocation patterns, in turn, affect health outcomes, including SRH, healthcare accessibility, morbidity, and mortality. Furthermore, the framework considers how demographic and socioeconomic factors, such as age, education, work status, marital status, occupation, and relationship with the household head, further shape the health status of women within these distinct social structures. This comprehensive approach facilitates an understanding of how cultural and social contexts impact health, informing the development of targeted health interventions.

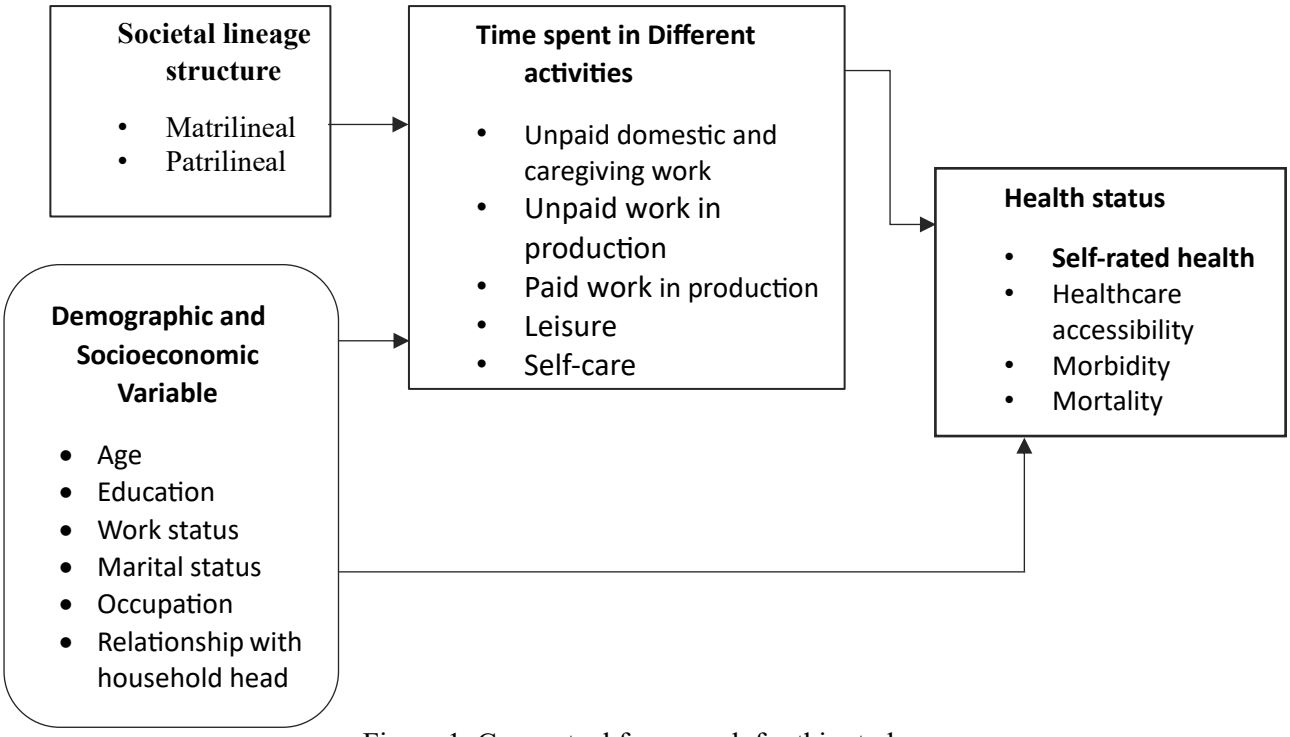

Figure 1: Conceptual framework for this study

4. Data and Methods

Data

This research is based on primary field data conducted from May to July 2023. As a comparative analysis, it examines two types of tribal societies, the *Garo* and *Khasi* from Meghalaya, who are matrilineal tribes, as well as the *Tiwa* and *Karbi* from Assam, who are patrilineal tribes. Women are between 15 and 49 years old. Interviews were conducted in the Rongjeng and Songsek blocks of the East Garo Hills district, Mylleim and Mawkinroh blocks of the East Khasi Hills district of Meghalaya, Kopili and Bhurbhanda blocks of the Morigaon district, and Lumbajong and Langsomepi block of Karbi Anlong district of Assam. Two villages were selected randomly from each block.

