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ORIGINAL ARTICLE

Study of Factors Associated with Trends in Utilization of Childbirth Services in Tribal Visakhapatnam: A Mixed Method Approach

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Abstract

Background: Despite focused national efforts to improve maternal health, utilisation of institutional childbirth services remains suboptimal among tribal communities in India. Challenging terrain, limited health-system infrastructure and entrenched socio-cultural norms contribute to reduced uptake in the tribal areas of Visakhapatnam district. Objectives: To identify the facilitators and barriers influencing utilisation of childbirth services among tribal women in Visakhapatnam by assessing infrastructure, access and stakeholder perceptions. **Methods:** A triangulated mixed-methods study was conducted from November 2018 to December 2020 in two tribal Primary Health Centres (PHCs)—one good performing (GP) and one very low performing (VLP). Quantitative data on childbirth indicators were extracted from the Health Management Information System and PHC records. Qualitative data were obtained through fifteen Focus Group Discussions with tribal women and eight Key Informant Interviews with health-care providers. Thematic analysis was undertaken. **Results:** In the GP PHC, skilled birth attendance increased from 94.6% to 97.7% between 2017 and 2020, and institutional deliveries rose from 72.1% to 82%. In contrast, the VLP PHC showed lower performance (skilled attendance: 68.4% to 75.1%; institutional deliveries: 69.3% to 68.1%). Caesarean section proportions were lower in GP (0.8–1.7%) than VLP (1.1–4.7%). Major barriers identified through FGDs included poor transport connectivity, fear of hospital procedures and household responsibilities. Facilitators included Accredited Social Health Activist support, incentive schemes and ambulance availability. **Conclusion:** Strengthening infrastructure, improving transport, enhancing community engagement and supporting frontline health workers are essential to improving institutional delivery uptake among tribal populations.

Keywords: Tribal health, Institutional delivery, Maternal services, Barriers, Mixed-methods

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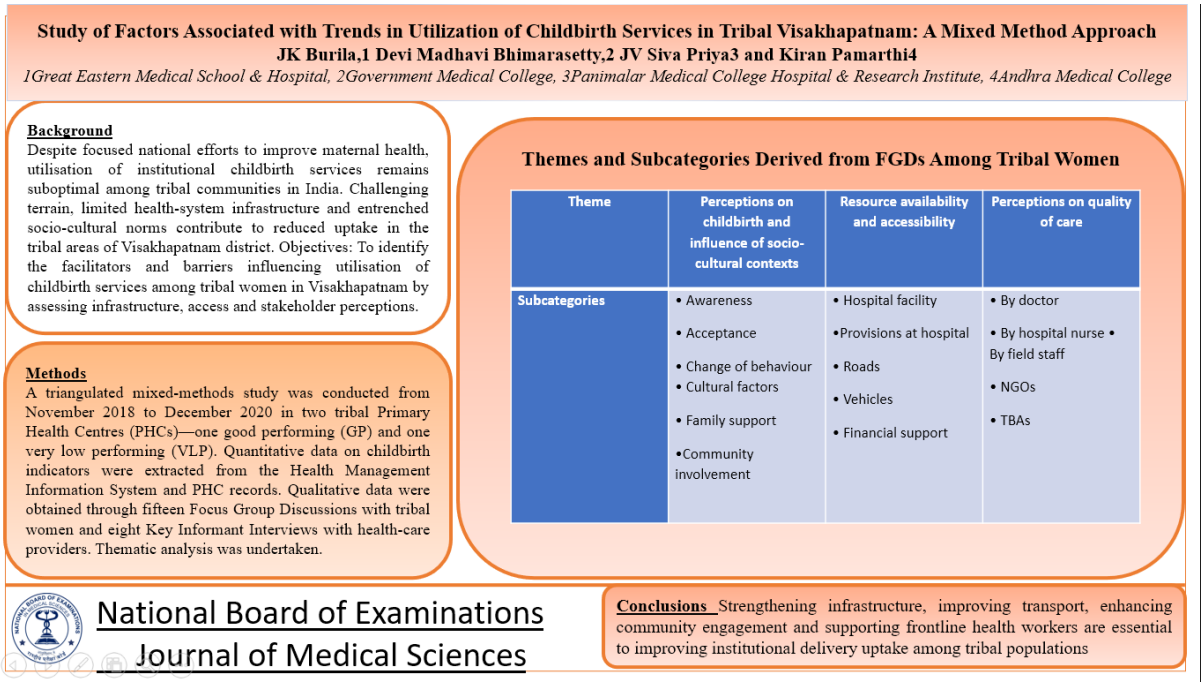
Graphical Abstract



