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Maternal and Child Health Challenges Insights from Upper and Lower Bonda Communities in Malkangiri Dist. of Odisha, India

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Abstract

The Bonda tribe of Odisha, classified among India's Particularly Vulnerable Tribal Groups (PVTGs), faces severe reproductive and child health challenges despite government interventions. The present study examines the reproductive and child health status and health-seeking behaviour among the Bonda tribe. Using a mixed-method approach, data were collected from six villages in Malkangiri district, comparing health indicators between Upper and Lower Bonda communities. Findings reveal alarmingly high rates of early marriage (44% in Upper Bonda and 33% in Lower Bonda among females aged 15-19), adolescent pregnancies (nearly 18%), maternal mortality (11% in Upper Bonda), infant mortality (111 per 1000 in Upper Bonda), and child malnutrition (53% fully immunized in Upper Bonda vs. 76% in Lower Bonda). Despite government interventions, access to antenatal care (27% in Upper Bonda with four or more visits), institutional deliveries (36% in Upper Bonda), and modern healthcare services remains inadequate, with a significant reliance on traditional practices. The study underscores the urgent need for culturally sensitive health interventions, improved healthcare infrastructure, and educational initiatives tailored to the unique context of the Bonda tribe.

Keywords: Bonda tribe, maternal health, child health, reproductive health, Odisha, vulnerable tribal group, healthcare behaviour

1. Introduction

The Bonda tribe, one of the 13 Particularly Vulnerable Tribal Groups (PVTGs) in Odisha, has shown a steady increase in population, from 2,565 in 1941 to 12,231 in 2011, accounting for 0.128% of the state's total Scheduled Tribe (ST) population. Predominantly residing in rural areas (96.85%), the tribe has a higher female population, including in the 0–6 age group. Literacy rates among the Bonda people have fluctuated, from 2.1% in 1961 to 28.45% in 2011, with male literacy (35%) remaining higher than female literacy (22.8%). The work participation rate declined from 54.6% in 2001 to 49.1% in 2011, with main workers decreasing and marginal workers increasing, particularly among women. Various government initiatives have had limited impact on their socio-economic conditions (Ota & Mohanty, 2007; SCSTRTI, 2011–12).

Reproductive and child health (RCH) among tribal women remains a critical concern. High anemia rates among tribal mothers, inadequate nutrition for girls, and adolescent pregnancies contribute to significant

health risks. Around 70–80% of adolescent tribal girls suffer from anemia, increasing complications such as early pregnancies and sexually transmitted infections (STIs), including HIV/AIDS. Educationally disadvantaged girls are particularly vulnerable. Despite governmental and non-governmental interventions, maternal mortality, low birth weight, and perinatal deaths remain high due to malnutrition, gender discrimination, and lack of antenatal care. The WHO recommends at least four antenatal visits, but poverty and illiteracy hinder access to healthcare. Proper breastfeeding and colostrum intake are essential for infant health, yet malnutrition persists due to inadequate healthcare infrastructure (Ota & Mohanty, 2015).

Recognizing these challenges, the Odisha government established the Bonda Development Agency (BDA) at Mudulipada in Khairput block, Malkangiri district, covering 32 villages across 130 sq. km. The BDA facilitates development programs, but the Bonda community continues to struggle with health, education, and economic barriers. Addressing these issues requires an integrated approach combining modern healthcare with indigenous knowledge, improving educational access, and strengthening healthcare infrastructure (SCSTRTI, 2011–12).

The present study is planned with the following objectives:

1. To examine the reproductive and child health status among the Bonda tribe, with a focus on key indicators such as fertility, maternal care, infant, and child mortality.
2. To compare health-seeking behaviours and healthcare access between Upper and Lower Bonda communities.

