



Understanding the HRP-MMR Paradox: A Sociological Analysis of Maternal Health among Rural Women in Karnataka

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Abstract

Maternal health outcomes in rural India are influenced by a complex interaction of socio-economic, service accessibility, and systemic care factors. This study examines the differences in High-Risk Pregnancy (HRP) identification and Maternal Mortality Ratio (MMR) between two talukas Hukkeri and Khanapur in Belagavi District, Karnataka. A cross-sectional survey was conducted among 380 pregnant women using a structured interview schedule. Descriptive statistics were used to analyze service utilization and barriers. Results showed that Hukkeri demonstrated earlier antenatal care (ANC) initiation, better financial preparedness, and improved communication from health workers, which contributed to higher HRP identification and comparatively lower MMR. Conversely, Khanapur reflected delayed ANC registration, weaker emergency preparedness, and significant financial and transportation barriers, explaining the higher MMR despite lower HRP reporting. The study recommends strengthening early pregnancy screening, addressing socio-economic inequities, and improving quality of care to reduce preventable maternal deaths. Findings highlight the urgent need for targeted maternal health interventions in socio-economically vulnerable rural regions.

Keywords: Maternal Health, High-Risk Pregnancy, MMR, Service Barriers, Rural Women, Karnataka, Sociological Study

Introduction

Maternal health continues to be a critical public health concern in India, especially in rural settings where access to timely and adequate healthcare remains limited. Despite improved institutional delivery rates, disparities in early risk detection and emergency care contribute significantly to avoidable maternal mortality. Belagavi District, known for its mixed terrain and cultural diversity, exhibits notable differences in MMR and HRP proportions between its talukas. Khanapur shows **higher maternal deaths but lower HRP identification**, while Hukkeri records **better HRP detection and fewer maternal deaths**. This paradox suggests that systemic and socio-structural factors shape the health outcomes of pregnant women beyond clinical vulnerabilities. Understanding this sociological dimension is essential for designing evidence-based interventions that improve maternal safety. This study therefore explores the relationship between socio-economic preparedness, healthcare access, HRP communication, and maternal health outcomes in Hukkeri and Khanapur talukas.

A **descriptive cross-sectional research design** was adopted for the study, conducted in two rural talukas of Belagavi district, Karnataka **Hukkeri and Khanapur** representing distinct socio-geographical settings. Belagavi district, located in north-western Karnataka, exhibits diverse cultural and linguistic composition, a strong agrarian base, and varied access to healthcare facilities. **Hukkeri taluka**, situated along the National Highway corridor, benefits from better connectivity to major towns, markets, and referral hospitals in Belagavi city and Gokak. The area has relatively accessible transportation, enabling timely access to maternal health services. Agriculture, small-scale trading, and industrial employment contribute to moderate household financial stability, supporting socio-economic preparedness for maternal health emergencies. In contrast, **Khanapur taluka** lies in the hilly Western Ghats region, with many villages surrounded by dense forests and located far from primary and secondary healthcare centres. High dependence on agriculture and forest-based livelihoods results in comparatively lower household income, limiting financial readiness for handling pregnancy complications. Poor road infrastructure and seasonal monsoon disruptions further delay access to emergency care. Both talukas host Government primary health centres (PHCs), sub-centres, and community health workers, including ASHAs and Anganwadi personnel. However, significant discrepancies exist in service availability and accessibility. Hukkeri residents have quicker access to taluka hospitals and private maternity services, while Khanapur women often depend on distant facilities, increasing risk during emergency referrals. Cultural practices, such as strong family decision-making by elders and limited maternal autonomy, affect healthcare-seeking behavior in both talukas, but are more pronounced in Khanapur. The study aimed to,

1. Examine service utilization patterns, particularly the timing of the first antenatal care (ANC) visit.
2. Analyze high-risk pregnancy (HRP) identification and communication by health workers.
3. Identify systemic and behavioral barriers contributing to variations in maternal outcomes.
4. Recommend strategies to bridge gaps between HRP detection and maternal mortality reduction.

