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Assessment of health and mortality rates in children aged 6 to 18 years In Birhor: A primitive tribe of Dharamjaigarh, Raigarh, Chhattisgarh

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Abstract

This study assesses the health and mortality indicators of Birhor children aged 6-18 in the Dharamjaigarh block of Raigarh district. Due to their socioeconomic isolation and nomadic background, the Birhor, a Particularly Vulnerable Tribal Group (PVTG) in Chhattisgarh, have serious health problems. The purpose of this study is to examine the health and morbidity patterns among Birhor children (aged 6–18 years) in Dharamjaigarh Block, Raigarh, Chhattisgarh. Materials and Methods: 50 Birhor youngsters (boys and girls aged 6-18) participated in this study. The health state was assessed using anthropometric indices, family literacy, cultural feeding behaviours, and socioeconomic status. A clinical examination and a history of prior illnesses were used to analyse the current illness and study the morbidity pattern. Findings: 32.5% of children were underweight, 22% were stunted, and 24% were thin. The following common morbidities were prevalent: Pallor (66%), skin infections (24%), lymphadenopathy (22%), caries teeth (32%), and conjunctival xerosis (38%). 46% of cases had a history of acute febrile illness (not malaria), 16% had malaria, 16% had jaundice, 16% had envenomation, intoxication, or animal bites, 12% had a history of hospitalisation, and 12% had a history of trauma or accidents. Among the 5–18 age range, there were high rates of morbidity, including 32.5% underweight, 22% stunting, and 24% thinness. Anaemia (66%), conjunctival xerosis (38%), and dental caries (32%) were common morbidities. Data for the 6–18 age group shows a shift toward chronic nutritional deficiencies rather than acute mortality, even though child mortality is still a major concern. Conclusion: Although the health status of these youngsters was not critical when compared to other tribes in other states, this study revealed a high frequency of morbidities in the Birhor tribe.

Keywords: *Birhor, Primitive tribes, Health, BMI, Mortality, Children*

Introduction

The Birhor are a Particularly Vulnerable Tribal Group (PVTG) who primarily live in the districts of Raigarh, Jashpur, and Bilaspur in Chhattisgarh's forest-fringe areas. The Mundari terms Bir (forest) and Hor (man) are combined to form the word Birhor, which means "man of the forest". The Birhor tribe is thought to have originated from the Kolarian clan. The Birhor tribes inhabit grass-thatched homes (Tada) outside villages, near hills, mountains, rivers, streams, and caves. The sun god, Budhi Mai, the ancestors, the mountains, and the trees are venerated as the primary deity. Hunting, gathering medicinal plants, manufacturing rope from Moline tree bark, selling wood, and subsisting on kanki-koda and Mahua are their primary sources of income. The Birhor tribes once lived in temporary dwellings made of branches, leaves, and other natural materials. However, as they have transitioned to a more established existence, some of them might now live in more permanent dwellings built of mud, thatch, or other locally accessible materials. However, due to urbanisation and government initiatives, several Birhor tribes have recently established permanent or semi-permanent settlements. The Birhor, who were formerly nomadic hunters and gatherers, have experienced severe cultural and economic upheavals as a result of industrialisation and deforestation. They are frequently in a position of great socioeconomic backwardness as a result of these changes, which is directly linked to poor health outcomes and high death rates. Scheduled Tribes (ST) continuously indicate higher mortality statistics in the larger context of tribal health in India. The Birhor tribe is at the extremity of this spectrum; according to studies, their Under-Five Mortality Rate is the worst in the nation at 203 per 1,000 live births, which is far higher than the tribal average of 101. According to the 2009 statistical report of the Government of India (1), about 31.6% of Indians are children aged 6-18. These children's proper development is crucial, since growth at this age is critical to their intellectual, psychological, and physical development, as well as to their ability to contribute to a healthy society and country. The primitive Birhor have numerous issues with housing, health, poverty, hunger, unemployment, debt, and illiteracy.