2. Methodology

2.1 Study Area

Malkangiri district in Odisha is home to several tribal groups, including the PVTG Bondas. The district has a total population of 612,727 (Male: 303,913, Female: 308,814), with 57.87% ST and 22.57% SC populations. About 93.23% of households are rural and tribal. The Bonda population is 12,231 (2011 Census), with 11,846 in rural areas and 385 in urban areas. The study focuses on three upper Bonda villages (Dumuripada, Bandhaguda, Badapada) and three lower Bonda villages (Khuriguda, Kadamguda, Semiliguda) in Khairaput block.

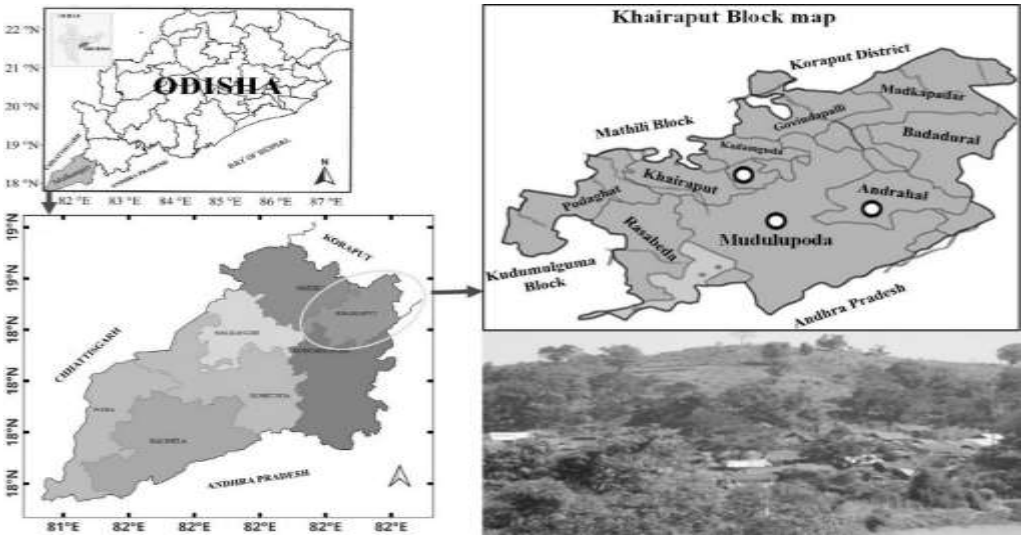

Figure 1: Study area map showing Khairaput block of Malkanagiri district of Odisha

2.2 Research Design

The present study adopted a mixed-method approach, employing both quantitative and qualitative techniques to examine reproductive and child health and healthcare practices among the Bonda tribe.

Primary data were collected through structured household surveys, interviews, and focus group discussions with women aged 15-49 years, pregnant and lactating mothers, and community health workers such as Anganwadi workers, ASHA workers, and auxiliary nurse midwives (ANMs). A total of 618 Households were selected, using simple random research design, based on reproductive status and nutritional vulnerability. Quantitative data were analyzed using descriptive statistics, including percentages and rates, while qualitative narratives provided context on indigenous practices, health beliefs, and care-seeking behaviour.

Secondary data were sourced from the Census of India (2001 and 2011), National Family Health Survey-4 (2015-16), UNICEF and WHO publications, and relevant government documents. These sources provided comparative benchmarks for fertility, mortality, maternal health indicators, and child nutrition status at the district, state, and national levels.

3. Results and discussion

In both Upper and Lower Bonda villages, people rely on streams, tube wells, and pits for drinking water, while poor sanitation and open defecation contribute to malaria, diarrhea, scabies, and pneumonia. Healthcare access is minimal, with traditional healers as primary providers. Malnutrition and infant mortality remain high, and literacy rates are significantly lower than district, state, and national averages. The sex ratio in Upper Bonda villages aligns with Malkangiri's 925 females per 1,000 males (NFHS-4, 2015-16), influenced by the bride price system (SCSTRTI, 2011–12).