Introduction

A nation is regarded as developed when it succeeds in safeguarding its most vulnerable populations, including pregnant women, new-borns, infants, the elderly and tribal communities [1]. The day of childbirth is the riskiest for both the mother and the new-born, with nearly 40% of new-born deaths and half of maternal deaths occurring on this single day [2]. Sustainable Development Goal (SDG) 3 emphasises the reduction of maternal, new-born and child mortality [1].

In India, the Reproductive, Maternal, New-born, Child and Adolescent Health (RMNCH+A) strategy was introduced to reduce maternal and child mortality by strengthening the health-care delivery system. As part of this initiative, the Ministry of Health and Family Welfare (MoHFW) developed a Score Card to assess and improve service delivery through routine monitoring and cross-comparison across sub-districts, districts and states [3]. Sixteen Key Performance Indicators (KPIs) are used to calculate the composite index for dashboard monitoring of Reproductive and Child Health services within the Health Management Information System (HMIS) [4]. These KPIs cover four life-cycle stages: (a) pregnancy care, (b) childbirth/delivery, (c) post-natal, maternal and new-born care and (d) pre-pregnancy/reproductive age.

Across India, a total of 1,593,534 deliveries were reported, of which 53,221 occurred in Visakhapatnam district. Among these, 6048 deliveries were reported from tribal Visakhapatnam. Of these tribal deliveries, 3901 were institutional and 2147 occurred at home. Tribal communities consistently lag behind national averages on several core public health indicators, with women and children being disproportionately affected [5,6].

The Visakhapatnam district of Andhra Pradesh has a substantial tribal

population of 6.8 lakh (14.25% of the district population) residing in 3636 habitats within agency areas. Approximately 3.75% of all deliveries in the district occur at home, and 88.9% of these are in tribal regions, with only 75% attended by skilled birth attendants [7]. Performance on key indicators is shaped by both the provision of services and the behaviours and preferences of beneficiaries [2]. Major factors limiting the utilisation of maternal health services include poverty, geographical distance, lack of information, inadequate or poor-quality services and cultural beliefs and practices [1,2]. Ensuring that every woman delivers in a health facility under the care of a skilled birth attendant is critical, particularly as nearly five million deliveries still take place at home in India annually [2].

Aim:

To identify the facilitators and barriers associated with the utilisation of childbirth services among the tribal population of Visakhapatnam and to generate insights that may strengthen programme implementation and improve service uptake.

Objectives

1. To describe the accessibility, infrastructure and manpower at the selected Primary Health Centres (PHCs).
2. To assess trends in key performance indicators of childbirth services in the selected PHCs.
3. To explore the perceptions of tribal women regarding facilitators and barriers to childbirth service utilisation.
4. To explore the perceptions of health-care providers regarding facilitators and barriers to childbirth service utilisation.

Methodology

A mixed-methods triangulated design was adopted, incorporating both qualitative and quantitative components. The qualitative arm employed Grounded Theory principles through Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). The quantitative arm utilised secondary data on selected childbirth service indicators obtained from the Health Management Information System (HMIS) through the District Medical and Health Office (DMHO), Primary Health Centres (PHCs) and linked Sub-centres.