To live a healthy and active life, the human body needs adequate nutrition. Only a healthy person can create a thriving society, leading to the country's prosperity. A man's physical development is frequently hampered by inadequate diet and nutrition, and his mental and social development is also negatively impacted. All of these contribute to a variety of illnesses; in addition, extreme malnutrition causes a person to die. Childhood undernutrition remains a major public health issue in India despite the country's rapid economic growth, increased food production, and several nutritional intervention programs implemented over the past 30 years. Undernutrition seems to be more prevalent in rural and Indigenous tribal communities. We can identify deviations from optimal growth and their causes by examining these kids' health status and common morbidities. As a result, we can combat this illness and reduce its burden by intervening at the appropriate levels. Although early childhood (0–5 years) is the subject of much research, children's health from ages 6 to 18 is also important, as this period is marked by substantial physical and cognitive development. Birhor children in this age range in Raigarh's Dharamjaigarh block have a high prevalence of "morbidities", the condition of having symptoms or being ill for a particular ailment. Research shows that more than 32% of these kids are underweight, and a sizable majority (66%) have anaemia or pallor. Poor personal hygiene exacerbates these problems, resulting in a high incidence of tooth cavities (32%) and skin infections (24%). Additionally, the Birhor community's dependence on natural, frequently tainted water sources and traditional treatment (Baiga) feeds a vicious cycle of avoidable diseases like gastroenteritis, typhoid, and malaria. A multifaceted strategy that combines better healthcare infrastructure with culturally tailored dietary awareness programs is needed to address the health and mortality of the 6–18-year-old demographic.

Primitive tribes (2) are characterised by low literacy, pre-agricultural technologies, and a population that is either stable or declining. The five primitive tribes of Chhattisgarh are the Birhors, Abujhmaria, Baiga, Kamar, and Hill Korba. The precise translation of Birhors is "dwellers of the forest" (Bir-Forest, hor-dwellers). Anthropologists believe they belong to the proto-Australoidea group, and Mundari is their language. It is a member of the Austroasiatic family (3). They are mostly found in the districts of Raigarh and Sarguja, in the blocks of Lailunga, Dharamjaigarh, Tamnar, Pathalgaon, Bagicha, Kasabel, and Kunkuri, Chhattisgarh. 573 Birhor people are living in the Dharamjaigarh block, which is the subject of the current study. There are about 148 families dispersed throughout 15 villages (4). 1,145 people are living there, and the literacy rate in Chhattisgarh is 11.54% (5).

Objective

The main objectives of this study are

1. To determine rates of stunting, wasting, and thinness by comparing anthropometric indices (height, weight, and BMI) with the WHO growth guidelines to assess the prevalence of malnutrition.
2. To determine the prevalence of common diseases and clinical conditions, such as anaemia, conjunctival xerosis, dental caries, and skin infections, through medical history.
3. To determine the Birhor tribes' age-specific mortality rates for children between the ages of 6 and 18, and to pinpoint the main reasons of death, such as accidents or infectious diseases like malaria or respiratory infections.

Materials and Methods

Between January 2023 and June 2024, an analytical study was conducted in the Dharamjaigarh block of Raigarh district, Chhattisgarh; among Birhor tribal children aged 6 to 18. The study included all Birhor children aged 6 to 18. Every home was visited door-to-door to collect data from the parent or head of the family using a pretested, structured questionnaire. People were encouraged to participate in the study with assistance from local health workers. Anthropometric measurements of weight, height, and body mass index (BMI) were performed on all children using the conventional method [6,7], along with a detailed history of prior illnesses and a comprehensive clinical assessment. The present health status of these youngsters was evaluated using anthropometric indices, and observations were interpreted in accordance with the WHO Multicentric Growth Reference Charts (2007) [8]. The Master Chart was created using the gathered data. Based on several criteria, they were categorised and tallied. After entering the data into Microsoft Excel, statistical software was used to analyse it. SPSS-IBM (version 20) is the statistical program utilised for data analysis. When suitable, the chi-square test was employed as the significance test. Taking the p-value and 95% as the confidence limit.