3.1 Crude Birth and Death Rate

The Crude Birth Rate (CBR) for the Bonda tribe is higher than the district, state, and national averages, with upper Bonda at 28 and lower Bonda at 32. Similarly, the Crude Death Rate (CDR) is also higher, with upper Bonda at 16 and lower Bonda at 12. In Odisha, the CDR for males is 8.5 and for females is 7.1. The natural increase rate for upper Bonda is 23, while for lower Bonda, it is 33.

3.3 Fertility and Age at Marriage

Early marriage is prevalent in the Bonda tribe, leading to high-risk pregnancies and increased childhood mortality (Soltani et al.,2017). Among females aged 15-19, 44% in upper Bonda and 33% in lower Bonda are married. In the 20-24 age group, 22% of upper Bonda and 25% of lower Bonda females are married. Similarly, the highest percentage of married males in upper Bonda falls in the 15-19 age group, whereas in lower Bonda, it is in the 20-24 age group. The Neonatal Mortality Rate (NN) for the Bonda tribe is 35.5, and the Post-Neonatal Mortality Rate (PNN) is 16.3, both significantly higher than the Odisha state values of NN (28.4) and PNN (11.6).

3.4 Fertility Levels

The Total Fertility Rate (TFR) in Odisha is 2.1, while for the Scheduled Tribe (ST) population, it is 2.46. NFHS-4 indicates that TFR decreased by 0.3 from NFHS-3 (2005-06) to NFHS-4 (2015-16). Given the Bonda tribe's low literacy rate, a higher TFR is expected (Swain M,2014; Swain M & Nayak D,2015).

3.5 Pregnancy and Pregnancy Outcomes

Pregnant and lactating mothers in upper Bonda are 26 and 30, respectively, while in lower Bonda, they are 27 and 28. The percentage of pregnant and lactating mothers in upper and lower Bonda is 17.9% and 18.5%, nearly double the teenage pregnancy rate in Odisha (8%). The pregnancy outcome for Odisha shows live births at 87.7%, abortions at 4.7%, miscarriages at 7%, and stillbirths at 0.7%. In comparison,

ST figures are 90.8%, 2.8%, 5.7%, and 0.8%, respectively. The high rate of early marriage, low literacy, and poverty contribute to these outcomes.

3.6 Family Planning

The contraceptive prevalence rate (CPR) in Malkangiri is 52%, while NFHS-4 reports it at 57% for currently married women (15-49 years). Family planning awareness is low among the Bonda tribe, with 66% of upper Bonda and 30% of lower Bonda unaware of contraceptive methods. Female sterilization is only 4% in upper Bonda and 24% in lower Bonda, much lower than the district (29.9%) and state (32.6%). Pills are the most common method, used by 10% in upper Bonda and 22% in lower Bonda. Traditional contraception includes tying the white oleander root to the waist and consuming ginger juice for abortion. The unmet need for family planning in Malkangiri is 11.9%, yet no unmet need was found among the Bonda women during field surveys.

3.7 Infant and Child Mortality

Infant Mortality Rate (IMR) is alarmingly high in upper Bonda (111) and lower Bonda (71), compared to the district (55), state (49), and country (39). NFHS-4 indicates IMR is higher for teenage mothers (43 per 1,000 live births) and mothers aged 30-39 (53 per 1,000), compared to mothers aged 20-29 (36 per 1,000). The Under-5 Mortality Rate (U5MR) is also high, at 83 in upper Bonda and 71 in lower Bonda, compared to the state (48) and the country (50). The neonatal mortality rate (NN) in Odisha is 28.4, but it is 35.5 among the Bonda tribe. The post-neonatal mortality rate (PNN) is 16.3 for Bonda, while the state average is 11.6.

3.8 Reproductive and Child Health (RCH)

During pregnancy, Bonda women reduce food intake due to the belief that a smaller baby makes childbirth easier. Nutritional intake of iron, calcium, and vitamins is poor, and alcohol consumption during pregnancy is common. Most deliveries occur at home, attended by elderly women, with no proper medical precautions, leading to high maternal and infant mortality.