Sample size calculation

The following formula was used to calculate the adequate sample size for this study, this method is widely used in cross-sectional studies to estimate the prevalence of an unknown parameter (Cochran, 1977). Cochran's formula reference

$$sample\ size\ (n) = \frac{Z^2\ P(1-P)(1-R)}{d^2}$$

Where n is the sample size, Z is the statistic corresponding to level of confidence, P is the expected prevalence, R is the non-response rate, and d is the precision.

In this study, the P is considered 0.13 as a previous study shows that the proportion of good self-rated health status of tribal women is 13% (Koley & Chakraborty, 2018). The Z was decided based on the level of confidence aimed at 95% to present the estimates with 95% confidence Interval (CI). Non-reponse rate (R) was asumed to be 8%, and the precision (d) was assumed to be 5%. After applying these values in the formula, we got a final sample size (n) of 192. Since our study tries to compare the self-rated health status between two different tribal communities, there will be 192 samples from each community (192 from patrilineal and 192 from matrilineal tribes) and resulted in a total sample of 384.

For patrilinear tribal society, 96 *Karbi* women in Karbi Anlong district and 96 *Tiwa* women in Morigaon district Assam were interviewed. Similarly for matrilineal tribal society, 96 *Garo* women in East Garo district and 96 *Khasi* women in East Khasi Hills district were interviewed.

Nearly half of Meghalaya's inhabitants are *Khasi* people, who live in the Khasi hills and are part of the Austro-Asiatic ethnic group. Their traditional faith, *'Niam Khasi*,' centres on a Supreme Being called *'U Blei Nongthaw*.' While many have embraced Christianity, our research involved interviewing *Khasi* women from both religious backgrounds. The *Garo* people constitute about one-third of Meghalaya's population, residing in the Garo hills. They belong to the Tibeto-Burmese ethnic group and traditionally practised '*Songsarek*,' an animist religion. Most have now adopted Christianity, and our study included only Christian *Garo* participants. Their language is known as '*Achikku*.' The *Tiwa* tribe, prominent in Assam, is also of Tibeto-Burmese origin. They primarily communicate in Assamese and follow a religion with strong ties to Assamese Hinduism. The '*Naamghar*' plays a crucial role in their religious and social activities. The *Tiwa* are divided into Hill and Plain subgroups, with our study focusing on the latter. The *Karbi* tribe, part of the Mongoloid cluster and Sino-Tibetan linguistic family, mainly speaks the *Karbi* language. While many *Karbi*s practice variations of Vaishnavism within Hinduism, their original faith, '*Honghari*,' involves worshipping deities such as *Hemphu*, *Mukrang*, and *Rasinja*.

Outcome variable:

Self-rated health was defined by the answer to the question, "In general, how would you rate your health today?" The options to answer this question were available on a five-point Likert scale with reply alternatives: 1. Very good; 2. Good; 3. Moderate; 4. Bad; and 5. Very bad. To simplify the presentation of findings, this five-point scale was re-categorised into a three-point scale by combining very good and good into 'good', moderate to 'moderate', very bad and bad to 'poor'. So, the outcome variable (SRH) is in an ordered scale, coded '1' for poor, '2' for moderate and '3' for good.

Explanatory variable:

We analysed the self-rated health for both matrilineal and patrilineal tribes by a number of socio-demographic variables, including age, educational qualification (no education or up to primary, up to secondary, higher secondary and above); religion (Hinduism, Christian, Niam Khasi, Animism); marital

status (currently married, never married and separated/widowed); relationship with household head (Head, Wife, Daughter, Daughter-in-law and Mother). The economic variables include wealth quintiles of households (Poor, Middle, and Rich) and occupations of women (Students, Housewives, Cultivators, Shopkeepers, Teachers, Other govt jobs, and Others). Furthermore, Time use patterns (using time diaries) of different tribal societies were used as explanatory variables with a 24-hour recall methodology. For a better analysis of the data, the activities from the 24-hour time-use recall were regrouped into composite activity groups such as Unpaid domestic and caregiving work, paid productive work, unpaid productive work, and leisure activities.

Statistical method

Descriptive statistics were used to calculate the SRH of each tribal society for each socio-demographic and economic variable. After that, SRH among matrilineal and patrilineal tribal women by average time spent (in minutes) on various activities was calculated.

We conducted three ordered logistic regression models to investigate factors influencing self-rated health among tribal women, aiming to assess the adjusted effect of societal lineage structure on self-rated health (SRH). The first model (Model 1) depicts the unadjusted effect of societal structure on self-rated health. The second model (Model 2) assesses societal lineage structure's adjusted demographic and socioeconomic effect. The third model (Model 3) includes the variables related to time-use pattern of women to understand the adjusted demographic, socioeconomic and daily work burden effect of societal structure on women's self-rated health.