A pre-tested structured interview schedule, including both open- and closed-ended questions, was used to collect data on socio-demographic characteristics, healthcare access, HRP awareness, and barriers to service utilization. Data were analyzed using **descriptive statistics**, such as frequency and percentage distributions,

and results were presented in tables aligned with the study objectives. Confidentiality and voluntary participation were ensured, and informed consent was obtained from all respondents.

Table: 1: Socio-Demographic Profile of the Respondents by Taluka

Age-Group	Hukkeri	Khanapur	Total	Freq.
20-25	13.4	12.3	25.7	100
26-30	13.6	10.8	24.4	95
31-35	22.4	6.2	28.5	111
36 -40	12.3	9	21.3	83
Religion of the Respondents				
Hindu	49.9	31.1	81	315
Muslims	9.8	3.1	12.9	50
Christians	1.8	1	2.8	11
Caste of the Respondents				
Sheduled Caste	15.4	5.7	21.1	82
Sheduled Tribe	6.4	3.1	9.5	37
Other Backward Classes	24.9	15.7	40.6	158
Others	14.9	13.9	28.8	112
Educational Status				
Primary education	8.0	8.2	16.2	63
Secondary education	3.1	1.5	4.1	16
SSLC	28.8	15.4	44.7	174
PUC	11.1	5.1	16.2	63
Graduation and Above	10.8	8.0	18.8	73
Access to Clean Water				
Yes	61	36.1	97.1	374
Access to Toilet Family				
Yes	39.1	33.9	73	284
Total	61.7	38.3	100.0	389

Table 1 presents the socio-demographic characteristics of respondents in Hukkeri and Khanapur talukas. The majority of women belong to the 31–35 years' age group (28.5%), followed by 20–25 years (25.7%) and 26–30 years (24.4%). Most respondents are Hindus (81%), with Muslims (12.9%) and Christians (2.8%) forming smaller proportions. Regarding caste, Other Backward Classes constitute the largest group (40.6%), followed by Others (28.8%), Scheduled Castes (21.1%), and Scheduled Tribes (9.5%). Educationally, most women have completed SSLC (44.7%), while 18.8% have graduation or higher qualifications. Nearly half of the women (47.3%) are currently working, with Hukkeri showing higher employment than Khanapur. Housing patterns reveal that most families live in pucca houses (64.3%), and a majority own agricultural land (69.4%), with better coverage in Hukkeri. Access to clean water and toilets is relatively high (97.1% and 73%, respectively), yet Hukkeri households have better access than those in Khanapur. Overall, Hukkeri demonstrates stronger socio-economic conditions, while Khanapur exhibits comparatively lower indicators, which may influence maternal health awareness, care-seeking behavior, and health outcomes