Literature Review

These features shield the government from the Birhor tribes, and their way of life has occasionally caught the interest of numerous academics. As a result, numerous researchers have conducted studies, including Dalton (1960), Dryer (1891), Hutton (1951), Risley (1964), Ram (1916), Yodhari (1964), and others. In his study paper "Scenario of Tribal Development in the Central Satpuda Highland," SS Katare (1993) developed, implemented, and assessed basic and structural policies and programs aimed at developing tribal social environments. In his study "Levels of Socio-Economic Development of Tribal Population in Madhya Pradesh," Naresh Kumar (1993) examined various facets of the growth of tribal societies and their spatial organisation in relation to socio-economic development. In his research paper "Socio-Economic Development of the Scheduled Tribes in India," P.R. Shukla (1995) looked at the barriers to the socioeconomic advancement of tribes, including illiteracy, child marriage, housing, health, transportation, and communication. The Birhor tribe, where 83% of people live below the poverty line, was the subject of a study by Pandey and Kavishwar (1998) on marital conduct. 95.99% of the families made rope, while the majority (96.39%) lacked literacy. The Birhor tribe of Madhya Pradesh was the subject of Sinha's (1999) study, which examined the population distribution, language, sixth government, economy, religion, marriage, caste panchayat, etc. 82% of the Birhor tribe were illiterate, according to Pandey and Lakda's (2000) study on mother and child health care. In the Bilaspur district, Ranjana Sharma (2000) studied the growth, challenges, and concerns in agriculture and nutrition at the district level. In their 2001 study, Surendra Parihar and Ashok Pradhan highlighted the significance of tribal development in India.

Study Area

The Dharamjaigarh Block is located in the northern Chhattisgarh district of Raigarh. The district is one of Chhattisgarh's most scenic areas, with its verdant forests, hills, and rivers. Dharamjaigarh's geographic coordinates are 22.47°N, 83.22°E. It is 300 meters (980 feet) above sea level on average. On the Raigarh-Ambikapur Highway, Dharamjaigarh is situated around 77 miles northwest of Raigarh. 14,354 people are living in Dharamjaigarh Block, with 7,279 men and 7,075 women, according to the 2011 census. The district has a population density of 380 people per square mile, or 146 people per square kilometre. The population grew by 14.65% between 2001 and 2011. 1,784 children between the ages of 0 and 6 make up 12.43% of Dharamjaigarh's total population. The state average for Chhattisgarh is 969, while the child sex ratio in Dharamjaigarh is 1016. Compared with the state average of 70.28%, Dharamjaigarh's literacy rate is higher at 79.70%. Approximately 88.38% of men and 70.71% of women in Dharamsaigarh are literate, and 5,447 of the city's total population works or owns a business. Among them were 3,873 men and 1,574 women. According to the census survey, a worker is someone who engages in labour-intensive activities like business, services, or agriculture. Of the 5447 people who were employed, 1.68% worked in Main Work and 18.32% in Marginal Work. Dharamjaigarh's economy is based primarily on rain-fed agriculture. Farmers' main crop is paddy. However, they are unable to get a fair price for their crops because their produce is difficult to market. They are too small to handle all of the produce, even if there are a few. An IT corporation is considering setting up a plant here, which may open in two to three years. Dharamjaigarh is the most underdeveloped area in Chhattisgarh.