5. Results

Sample distribution of the study population

Table 1 illustrates the distribution of matrilineal and patrilineal tribal women across various demographic and socioeconomic variables. Both matrilineal and patrilineal women are predominantly found in the 21-30 and 31-40 age groups, each comprising approximately 35% of their respective populations. A notable disparity exists in educational attainment between the two groups. Matrilineal women exhibit higher rates of higher secondary or above education (19.8%) compared to patrilineal women (3.1%). Conversely, patrilineal women have a higher percentage of no education or up to primary (49.5%) compared to matrilineal women (35.4%). Religion shows a clear division, as matrilineal women primarily follow Christianity (74.0%) and Niam Khasi (26.0%), while patrilineal women are predominantly Hindu (80.7%) and Animist (19.3%) in this sample. A majority of both matrilineal and patrilineal women are married (88.0% and 99.0%, respectively), with no unmarried patrilineal women recorded in the sample. It is worth noting that a significant proportion of matrilineal women (56.8%) were heads of their households, while none of the patrilineal women held this position.

Among patrilineal women, the largest subgroups were wives, daughters-in-law or mother (99.0%). In terms of socioeconomic status, the wealth index reveals that a higher percentage of matrilineal women were categorized as rich (44.3%) compared to patrilineal women (21.9%). Conversely, a higher percentage of patrilineal women (55.7%) fall in the poor category, compared to matrilineal women (11.5%).

Table 1: Sample distribution of matrilineal and patrilineal tribal women in the study area based on primary fieldwork, 2023.

Variables	Percentage		Total sample size	
	Matrilineal	Patrilineal	Matrilineal	Patrilineal
Age groups in year				
less than equal 20	8.9	7.3	17	14
21-30	35.4	35.9	68	69
31-40	34.4	35.9	66	69
more than 40	21.4	20.8	41	40
Educational Qualification				
No education or up to primary	35.4	49.5	68	95
Up to secondary	44.8	47.4	86	91
Higher secondary and above	19.8	3.1	38	6
Religion				
Hinduism	0	80.7	0	155
Christian	74.0	0	142	0
Niam Khasi	26.0	0	50	0
Animism	0	19.3	0	37
Marital status				
Unmarried	12.0	0	23	0
Married	88.0	99.0	169	190
Separated/widow	0.0	1.0	0	2
Relationship with household head				
Head	56.8	0.0	109	0
Daughter	39.1	1.0	75	2
Daughter-in-law/Wife/Mother	4.2	99.0	8	192
Wealth index				
Poor	11.5	55.7	22	107
Middle	44.3	22.4	85	43
Rich	44.3	21.9	85	42

Self-rated health among matrilineal and patrilineal tribal women

The data in Table 2 illustrates the self-rated health status of various socio-demographic and economic variables. Matrilineal women rate their health better than patrilineal women, with 51.0% rating it as good compared to just 17.7% of patrilineal women. Conversely, 54.2% of patrilineal women rate their health as poor, compared to 21.9% of matrilineal women. When examining the data by age, matrilineal women in all age groups report better health status than their patrilineal counterparts. For instance,

matrilineal women aged ≤20 reported 82.4% good health, while only 21.4% of patrilineal women in the same age group reported good health. Similarly, 47.1% of matrilineal women and 13.0% of patrilineal women aged 21-30 reported good health. Regarding education, data indicates that matrilineal women report better health outcomes among those with higher secondary and above education—for instance, those these women rate their health as good at 63.2%. Among matrilineal women, Christians and those following Niam Khasi report better health (47.2% and 62.0% good, respectively) than their patrilineal counterparts, where Hindus report better health (19.4% good). Married women in both groups tend to rate their health similarly, though matrilineal women have a slightly higher good health rating (48.5%). Finally, matrilineal household heads rate their health better (43.1% good) compared to patrilineal women who are wives (42.9% good).