3.9 Maternal Mortality Ratio (MMR)

India's MMR decreased from 370 in 2000 to 145 in 2017, with an annual reduction rate of 5.5%. Due to a small sample size, MMR for the Bonda tribe could not be computed. However, maternal deaths recorded in upper Bonda were 4 out of 36 live births, and in lower Bonda, 2 out of 42 live births. The lack of proper maternal healthcare services remains a critical issue in the Bonda tribe (UNIGME,2018).

3.10 Antenatal Care

In Upper Bonda, only 27% of pregnant women had four or more antenatal care visits, whereas the percentage is higher in Lower Bonda at 44%. These figures are significantly lower compared to the district (69%) and state (62%). Odisha has witnessed an increase in antenatal care in the last ten years (NFHS-4), but the Bonda tribe, particularly in the inaccessible Bonda hills, remains underserved. Regarding iron and folic acid (IFA) tablet consumption, only 12% of Upper Bonda women and 19% of Lower Bonda women took them. However, 69% of Upper Bonda and 78% of Lower Bonda women received at least one tetanus toxoid (TT) injection. The overall antenatal care situation in Bonda tribe is poor, with Upper Bonda women being more vulnerable compared to Lower Bonda.

3.11 Delivery Care

In Odisha, 85% of deliveries occur in health institutions, while 14% take place at home (NFHS-4). However, among the Bonda tribe, the reverse trend is observed. Institutional deliveries account for only 36% in Upper Bonda and 45% in Lower Bonda, whereas home deliveries remain high at 64% and 55%, respectively. The Bonda community follows indigenous childbirth practices, including herbal remedies and

religious rituals performed by a Dishari. In Upper Bonda villages, no women received financial assistance under the Janani Surakhya Yojana (JSY) due to poor accessibility, whereas some women in Lower Bonda availed this benefit. The average out-of-pocket expenditure (OOPE) in Malkangiri district is ₹1,454, the lowest in Odisha (NFHS-4).

3.12 Postnatal Care

Statewide, 85% of mothers receive a postnatal checkup after birth, and 79% have a checkup within two days. Among institutional births, 82% in public hospitals and 89% in private hospitals receive postnatal care within two days, while only 50% of home births do. In Bonda villages, most births occur at home, resulting in a lack of postnatal check-ups for new mothers. Child Health

3.13 Breastfeeding and Vaccination:

Only 36% of Upper Bonda and 57% of Lower Bonda children are given colostrum. The community has limited awareness of proper breastfeeding practices, although extended breastfeeding for 2-3 years is common. Early introduction of other foods before six months is frequently observed. Certain indigenous practices, such as consuming papaya or burnt earthworm powder to enhance breast milk, are followed. To treat childhood ailments like diarrhea, remedies using jamun leaves and goat milk are used. 53% of Upper Bonda and 76% of Lower Bonda children are fully immunized under the National Rural Health Mission (NRHM) (UNICEF,2019; WHO,2003).

3.14 Childhood Illness:

A high percentage of Bonda children (78% in Upper Bonda and 86% in Lower Bonda) do not suffer from diseases. However, scabies is common due to unhygienic living conditions, and disease burden is higher among Upper Bonda children.

Malnutrition:

Malnutrition rates are significantly higher in Upper Bonda than Lower Bonda. Children under 3 years show a higher prevalence of malnutrition compared to those aged 3-6 years. A large proportion of children fall into the yellow zone (at risk) and red zone (acutely malnourished) categories, indicating poor maternal and child nutrition.

3.14 Bonda Tribe and COVID-19

The COVID-19 pandemic severely impacted the Bonda community, leading to loss of livelihoods due to lockdowns. Reverse migration worsened their socio-economic conditions. Essential healthcare services like Supplementary Nutrition Program (SNP), Take Home Ration (THR), Hot Cooked Meals (HCM), antenatal and postnatal check-ups, and preschool education were disrupted.