The study was conducted in Visakhapatnam district, Andhra Pradesh, which comprises urban, rural and tribal populations. Of the total population of 4.63 million (2020), approximately 6.8 lakh (14.25%) belong to tribal communities predominantly residing in agency areas.

Study Population

The study population included tribal women of reproductive age (15–49 years) residing in selected PHC areas who had delivered within the previous five years, as well as health-care providers serving in those PHCs (Medical Officers, Auxiliary Nurse Midwives (ANMs), Accredited Social Health Activists (ASHAs) and traditional birth attendants).

Inclusion Criteria

- Tribal women who had delivered within the past five years and provided informed consent.

- Health providers working in the selected PHCs and associated Sub-centres.

Exclusion Criteria

- Women unable to comprehend the study objectives.
- Women who did not consent or were unavailable for the full duration of FGDs.

Sampling Technique

PHC Selection: All 36 tribal PHCs in the district were arranged in ascending order using the indicator institutional delivery performance against the total registered pregnancies (HMIS 16 Key Performing Indicators), data was taken from the District DMHO office Visakhapatnam. As Feasibility is the main factor and for In-depth Qualitative Research we selected one Good Performing (GP) PHC and one Very Low Performing (VLP) PHC based on Extreme case sampling technique. All Sub-centres under these PHCs were included (Figure 1).

Village and Participant Selection

From each Sub-centre, one hard-to-reach village was purposively selected, while the remaining villages were chosen through simple random sampling until data saturation was achieved. Eligible tribal women were purposively selected for FGDs. Health-care providers (Medical Officers, ANMs and ASHAs) were purposively selected for KIIs.

A total of 15 FGDs were conducted (six in the GP PHC and nine in the VLP PHC) and eight KIIs were carried out (including ASHAs, ANMs, Medical Officers and Health Extension staff from each PHC group).

Study Tools

- Semi-structured interview guides for FGDs and KIIs.
- Audio and video recording devices.
- Data collection formats for record review from PHC and Sub-centre registers.

Data Collection

Ethical approval was obtained from the Institutional Ethics Committee (IEC), King George Hospital/Andhra Medical College (66/IECAMC/OCT/2020). Permissions were taken from Integrated Tribal Development Agency (ITDA), Paderu; DMHO, Visakhapatnam; and Additional DMHO, Paderu. Written informed consent was obtained from all participants.

Secondary data relating to institutional deliveries in the selected PHCs were collected using a predesigned format. Field staff were met during review meetings for rapport building. Village-wise lists of antenatal registrations, total deliveries, institutional deliveries, home deliveries and caesarean deliveries were obtained from the MPHW(F) in the prescribed format.

Scheduled field visits were undertaken to conduct FGDs based on the feasibility of the study population and health-care staff. During field visits, a village walk-through was conducted with the assistance of the village head, and contextual observations were documented. FGDs were conducted in neutral community venues such as Anganwadi centres, schools or village secretariats as preferred by local residents. After introductions, ice-breaking activities were used to build participant comfort. A trained note-taker documented key points, and audio-video recordings were made

with participants' consent. Debriefing followed each FGD to ensure completeness.

For KIIs, purposive sampling was used to select one ASHA, one ANM, one Supervisor and one Medical Officer in the GP PHC; and one ASHA, two MPHW(F)s and one Health Extension Officer in the VLP PHC.

Data Analysis

Quantitative Component: Only descriptive analysis of Secondary data from PHCs and Sub-centres was done using Microsoft Excel to assess trends in three key performance indicators related to childbirth services, adapted from the 16 HMIS KPIs. Indicators included were Skilled Birth Attendance (SBA) delivery rate, Institutional delivery rate against antenatal registration, and Caesarean section rate as a percentage of total institutional deliveries.

Qualitative Component: Personal identifiers were removed, and audio files were anonymised. Both deductive and inductive approaches were employed. Grounded theory principles were used for general observations and to guide the recording of present study findings. Thematic analysis was mainly applied to data obtained from Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). The deductive approach was guided by the primary aim of exploring facilitators and barriers to institutional deliveries. Coding was independently done by two investigators and subsequently reviewed and jointly summarised by all three investigators to ensure reliability and consistency. Codes were tested on a subset of interviews, refined and organised into broader conceptual categories. Space was maintained for emergent themes reflecting inductive insights.