Considering the economic status, it is observed that matrilineal women with greater wealth tend to rate their health more favourably (55.3% good) in comparison to poor women (40.9% good). A similar pattern is evident among patrilineal women; however, their overall good health ratings are lower. Among matrilineal women, 9.1% of students rated their health poor, 27.3% moderate, and 63.6% good. Among housewives, 32.7% rated their health as poor, 16.3% as moderate, and 51.0% as good. For cultivators, 23.4% rated their health as poor, 35.9% as moderate, and 40.6% as good. Shopkeepers had 7.1% rating their health as poor, 28.6% as moderate, and 64.3% as good. Those in government jobs and teaching rate their health highly, with 66.7% and 60.0% good ratings, respectively. Patrilineal women in other occupations display varied health ratings, with the lowest good health rating in 'other' jobs (5.6%). Meanwhile, 56.8% of housewives rated their health as poor, 24.7% as moderate, and 18.5% as good. Cultivators had 54.6% rating their health as poor, 27.3% as moderate, and 18.2% as good.

In the matrilineal tribal society, women spending more time in unpaid domestic and caregiving work (360 minutes) and less time in paid productive work (177 minutes) tend to have poorer health. Meanwhile, women who spend comparatively less time in unpaid domestic and caregiving work (258 minutes) and moderate time in paid productive work (228 minutes) report poorer health. However, those who spend more time on productive work (249 minutes) and a considerable amount of time on paid productive work (302 minutes) rate their health as moderate. In this society, women generally dedicate minimal time to unpaid productive work. In contrast, in the patrilineal tribal society, women spend significantly more time in unpaid domestic and caregiving work (414 minutes) and, comparatively very little time in paid productive work (43 minutes) and more time in unpaid productive (69 minutes) work results in women with poor health. Meanwhile, women who spend almost similar time as poor health women in unpaid domestic and caregiving work (414 minutes) but dedicate more time to paid productive work (88 minutes) and little in unpaid productive work (31 minutes) tend to have good health. Additionally, women who allocate comparatively bit less time in unpaid domestic and caregiving work (398 minutes) and a similar time as women with good health in paid productive work (87 minutes) but more time in unpaid productive (56 minutes) work tend to have moderate health.

Table 2: Self-rated health about current health status among matrilineal and patrilineal tribal women by demographic and social variables in the study area based on primary fieldwork, 2023.

Variables	Self-rated health (%)					
	Matrilineal			Patrilineal		
	Poor	Moderate	Good	Poor	Moderate	Good
Overall sample	21.9	27.1	51.0	54.2	28.1	17.7
Demographic and social characteristics						
Age groups in year						
less than equal 20	5.9	11.8	82.4	50.0	28.6	21.4
21-30	29.4	23.5	47.1	63.8	23.2	13.0
31-40	18.2	30.3	51.5	40.6	36.2	23.2
more than 40	22.0	34.2	43.9	62.5	22.5	15.0
Educational Qualification						
No education or up to primary	19.1	36.8	44.1	61.1	23.2	15.8
Up to secondary	25.6	23.3	51.2	48.4	34.1	17.6
Higher secondary and above	18.4	18.4	63.2	33.3	16.7	50.0
Religion						
Christian	21.1	31.7	47.2	NA	NA	NA
Niam Khasi	24.0	14.0	62.0	NA	NA	NA
Hinduism	NA	NA	NA	50.3	30.3	19.4
Animism	NA	NA	NA	70.3	18.9	10.8
Marital status						
Unmarried	8.7	21.7	69.6	NA	NA	NA
Married	23.7	27.8	48.5	54.2	27.9	17.9
Separated/widow	NA	NA	NA	50.0	50.0	0.0
Relationship with household head						
Head	27.5	29.4	43.1	NA	NA	NA
Daughter	14.7	22.7	62.7	50.0	50.0	0.0
Daughter-in-law/Wife/Mother	12.5	37.5	50.0	54.2	27.9	17.9
Economic characteristics						
Wealth index						
Poor	27.3	31.8	40.9	65.4	20.6	14.0
Middle	25.9	24.7	49.4	53.5	34.9	11.6
Rich	16.5	28.2	55.3	26.2	40.5	33.3
Occupation						
Student	9.1	27.3	63.6	NA	NA	NA
Housewife	32.7	16.3	51.0	56.8	24.7	18.5
Cultivator	23.4	35.9	40.6	54.6	27.3	18.2
Shopkeeper	7.1	28.6	64.3	NA	NA	NA
Teacher	10.0	30.0	60.0	NA	NA	NA
Other govt job	33.3	0.0	66.7	0.0	0.0	100.0
Other	30.8	30.8	38.5	33.3	61.1	5.6

*NA=Not applicable

Daily time-use pattern of women from matrilineal and patrilineal societies

Figure 2 presents the average times spent on different activities by women belonging to different tribal societies. It is reported that the participation rate in daily household chores is higher for patrilineal tribal women (average 406 minutes) than matrilineal tribal women (average 292 minutes). In contrast, women from matrilineal societies spend an average of 223 minutes in paid productive activities, while their counterparts from patrilineal societies spend 64 minutes on the same activity. Meanwhile, patrilineal tribal women spent more time in unpaid productive work, i.e., 92 minutes, whereas matrilineal tribal women spent only 13 minutes in unpaid productive work. However, there is no such difference in spending time on leisure activities.