Table 2: Accessibility to Transport and Financial Resources by Taluka

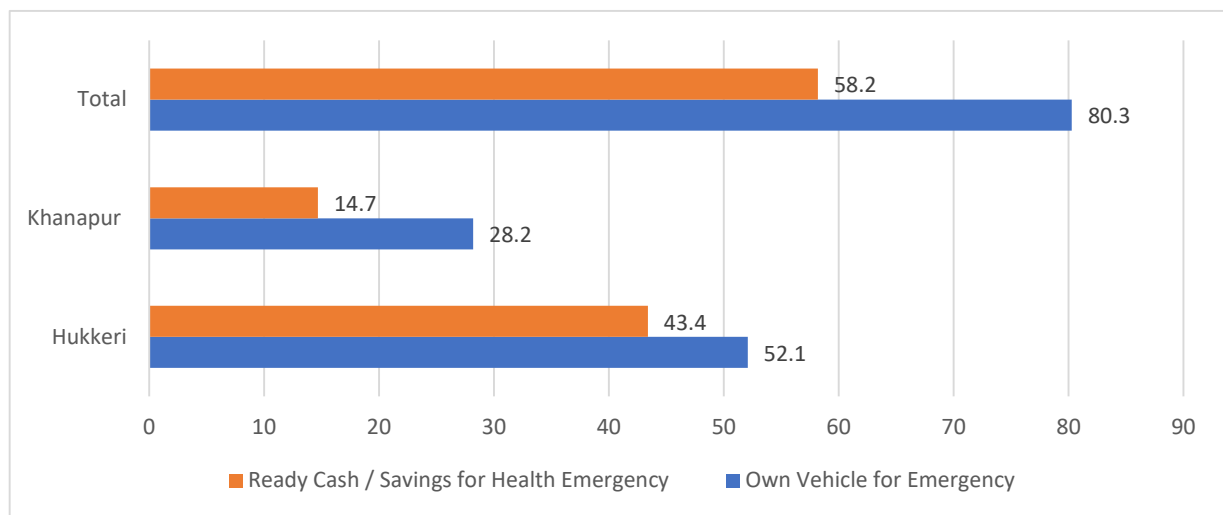


Table 2 highlights the households’ preparedness for maternal health emergencies in both talukas. A significantly higher proportion of families in Hukkeri own a motorized vehicle (52.1%) compared to Khanapur (28.2%), indicating better mobility during complications or delivery. Similarly, access to ready cash or savings is more common in Hukkeri (43.4%) than in Khanapur (14.7%), enabling timely utilization of essential maternal healthcare services. In contrast, a larger proportion of women in Khanapur (22.1%) reported not having financial reserves readily available, revealing greater vulnerability in crisis situations. Due to this lack of immediate financial and transport support, families in Khanapur often rely on borrowed resources or face delays in arranging transport, especially during obstetric emergencies. These findings suggest that economic strength and transportation access are crucial determinants in reducing maternal health risks and ensuring timely institutional care. When such preparedness is lacking, as seen in Khanapur, the probability of complications escalating without intervention becomes much higher. Thus, socio-economic readiness plays a pivotal role in maternal survival outcomes and safe motherhood practices.

Table 3: First ANC Check-up Among Respondents by Taluka

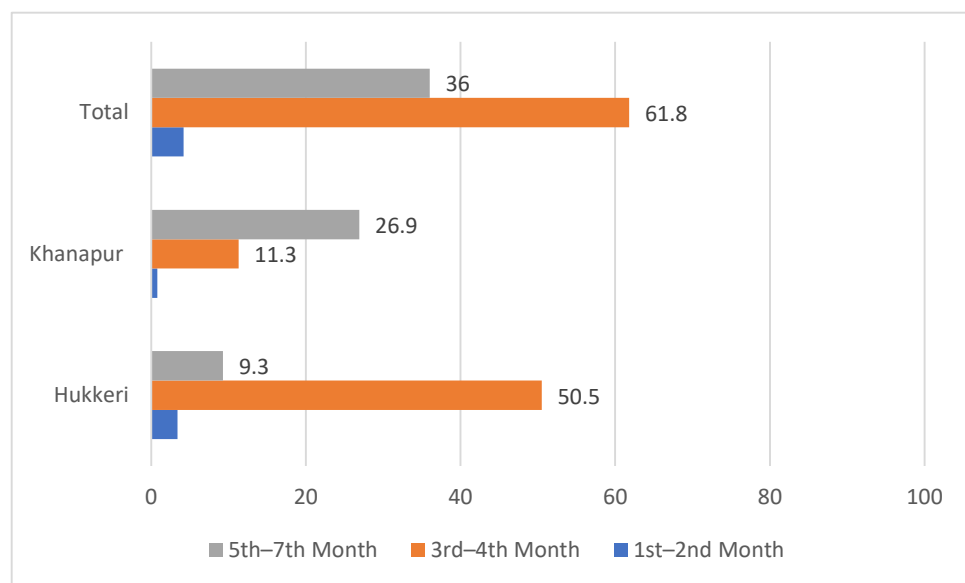


Table 3 presents the timing of the first antenatal care (ANC) visit, which is critical for early risk detection. In Hukkeri, most pregnant women undergo their first check-up during the 3rd or 4th month, reflecting good awareness and accessibility of maternal healthcare services. However, in Khanapur, ANC initiation peaks around the 5th month or later, indicating delayed engagement with the health system. Such delay restricts early screening for conditions like anemia, hypertension, and gestational diabetes. Limited knowledge, transport challenges, and financial constraints further cause postponement in care-seeking. When high-risk conditions are detected late, it becomes difficult for the health system to respond effectively. Therefore, delayed ANC is a major contributor to undiagnosed high-risk pregnancies and increased maternal complications in Khanapur.