Thematic analysis was conducted to identify relationships across categories and participant types, enhancing internal validity. Regular discussions among investigators ensured consensus on coding and theme development. Data saturation was considered when no new themes or information emerged after two consecutive FGD's/ Interviews. The final themes reflected the major facilitators and barriers influencing institutional deliveries among tribal women and health-care providers.

Results

Characteristics of the Selected Primary Health Centres

Substantial differences were observed between the two selected Primary Health Centres (PHCs)—the Good Performing (GP) PHC and the Very Low Performing (VLP) PHC—particularly in relation to their geographical setting and service environment. The GP PHC was located in a scheduled tribal area, whereas the VLP PHC catered to a non-scheduled tribal population. The GP PHC was situated in predominantly hilly terrain with multiple water crossings, while the VLP PHC covered both hilly and plain areas, similarly characterised by several water streams. Road connectivity was notably better for the GP PHC, located along the main route between two major tribal towns, whereas the VLP PHC was positioned along a loop line with poor road access.

Distances to higher-level health facilities also varied distinctly. The GP PHC was 140 km from the district headquarters, 25 km from the nearest secondary-level care centre and 140 km from the tertiary care hospital. In

comparison, the VLP PHC was 90 km from the district headquarters, 65 km from the nearest secondary-level facility (including an additional 25 km to the neighbouring district's Community Health Centre) and 90 km from the tertiary hospital.

Both PHCs functioned as 24×7 facilities, with buildings and labour rooms in good working condition. Each centre had six inpatient beds and maintained functional laboratory services, a pharmacy and an ambulance. Staff quarters were absent in both facilities. The GP PHC was established in 1976, whereas the VLP PHC became operational in 2010.

Human resource availability was similar across PHCs, with each having two Medical Officers, four staff nurses, one pharmacist and one laboratory technician. The GP PHC additionally had one Community Health Officer (CHO), which was not available in the VLP PHC. Regarding multipurpose health supervisors, the GP PHC had two male and two female MPHS staff, while the VLP PHC had one male and two female MPHS personnel. Both PHCs had one MPHEO/PHN.

Field-level staffing corresponded with population coverage. The GP PHC serviced a population of 16,265 with five Sub-centres, seven MPHW(F) staff, 79 villages and 78 ASHAs. The VLP PHC covered a population of 11,449, with an equal number of Sub-centres and MPHW(F) staff, while covering 82 villages supported by 79 ASHAs.

Trends in Key Performance Indicators of Childbirth Services

Over the three-year period from 2017–18 to 2019–20, both PHCs exhibited consistent service utilisation patterns, although notable differences existed between the two centres. Antenatal registrations at the GP PHC declined from 467 in 2017–18 to 423 in 2019–20, with a similar decline observed at the VLP PHC from 370 to 342.

Total deliveries at the GP PHC remained stable (347–355), whereas the VLP PHC showed a slight decline (314–310). Institutional deliveries at the GP PHC increased modestly from 334 to 347 over the three years, while the VLP PHC demonstrated a moderate rise from 215 to 233. Home deliveries showed a decreasing trend in both PHCs. The GP PHC recorded a reduction from 19 to 8 home deliveries, while the VLP PHC saw a larger drop from 99 to 77. Caesarean section numbers rose gradually in both centres, from 3 to 6 at the GP PHC and from 4 to 11 at the VLP PHC.

Key performance indicators indicated stronger outcomes at the GP PHC than at the VLP PHC. Deliveries conducted by skilled birth attendants exceeded 94% consistently at the GP PHC, increasing from 94.6% to 97.7% between 2017–18 and 2019–20. In contrast, the VLP PHC recorded substantially lower figures, rising gradually from 68.4% to 75.1%. The proportion of institutional deliveries against antenatal registrations increased at the GP PHC from 72.1% to 82%, whereas the VLP PHC displayed fluctuating and declining values from 69.3% to 68.1%.