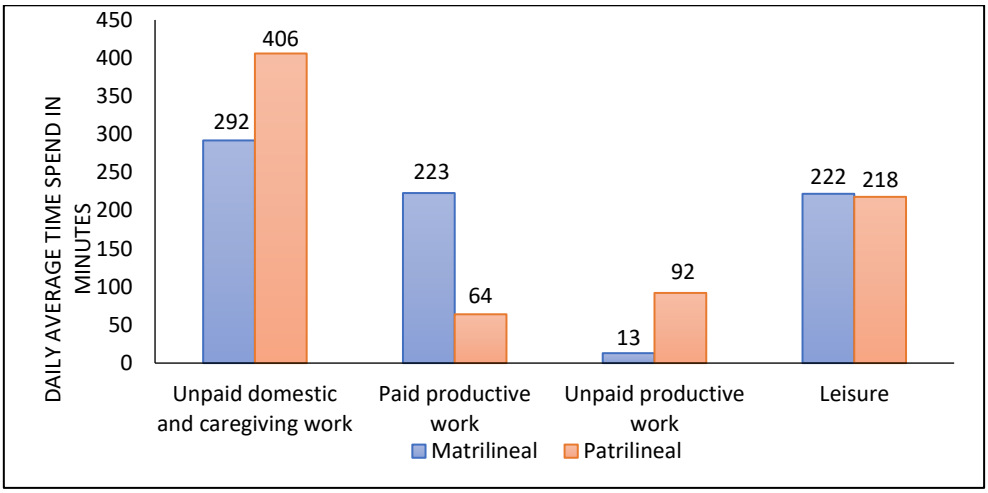

Figure 2: Daily average time (in minutes) spent on different activities by women from matrilineal and patrilineal tribal societies

Self-rated health and time allocation of women from matrilineal and patrilineal tribal societies

Figure 3 provides data on the self-rated health status of matrilineal and patrilineal tribal women based on the average time spent in unpaid domestic and caregiving work, paid productive work, unpaid productive work and leisure. In the matrilineal tribal society, women spending more time in unpaid domestic and caregiving work (360 minutes) and less time in paid productive work (177 minutes) tend to have poorer health. Meanwhile, women who spend comparatively less time in unpaid domestic and caregiving work (258 minutes) and moderate time in paid productive work (228 minutes) report poorer health. However, those who spend more time on productive work (249 minutes) and a considerable amount of time on paid productive work (302 minutes) rate their health as moderate. In this society, women generally dedicate minimal time to unpaid productive work.

In contrast, in the patrilineal tribal society, women spend significantly more time in unpaid domestic and caregiving work (414 minutes) and, comparatively very little time in paid productive work (43 minutes) and more time in unpaid productive (69 minutes) work results in women with poor health.

Meanwhile, women who spend almost similar time as poor health women in unpaid domestic and caregiving work (414 minutes) but dedicate more time to paid productive work (88 minutes) and little in unpaid productive work (31 minutes) tend to have good health. Additionally, women who allocate comparatively bit less time in unpaid domestic and caregiving work (398 minutes) and a similar time as women with good health in paid productive work (87 minutes) but more time in unpaid productive (56 minutes) work tend to have moderate health.