During the first wave, six COVID-19 cases were reported in Upper Bonda and two cases in Lower Bonda. Two quarantine centers were set up at Mudulipada and Badbel villages. In the second wave, 12 COVID-19 cases were detected in Bonda Hill, leading to its declaration as a containment zone (The Hindu, 17 & 23 May 2021). However, quarantine measures were ineffective due to the community's close-knit living arrangements. Institutional quarantine and better medical facilities were suggested to reduce their vulnerability.

Table 1: Status of Bonda tribe with reference to total scheduled tribe population in Odisha. Data source: Census of India, 2001 & 2011

Items	Bonda population in 2001 and 2011 (within bracket)			% of total scheduled tribe population of Odisha in 2011		
	Total	Rural	Urban	Total	Rural	Urban
No. of household	2,996	2,885	111	0.134	0.138	0.077
Total Population	**12,231**(9,378)	**11,846**(9,244)	**385**(134)	**0.128**	**0.132**	**0.065**
Male	5,669(4,598)	5,459(4,492)	210(106)	0.120	0.123	0.070
Female	6,562(4,780)	6,387(4,752)	175(28)	0.135	0.140	0.059
Population(0-6years)	**2,706**(1,629)	**2,672**(1,614)	**34**(15)	**0.178**	**0.185**	**0.043**
Male	1,321(819)	1,302(808)	19(11)	0.172	0.179	0.047
Female	1,385(810)	1,370(806)	15(4)	0.184	0.192	0.270
Total literate	**3,478**(1,138)	**3,197(258)**	**281(39)**	**0.083**	**0.083**	**0.079**
Male	1,985(880)	1,807(250)	178(31)	0.079	0.078	0.088
Female	1,493(258)	1,390(8)	103(8)	0.088	0.090	0.066
Total workers	**6,000**(5,116)	**5,894(5064)**	**106(52)**	**0.126**	**0.130**	**0.048**
Male	2,824(2,505)	2,758(2,457)	66(48)	0.107	0.111	0.044
Female	3,176(2,611)	3,136(2,607)	40(4)	0.149	0.152	0.059
Main workers	**3108(3053)**	**3012**(3,004)	**96**(49)	0.133	0.139	0.057
Male	1936(2,065)	1874(2,019)	62(46)	0.114	0.119	0.049
Female	1172(988)	1138(985)	34(3)	0.185	0.193	0.077
Marginal workers	**2892**(2,063)	**2882**(2,060)	**10(3)**	0.117	0.121	0.020
Male	888(440)	884(438)	4(2)	0.095	0.097	0.015
Female	2004(1,623)	1998(1,622)	6(1)	0.133	0.135	0.025
Non workers	**6231**(4,262)	**5952**(4,180)	**279**(82)	0.129	0.134	0.074
Male	2845(2,093)	2701(2,035)	144(58)	0.136	0.139	0.097
Female	3306(2,169)	3251(2,145)	135(24)	0.121	0.130	0.059

Table 2: Demographic and RCH status data of Upper and Lower Bonda groups were primarily gathered through field surveys.

Indicators	Upper Bonda	Lower Bonda
Number of House Hold (HH)	333	285
Male	637(49%)	656(49.5%)
Female	663(51%)	670(50.5%)

Total Population	1300	1326
Male literacy (%)	17.8	18.9
Female literacy (%)	6.3	6.6
Sex ratio	1041	1021
Number of births	36	42
Crude birth rate (CBR)	28	32
Number of deaths	22	16
Crude death rate (CDR)	16	12
No of Infant death (Infant mortality rate, IMR)	4(111)	3(71)
Death of no of children aged <5yr (U5MR)	3(83)	3(71)
Number of maternal deaths	4	2
Number of institutional deliveries	13(36%)	19(45%)
Number of home delivery	23(64%)	23(55%)
Colostrums given within one hour	13(36%)	24(57%)
Fully immunized children (new born)	19(53%)	32(76%)
Number of pregnant women	26	27
Number of lactating mothers	30	28
Number of women given at least 1 TT	18(69%)	21(78%)
Number of pregnant women with full antenatal check up	7(27%)	12(44%)
Number of women using IFA tablet	3(12%)	5(19%)