Caesarean sections remained low in both centres but displayed divergent patterns. While the GP PHC showed a modest rise from 0.8% to 1.7%, the VLP PHC demonstrated a sharper increase from 1.1% to 4.7%.

A. Thematic Analysis of Focus Group Discussions Among Tribal Women

Three principal themes emerged from the FGDs (Table 1)

1. Perceptions on childbirth and socio-cultural influences
2. Resource availability and accessibility
3. Perceptions on quality of care

Table 1. Themes and Subcategories Derived from FGDs Among Tribal Women

Theme	**Perceptions on childbirth and influence of socio-cultural contexts**	**Resource availability and accessibility**	**Perceptions on quality of care**
Subcategories	• Awareness • Acceptance • Change of behaviour • Cultural factors • Family support •Community involvement	• Hospital facility •Provisions at hospital • Roads • Vehicles • Financial support	• By doctor • By hospital nurse • By field staff • NGOs • TBAs

Codes identified during analysis were categorised into subdomains that functioned as either facilitators or barriers from the participants' perspectives.

1. Facilitators and Barriers Related to Socio-cultural Influences (Table 2)

Representative paraphrased quotations included:

- "They will take care of delivery at the hospital; injections are given." (FGD-W1)
- "At home delivery happens — nothing happened before." (FGD-W3)
- "Only after pains, we go to hospital." (FGD-W5)
- "If the baby does not come out, there is danger to both mother and baby." (FGD-W2)
- "Some elders deliver at home; younger people go to hospital." (FGD-W6)

2. Resource Accessibility and Availability (Table 3)

Representative paraphrased quotations included

- "Hospital has come and it is nearby, so we went for delivery." (FGD-W7)
- "If we go to a hospital nearby, they say it is not your PHC and do not treat us well." (FGD-W9)
- "For any issue, we have to walk 20 km — that is why we deliver at home." (FGD-W4)
- "Roads are bad; water streams overflow when it rains." (FGD-W8)
- "Money will be credited to bank accounts for hospital delivery." (FGD-W2)
- "If we miss a day in the field, monkeys eat the crop." (FGD-W11)

3. Perceptions on Quality of Care (Table 4)

Representative paraphrased quotations included:

- "Now the new doctor is not attending us like the previous doctor." (FGD-W12)
- "Hospitals do not receive us well; staff may abuse during delivery — this makes us prefer home." (FGD-W10)

- "ASHA and ANM ask us to admit early." (FGD-W14)
- "No ASHA in our village — we do not know whom to talk to." (FGD-W13)

B. Thematic Analysis of Focus Group Discussions Among Tribal Women (Table 5).

Table 2. Facilitators and Barriers Related to Socio-cultural Influences

Subcategories	Facilitators (codes)	Barriers (codes)
Awareness	• Hospital is safe. • Fear of home deliveries • Education • Selection of hospital • Awareness about complications • Move to hospital when pain starts.	• No harm for home delivery • Home delivery is easy • Fear of cutting and kidney removal in hospital • Go to hospital only after labour pains start.
Acceptance	• Better to go for hospital delivery with regular food • Hospital delivery is usual practice in changing times	• Unable to stay at hospital.
Family support	• Mothers suggest hospital delivery	• Require person to cook and care for children at home • Pressure from in-laws and husband for home delivery
Community involvement	• Youth help for emergency transport	—
Cultural factors	—	• Drinking of homemade liquor
Change of behaviour	• Prior admission for delivery • Stopped alcohol	—