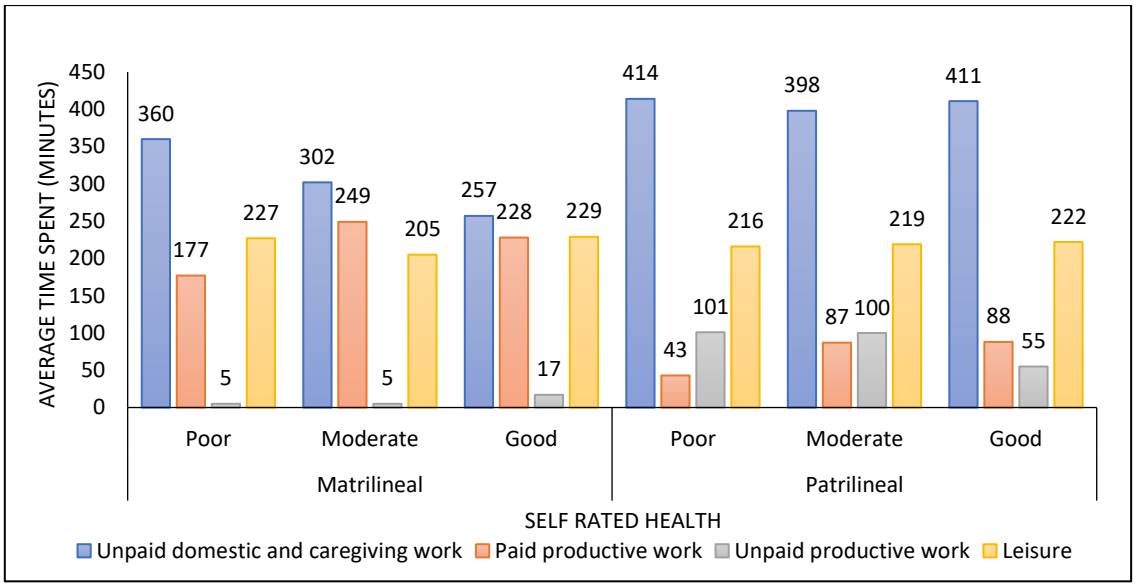

Figure 3: Self-rated health about current health status among matrilineal and patrilineal tribal women by average time (in minutes) spent on unpaid domestic and caregiving work, paid productive work and unpaid productive work, leisure.

Table 3 provides data on the self-rated health status of matrilineal and patrilineal tribal women based on the average time spent in different daily activities. The data reveals distinct patterns in time allocation. For example, matrilineal women with poor health spend an average of 132 minutes cooking, while those with good health spend 88 minutes. Similarly, patrilineal women with poor health spend 140 minutes on cooking, and those with good health spend 145 minutes. With regard to caregiving children, women who report better health spend less time compared to those with poorer health, a trend that is consistent across both matrilineal and patrilineal societies. In a matrilineal society, women spend more time in caregiving activities for children who report their health as poor, while those who report their health as good spend less time in caregiving activities. Matrilineal women with better health tend to spend more time on paid productive work and less time on unpaid work. In contrast, patrilineal women with good health spend significantly less time on both paid and unpaid primary work compared to those with poor health. Interestingly, in a matrilineal society, women who spend more time in primary work tend to have poorer health, while those who spend more time in tertiary work tend to have good health. Time spent on leisure activities, such as spending quality time with family and neighbours, and sleeping or resting, does not show a strong variation in health status in either group.

Table 3: Self-rated health about current health status among matrilineal and patrilineal tribal women by average time (in minutes) spent in different daily activities.

Time spent in Different activities (minutes)	Self-rated health					
	Matrilineal			Patrilineal		
	Poor	Moderate	Good	Poor	Moderate	Good
Household chores						
Cooking	132	111	88	140	141	145
House Cleaning	27	23	23	35	38	42
Utensil cleaning	26	25	17	36	36	37
Washing cloths	32	27	22	32	35	33
Fetching water	10	6	7	14	11	15
Fuelwood collection	10	16	8	5	1	1
Other household work	6	7	8	8	9	8
Marketing HH need	12	12	10	9	7	6
Caregiving activities						
Caregiving adult household member	20	27	22	48	41	49
Caregiving children	75	57	44	86	73	70
Dropping and picking up children from school	14	10	10	6	6	4
Teaching children	18	11	16	9	8	13
Productive work						
Primary economic activity	103	138	98	51	48	28
Farming	97	133	92	29	35	12
Farming paid	97	133	92	7	21	6
Farming unpaid	NA	NA	0.61	22	14	6
Livestock overall	6	5	6	22	13	16
Livestock paid	0.7	0.6	2	6	1	4
Livestock unpaid	5	4	4			
Paid primary work	98	134	93	13	25	10
Unpaid primary work	5	4	4	37	23	19
Secondary economic activity	6	2	10	69	67	72
Secondary paid	6	2	NA	11	18	36
Sec unpaid	NA	NA	10	30	30	13
Production for own use	NA	NA	NA	28	21	23
Tertiary economic activity	73	113	135	19	45	42
Leisure activity						
Spending quality time with family	66	64	62	50	51	51
Spending quality time with neighbour	15	12	14	32	29	33
Sleeping and resting during the day	136	119	136	124	122	122
Prayer	10	9	12	28	25	26

Table 4 presents the results of ordered logistic regression analyses examining the factors associated with self-rated health among tribal women across three models. The first model indicates that patrilineal women have significantly lower reporting of better health compared to matrilineal women.