Table 3: Age at marriage among Bonda tribe

Age at marriage	**Upper Bonda**		**Lower Bonda**	
	Female	**Male**	**Female**	**Male**
Below 15	34(11%)	54(17%)	28(9%)	22(8%)
15-19	139(44%)	149(48%)	98(33%)	85(30%)
20-24	68(22%)	54(17%)	75(25%)	103(36%)
25-29	44(14%)	35(11%)	61(20%)	54(19%)
30-34	14(4%)	11(4%)	20(7%)	12(4%)
35-above	14(4%)	10(3%)	16(5%)	10(3%)
Total	**313**	**313**	**298**	**286**

Table 4: Common family planning practices and childhood diseases among Bonda tribes

Family Planning Methods	**Upper Bonda**	**Lower Bonda**
Female Sterilization	4(8%)	12(24%)
Male Sterilization	0(0%)	1(2%)
Copper T/IUD	0(0%)	0(0%)
Periodic Abstinence	3(6%)	4(8%)
Pills	5(10%)	11(22%)

Condom	0(0%)	3(6%)
Emergency Pill	0(0%)	0(0%)
Traditional Method	5(10%)	3(6%)
Do not know about any family planning method	33(66%)	15(30%)
Common childhood diseases	Number of children affected and percentage within bracket)	
Diarrhea	12(2.3%)	7(1.3%)
Malaria	17(3.3%	8(1.5%)
Measles	8(1.5%)	5(0.9%)
Pneumonia	10(1.9%)	6(1.1%)
Tuberculosis	6(1.2%)	4(0.7%)
Scabies	51(9.8%)	42(7.7%)
Dysentery	8(1.5%)	4(0.7%)
Without diseases (%)	408(78.5%)	470(86%)
Total Children up to 14yrs (%)	520(40%)	546(41%)
Total Population	**1300**	**1326**

4. Conclusion

The Bonda tribe, one of the 13 Particularly Vulnerable Tribal Groups (PVTGs) of Odisha, resides in the remote Bonda hills of Malkangiri district. Despite their traditional lifestyle, they are increasingly exposed to external influences through migration, government interventions, and market interactions. However, their access to primary healthcare remains inadequate, leading to a high prevalence of endemic diseases such as malaria, diarrhoea, scabies, anaemia, and pneumonia.

Over the years, the Bonda population has grown from 2,565 (1941) to 12,231 (2011), and literacy has increased from 2.1% to 28.45%. However, their literacy rate remains significantly lower than the district, state, and national averages. The sex ratio in both Upper and Lower Bonda is higher than the state and national figures, reflecting no apparent gender bias. However, high birth and death rates, early marriage, teenage pregnancy, and high total fertility rates (TFR) remain major concerns.

Maternal and child health indicators are poor, with low antenatal care, institutional deliveries, and postnatal care. Indigenous home delivery practices dominate, contributing to high infant and under-five mortality rates. Immunization rates are low, and malnutrition is widespread among Bonda children. The COVID-19 pandemic has further exacerbated their vulnerability, affecting healthcare access, nutrition programs, and overall well-being.

Recommendations

- Strengthen coordination, monitoring, and evaluation of maternal and child health services.
- Conduct frequent health awareness campaigns through government and NGOs.
- Integrate indigenous health practices with modern healthcare services.
- Improve healthcare infrastructure and resources at the district level or through the Bonda Development Agency for better accessibility.

- Promote education in the local language with tribal teachers to enhance literacy, which will indirectly improve health and socio-economic conditions, integrating the Bonda tribe into mainstream development.

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