Table 3. Facilitators and Barriers in Resource Accessibility and Availability

Subcategory	Facilitators	Barriers
Hospital facility	• Availability • Nearby location	• Poor facilities • Private hospital costly • Very far
Roads	• Road point • Good roads	• No roads • Water streams • Poor roads
Vehicles	• Ambulance picks up and drops • Own arrangement of	• Lack of transport

	autorickshaw/two-wheeler	
Financial support	• Free of cost • Money benefit for hospital delivery	• Preference for agriculture over hospital delivery
Provisions at hospital	• Vaccines given • Food supply • Baby kits	• Food provision only for patient, not for family members • No traditional food at hospital

Table 4. Facilitators and Barriers in Perceptions on Quality of Care

Subcategory	Facilitators	Barriers
By doctor	• Complications managed • Prompt services	• Not available • Irregular • Poor care
By hospital nurse	• Conduct delivery	• Abuse at delivery
By field staff	• Motivation by Accredited Social Health Activist (ASHA) • Follow-up after delivery by ASHA and Auxiliary Nurse Midwife (ANM) • Advice from ASHA	• No ASHA • No one to advise
NGO's	• NGO Manasa • NGO Aasara	—
TBA's	• ASHAs are earlier Traditional Birth Attendants (TBAs)	—

Table 5. Thematic Analysis of KIIs

Category	Community-related	Accessibility	Health system-related
Facilitators	• Preferring hospital deliveries • Education • Family support	• Local youth help in emergency transport	• Work recognition • Counselling by health workers • Supervision • Incentives • Quality of care • Dedicated staff • Good leadership
Barriers	• Consumption of homemade liquor • Illiteracy • Inability to track	• Lack of transport • Poor network connectivity	• Financial burden on Accredited Social Health Activist (ASHA) • Lack of periodic trainings •

	menstruation • Multigravida status • Lack of family support • Poverty • No bank accounts	• Water streams • Distant Primary Health Centre (PHC) • Hilly terrain	Illiteracy among ASHAs • No family planning services • Stress due to reporting workload • Inadequate funds • Over-reporting of institutional deliveries • Escapism from work

Themes were categorised into community-related, accessibility-related and health-system-related facilitators and barriers. Findings mirrored those from FGDs, highlighting intersecting socio-cultural, infrastructural and systemic challenges influencing institutional delivery.

Discussion

In tribal areas, difficult terrain and sparsely populated habitations result in Primary Health Centres (PHCs) serving populations lower than the Indian Public Health Standards (IPHS) norm of 20,000. Both PHCs included in this study catered to populations below this threshold, likely due to administrative reorganisation undertaken to improve service delivery. Despite this, both PHCs met IPHS requirements for Maternal and Child Health (MCH) services and functioned as 24-hour delivery facilities with newborn care services. Availability of round-the-clock delivery care is known to enhance institutional deliveries and subsequently reduce maternal mortality.

Although both PHCs were equipped with labour rooms, pharmacies, operation theatres, laboratories and ambulance services, utilisation differed markedly. The good-performing (GP) PHC demonstrated substantial outpatient turnover, whereas the very low-performing (VLP) PHC had minimal utilisation. Locational differences may explain this contrast; GP PHC was situated on a main transit route, whereas VLP PHC lay on a loop line with limited oversight by supervisory teams. Absence of residential staff quarters at both facilities may further impede 24/7 service provision due to long-distance travel by health workers.

Perceptions on Childbirth and Socio-cultural Influences

This study aligns with existing literature indicating that women's autonomy in deciding the place of delivery remains limited. Cephas Sialubanje et al. reported that husbands and elder family members hold predominant decision-making power [8], a barrier similarly reflected in this study where in-laws and husbands encouraged home births. However, maternal support for hospital delivery emerged as a facilitating factor, reflecting intergenerational shifts in attitudes. Consistent with Tina Miller et al. [9], traditional norms and resistance to behavioural change hindered institutional delivery. Yet, community involvement and evolving social norms helped to reposition hospital deliveries as acceptable. Traditional postpartum practices—such as consumption of customary foods—previously noted as barriers, were less influential in the present study, with many women adapting to hospital food. Mosley et al. highlighted the dual roles of

Traditional Birth Attendants (TBAs)—publicly endorsing hospital births but conducting home deliveries—and the resulting trust deficits [10]. Similar patterns emerged here, where TBAs' continued involvement in home births and dominant family influence contributed to persistent hesitancy. In contrast to Sana Q. Contractor (2018), who found that women viewed childbirth as a natural process unless complications occurred [11], participants in the current study showed greater awareness of hospital safety, although myths such as fears of organ removal persisted. A shift towards institutional delivery, noted by Kristi Sidney (2016) [12], was also evident, though some participants still perceived home births as easier and more convenient.