Model 2 highlights that after controlling the other socioeconomic and demographic variables, women from patrilineal society are significantly associated with poorer self-rated health. Whereas age, education levels, and relationships with the household head did not show significant associations. The wealth index, however, showed that being middle-income and rich had positive associations with better self-rated health.

In model 3, after controlling the daily time allocation in different activities and number of daily household and caregiving activities, women from patrilineal society still report significantly worse self-reported health. Age and education still show no significant effects. Higher wealth index is positively associated with better self-rated health, with middle and rich categories showing significant positive coefficients (0.56 and 1.03, respectively). Time spent in paid productive work is also positively associated with better health, with significant coefficients for engagement up to 4 hours (Coef: 0.67) and more than 4 hours (Coef: 1.08). Other variables, including education level, relationship with household head, occupation, and time spent in unpaid work, showed insignificant associations with self-rated health.

Table 4: Result from ordered logistic regression showing the factor associated with self-rated health among tribal women.

Variables	Coefficient		
	Mode 1	Model 2	Model 3
Type of tribal society			
Matrilineal @r			
Patrilineal	-1.50*** [-1.90,-1.11]	-1.25*[-2.52,0.03]	-1.66*[-3.05,-0.27]
Age (continuous)		0[-0.03,0.03]	-0.02[-0.06,0.02]
Education			
No education or up to primary @r			
Up to secondary		0.1[-0.39,0.59]	0.31[-0.21,0.83]
Higher secondary and above		0.14[-0.70,0.99]	0.05[-0.81,0.92]
Relationship with household head			
Head @r			
Daughter		0.56[-0.16,1.28]	0.51[-0.25,1.27]
Other		0.45[-0.84,1.74]	0.91[-0.47,2.28]
Wealth index			
Poor @r			
Middle		0.5*[-0.02,1.03]	0.56*[0.02,1.11]

Rich	0.95***[0.39,1.51]	1.03***[0.45,1.61]
Occupation		
Student @r		
Housewife	-0.37[-1.44,0.71]	-0.46[-1.75,0.83]
Working	-0.02[-1.10,1.07]	-0.68[-2.05,0.68]
Daily time spend in unpaid domestic and caregiving work		
Up to 5 hours @r		
5-7 hours		0.19[-0.62,0.99]
More than 7 hours		-0.42[-1.42,0.57]
Daily time spend in paid productive work		
Not engaged @r		
Up to 4 hours		0.67*[0.02,1.33]
more than 4 hours		1.08*[0.06,2.11]
Daily time spend in unpaid productive work		
Not engaged @r		
Up to 2 hours		0.56*[0.03,1.08]
More than 2 hours		-0.1[-0.92,0.73]
No of daily household and caregiving activities		
Up to 5 @r		
5-7 hours		0.14[-0.58,0.86]
8-9 hours		0.07[-0.85,0.99]
Daily time spend in leisure		
Up to 3 hours @r		
3-4 hours		0.08[-0.44,0.61]
more than 4 hours		0.31[-0.34,0.95]
Cut 1		-0.61[-2.39,1.18]
Cut 2		0.82[-0.96,2.60]

@r=Reference category; * p<0.05, ** p<0.01, *** p<0.001

6. Discussion

This study examines the relationship between time use and self-rated health among matrilineal and patrilineal tribal women, revealing notable disparities that highlight broader socioeconomic and cultural dynamics at play. Few earlier studies have revealed an association between ethnic/racial and SRH disparities across certain socioeconomic groups (Beck et al., 2014; Erving & Zajdel, 2022). People from ethnic minority backgrounds tend to rate their health worse than the dominant population (Bombak & Bruce, 2012).