Table 4: Identification and Causes of High-Risk Pregnancy (HRP) by Taluka

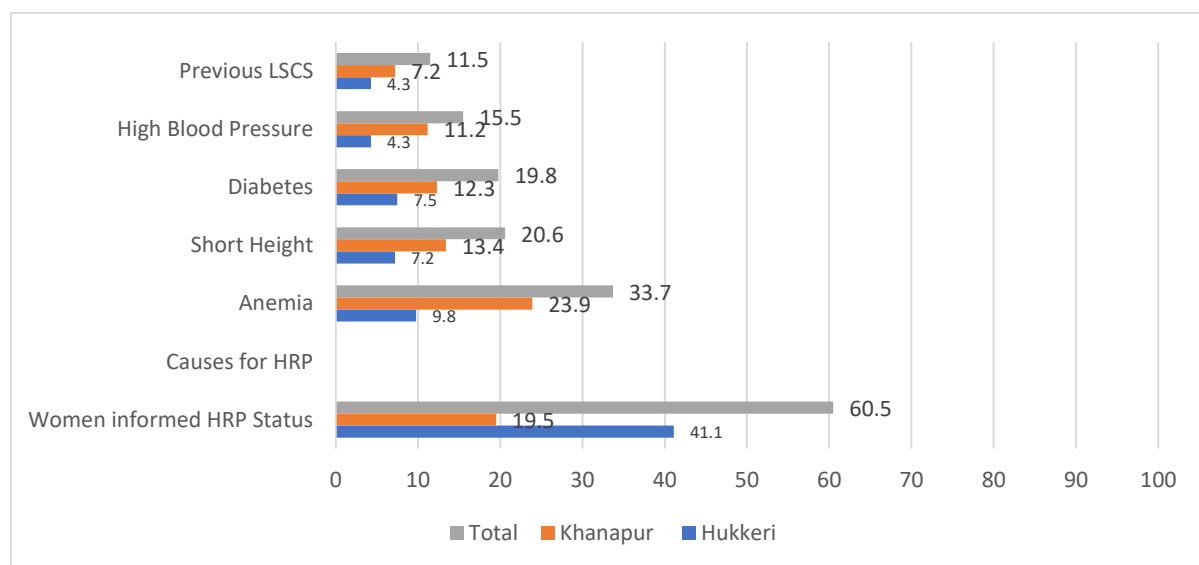


Table 4 reveals substantial differences in HRP communication by health workers between Hukkeri and Khanapur. While over 41% of women in Hukkeri were informed about their HRP status, only 19.5% in Khanapur received such communication. This indicates gaps in frontline communication, follow-up, and clinical vigilance in Khanapur's healthcare system. The leading causes of HRP across both talukas include anemia, short maternal height, and diabetes, conditions that are preventable or manageable with timely interventions. Higher proportions of these issues in Khanapur suggest that vulnerabilities remain undetected and untreated. When HRP identification fails, referral preparedness and monitoring become weak, increasing the likelihood of fatal complications. Thus, improving HRP counselling in Khanapur is essential for reducing maternal mortality.