Resource Availability and Accessibility

Barriers related to transport, distance and time were consistent with findings from Onouma Thummapol et al., who described geographic and logistical constraints in similar settings [13]. This study corroborated these challenges while also identifying facilitators such as proximity to hospitals, free services, financial incentives and ambulance services. Distance-related barriers documented by Sana Q. Contractor [11] were mirrored here. Opportunity costs associated with agriculture—also noted by Kristi Sidney [12]—influenced decisions to forgo hospital delivery despite incentives. While system-level financial protection efforts have been described [11], practical concerns persisted locally, including lack of food for attendants and absence of culturally familiar foods in hospital settings. Nonetheless, availability of vaccines, hospital food supply and baby care kits served as facilitators.

Perceptions of Quality of Care

Consistent with previous research, participants highlighted concerns regarding staffing irregularities, low perceived quality of care and discriminatory or disrespectful treatment in facilities (8,11,10,12,13). At the same time, the ability of hospitals to manage complications and provide prompt care functioned as strong facilitators. Irregular availability of doctors, hostile behaviour from staff and negative past experiences—findings consistent with earlier studies—contributed to mistrust and reluctance to seek institutional care.

Overall Implications

This study assessed PHC performance on key childbirth indicators and explored the underlying factors shaping institutional delivery among tribal populations. A clear performance gap was observed, with institutional delivery coverage significantly lower in the VLP PHC. Although this PHC reported a higher proportion of caesarean deliveries, indicating readiness for referral, overall utilisation remained inadequate.

The thematic analysis identified multifactorial barriers including sociocultural norms, transport limitations, financial constraints and health system challenges. Addressing these requires improving quality of care, strengthening transport infrastructure, ensuring adequate manpower and incorporating culturally sensitive practices. It is also essential to address the concerns of Accredited Social Health Activists (ASHAs) and other healthcare providers.

Facilitating factors such as strong community involvement, volunteer support and engagement of non-profit organisations represent valuable

opportunities. Leveraging these community-based assets and scaling supportive mechanisms can significantly enhance the reach and effectiveness of maternal and child health services.

Despite the comparable infrastructure and manpower, the most important factors which contributed for this difference in utilisation were accessibility, road connectivity, geographical location with GP – PHC located in the main transit while LP- PHC located in corner loop with seasonal streams disturbing the access to services. In addition, the involvement of medical officer and supportive staff active involvement has increased the service uptake. These factors collectively played a crucial role in this difference between utilisations patterns beyond the availability of infrastructure.

Generalisability and Limitations

This study was exploratory in nature, and we focussed on understanding the factors that contributes to performance in two different tribal PHC's. The findings are not intended for statistical generalisability. The results are context specific and is completely restricted to the characteristics in that study population. If we understand the factors responsible, we can apply that knowledge in others Tribal PHC's with similar contextual settings particularly in terms of terrain, accessibility, and community dynamics. Thus, direct generalisation is limited and study offers programmatic insights that can inform us of interventions in comparable settings.