In our study, the societal structures of matrilineal and patrilineal communities significantly shape these time-use patterns. In matrilineal societies, women often hold positions of authority and influence within the household, which may lead to greater autonomy over their time and activities. This autonomy likely enables matrilineal women to manage their responsibilities more effectively, resulting in better health

outcomes. In contrast, patrilineal societies typically enforce more rigid gender roles and belong to economically disadvantaged backgrounds. In this context, earlier studies also showed that rigid gender roles confined women to domestic spheres, limiting their opportunities for paid employment and personal development (Coltrane, 2004; Duflo, 2012; KANDIYOTI, 1988). These constraints not only restrict women's economic opportunities but also exacerbate the health disparities observed in this study (Heise et al., 2019; Vos et al., 2020). Additionally, women from matrilineal societies are more empowered in decision-making and enjoy greater freedom of movement than their patrilineal counterparts, which contributes to better health outcomes for matrilineal women (Mal & Saikia, 2024).

This study highlights a substantial difference in time allocation between matrilineal and patrilineal women and its impact on health. Matrilineal women who allocate more time to paid productive work and less to unpaid domestic tasks report better health outcomes. This finding is consistent with prior research suggesting that increased participation in paid labour can improve women's autonomy and access to health resources, resulting in better overall well-being (Bird & Fremont, 1991; Strazdins et al., 2013). On the other hand, patrilineal women allocate a disproportionate amount of time to unpaid domestic work and unpaid productive work, including production for their own use, which is associated with poorer health outcomes. This may be due to extensive domestic labour's physical and psychological stress, leaving little time for rest, self-care, or engaging in economically productive activities that could enhance their quality of life (Bird, 1999; CRAIG & JENKINS, 2016).

Additionally, this study found that patrilineal tribal women are generally poorer than their matrilineal counterparts. Household wealth was identified as a crucial determinant of health outcomes among tribal women, as evidenced by the significant positive association between higher wealth and better self-rated health observed in this study. Individuals from wealthier households have better access to healthcare, nutritious food, quality housing, and safer living environments, all of which contribute to improved health outcomes (Marmot, 2002). Moreover, economic stability reduces stress related to financial insecurity, which adversely affects health (Cohen et al., 2016). Wealth is often associated with increased educational attainment and health literacy, enabling individuals to engage in health-promoting behaviours and make informed decisions about their health (Baker et al., 2011). Participation in economic activities also plays a significant role in shaping health outcomes. Matrilineal women who enjoy better health are more likely to engage in tertiary economic activities, often involving diverse and potentially less physically demanding tasks. This engagement in such activities may contribute to their better health outcomes. The social determinants of the health framework highlight how socioeconomic factors, including income and social support, influence health outcomes (Marmot, 2002; Solar & Irwin, 2010). The economic stability matrilineal women derive from their greater participation in paid work likely contributes to better health outcomes.

The study further sheds light on the consequences of daily routines on health. The matrilineal women who are in good health tend to allocate less time to household tasks such as cooking and caregiving, when contrasted with those in poor health. This observation indicates that alleviating the responsibility associated with household chores and caregiving could have a positive influence on health outcomes. This notion is consistent with the role strain theory, which posits that managing multiple roles, particularly conflicting ones, can result in stress and detrimental health effects (Cheng et al., 2021; Goode, 1960; Pearlin, 1989). The pattern among patrilineal women is comparable but more pronounced. Women in poor health spend significant time on domestic tasks in patrilineal societies, which may contribute to poorer health outcomes. The theory of gender and power offers a valuable perspective for understanding these disparities (Connell, 1987). This theory delves into how societal power dynamics and gender roles affect women's access to resources and opportunities, ultimately impacting their health. In patrilineal societies, traditional gender roles restrict women to domestic spheres, limiting their chances for paid employment and personal development and adversely affecting their health (Connell, 1987; Hyde et al., 2019; Wingood & DiClemente, 2000).

7. Conclusion

This study highlights the role of societal lineage structures and work burdens on the self-rated health of tribal women in matrilineal and patrilineal societies. Women belonging to matrilineal systems generally report good health, probably a consequence of the high level of autonomy and social status accorded by their lineage system. Still, patrilineal women experience more restrictions in the system of gender roles, which may contribute to poor health perception. Again, this research shows the critical role of household wealth in shaping the health perceptions among these women. Matrilineal tribal women, who typically have more balanced time distributions between paid and unpaid work, exhibit better health ratings compared to their patrilineal counterparts, who bear a heavier burden of unpaid domestic and caregiving responsibilities.

These findings underscore the need for culturally sensitive health interventions that consider matrilineal and patrilineal societies' social, economic, and cultural environments. Policies and programs should focus on reducing the work burden and increasing access to paid productive activities, education and other healthcare services to improve the health and well-being of tribal women.

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