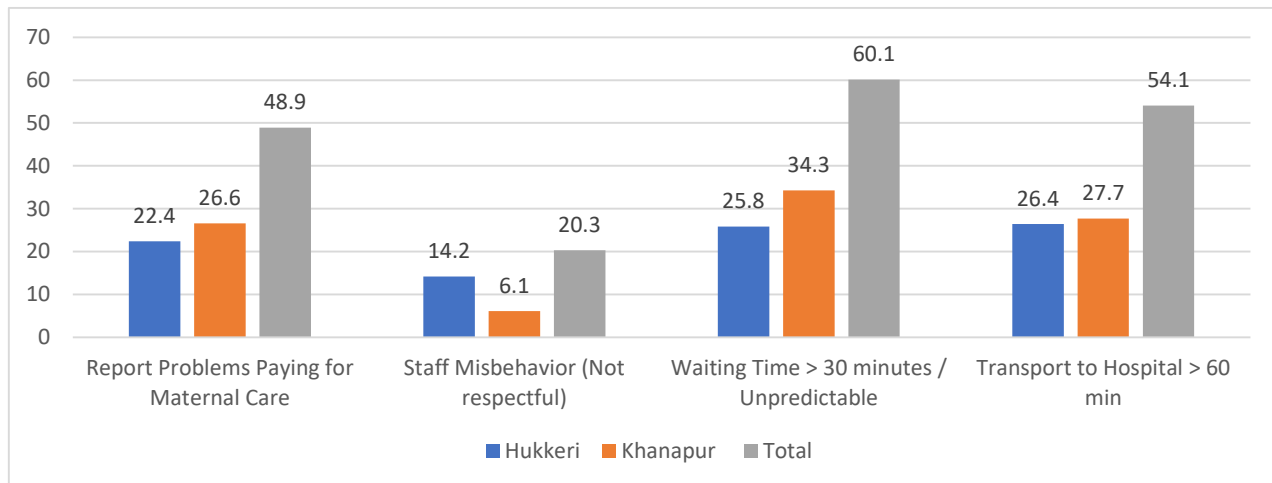
Table 5: Barriers and Quality of Maternal Healthcare by Taluka

Table 5 assesses how perceived barriers and quality of care affect maternal service utilization. Women from Khanapur report higher **financial barriers (26.6%)** compared to Hukkeri (22.4%), along with greater difficulty in accessing transport during emergencies, where travel time to reach a hospital exceeds one hour for **27.7%** of respondents (compared to **26.4%** in Hukkeri). Additionally, a larger proportion of women in Khanapur experience **unpredictable waiting times (28.2%)** at health facilities, which discourages regular follow-ups. Negative or disrespectful behavior from healthcare staff reported as **never being treated with respect by 6.1%** of women in Khanapur and **14.2%** in Hukkeri creates a sense of fear and distrust toward institutional care. These combined service-related obstacles lead to delays in both routine and emergency maternal care, particularly in Khanapur. Although Hukkeri presents relatively fewer barriers, improvements in communication, response time, and dignity-centered care remain necessary. Persistent quality gaps in Khanapur exacerbate late referrals, unmanaged complications, and reduced confidence in the health system. Hence, addressing these barriers is crucial for ensuring safe motherhood and preventing avoidable maternal deaths.

Major Findings:

The study highlights prominent socio-economic disparities between Hukkeri and Khanapur that directly influence maternal health outcomes. Women in Hukkeri benefit from better emergency transportation and greater financial security, enabling them to seek medical assistance without major delays during pregnancy complications. In contrast, women in Khanapur face financial instability and poor transport connectivity, which often results in late arrival or inability to reach health facilities during emergencies. These socio-economic constraints reveal how structural inequalities shape maternal survival and risk exposure during childbirth. Differences in antenatal care practices further reinforce this disparity. Most women in Hukkeri begin ANC visits during the third or fourth month of pregnancy, ensuring early detection of clinical risks. However, the majority of women in Khanapur initiate ANC only in the fifth month or later, reducing the effectiveness of screening for anemia, hypertension, and other high-risk conditions. Such delayed care limits opportunities for health education and preventive interventions, resulting in complications being recognized only at critical stages. The communication of High-Risk Pregnancy (HRP) status also differs substantially. Hukkeri shows a higher rate of HRP identification and counseling, while Khanapur has a significant

communication gap, leading to hidden risks and underreporting. Although anemia, short maternal height, and diabetes were common contributors to HRP in both regions, inadequate counseling in Khanapur increases maternal vulnerability. Additionally, service quality barriers such as disrespectful staff behavior, long waiting times, and financial difficulties discourage timely healthcare utilization. These compounded delays explain the paradox observed in Khanapur: **higher Maternal Mortality Ratio despite lower HRP detection**, driven by systemic failures in early screening, emergency preparedness, and quality care.

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