Conclusion

This study identified significant gaps in the utilisation of institutional childbirth services between the two selected Primary Health Centres in the tribal regions of Visakhapatnam. While the good-performing PHC showed consistent improvement in key performance indicators, the very low-performing PHC continued to demonstrate suboptimal utilisation despite comparable infrastructure and manpower. Multiple interlinked barriers—including socio-cultural influences, transport challenges, financial constraints and limitations within the health system—continue to restrict access to safe childbirth services. Strengthening the quality of care, improving transport and communication networks, ensuring availability of trained and motivated healthcare personnel and integrating culturally sensitive practices are essential to increasing institutional deliveries. Addressing concerns raised by Accredited Social Health Activists and healthcare providers will further enhance service delivery. Importantly, leveraging existing facilitating factors such as community participation, volunteer networks and the involvement of non-governmental organisations offers a promising pathway to improve maternal and newborn health outcomes in tribal communities.

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Conflicts of interest

The authors declare that they do not have conflict of interest.

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No funding was received for conducting this study.

Informed Consent

Written informed consent was obtained from all study participants before data collection.

Ethical Approval

Ethical approval for this study was obtained from the Institutional Ethics Committee, Andhra Medical College, Visakhapatnam (Approval No: 66/IECAMC /OCT/2020). All procedures performed were in accordance with institutional guidelines and the Declaration of Helsinki.

References

1. World Health Organization. Global action for skilled attendants for pregnant women. Geneva: WHO; 2019. Available from: http://www.who.int/maternal_child_adolescent/documents/who_fch_rhr_0203/en/
2. UNICEF India. Health. 2021. Available from: https://www.unicef.org/india/what-we-do/health
3. National Health Mission. RMNCH+A: Reproductive, Maternal, Newborn, Child and Adolescent Health. 2021. Available from: https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=794&lid=168
4. Government of Odisha, National Health Mission. 16 Dashboard Analysis: Composite Index Methodology. Bhubaneswar: NHM Odisha; 2024 Feb. Available from: https://nhmodisha.gov.in/wp-content/uploads/2024/02/16-DASHBOARD-ANALYSIS.pdf
5. World Health Organization. Maternal mortality: fact sheet. 2021. Available from: https://www.who.int/news-room/fact-sheets/detail/maternal-mortality
6. Ministry of Health and Family Welfare. Reproductive Child Health (RCH) Dashboard. Government of India; 2021. Available from: https://rchrpt.nhm.gov.in/RCHRPT/Dashboard/PortalDashboard.aspx
7. Census of India. Search Details: Population Census Data. 2021. Available from: https://www.censusindia.gov.in/pca/SearchDetails.aspx?Id=659707
8. Sialubanje C, Massar K, Hamer DH, Ruiter RAC. Reasons for home delivery and use of traditional birth attendants in rural Zambia: a qualitative study. BMC Pregnancy

Childbirth. 2015;15(1):216. doi:10.1186/s12884-015-0652-7.

9. Miller T, Smith H. Establishing partnership with traditional birth attendants for improved maternal and newborn health: a review of factors influencing implementation. BMC Pregnancy Childbirth. 2017;17(1):365. doi:10.1186/s12884-017-1534-y.
10. Mosley PD, Saruni K, Lenga B. Factors influencing adoption of facility-assisted delivery: a qualitative study of women and stakeholders in a Maasai community in Tanzania. BMC Pregnancy Childbirth. 2020;20(1):100. doi:10.1186/s12884-020-2728-2
11. Contractor SQ, Das A, Dasgupta J, van Belle S. Beyond the template: the needs of tribal women and their experiences with maternity services in Odisha, India. Int J Equity Health. 2018;17(1):130. doi:10.1186/s12939-018-0850-9.
12. Sidney K, Tolhurst R, Jehan K, Diwan V, De Costa A. "The money is important but all women anyway go to hospital for childbirth nowadays": a qualitative exploration of participation in a conditional cash transfer program in Madhya Pradesh, India. BMC Pregnancy Childbirth. 2016;16(1):47. doi:10.1186/s12884-016-0834-y.
13. Thummapol O, Barton S, Park T. Healthcare access experiences among indigenous women in northern rural Thailand: a focused ethnographic study. Cent Asian J Glob Health. 2018;7(1):328. doi:10.5195/cajgh.2018.328.