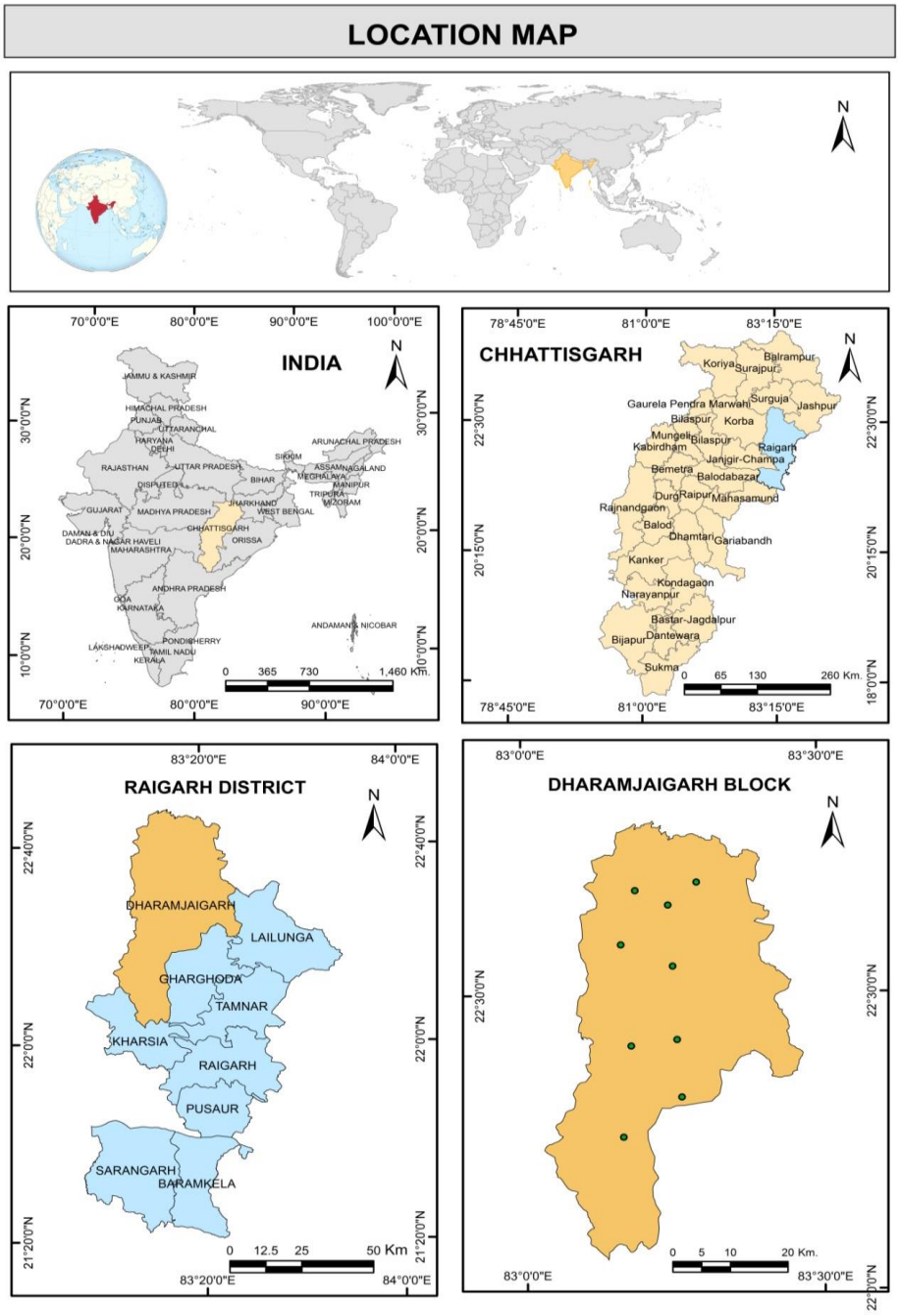

Fig 1. Location Map of the study area

Results

The demographic profile describes a sample of the 50 children in our study; 16 (32%) were female, and 34 (68%) were male. The majority of the children (20, 40%) were between the ages of 5 and 7 (Table 1). 32.5% of children were underweight (weight-for-age), 22.5% had moderate malnutrition, and 10% had severe malnutrition, according to WHO's categorisation of malnutrition.

Table 1: Demographic profile

Age in years	Female (%)	Male (%)	Total
6-7	4 (20.0)	16 (80.0)	20
8-10	11 (57.9)	8 (42.1)	19
11-13	0 (0.0)	7 (100.0)	7
>13	1 (25.0)	3 (75.0)	4
Total	16 (32.0)	34 (68.0)	50

Source: field survey

Table 2: Distribution of thinness as per age groups and sex

Distribution of thinness as per age groups				
Age in years	**Normal BMI (%)**	**Thin (%)**	**Severe thin (%)**	**Total**
6-7	19 (95.0)	1 (5.0)	0 (0.0)	20
8-10	11 (57.9)	4 (21.1)	4 (21.1)	19
11-13	4 (57.1)	0 (0.0)	3 (42.9)	7
>13	4 (100.0)	0 (0.0)	0 (0.0)	4
Total	38 (76.0)	5 (10.0)	7 (14.0)	50
Distribution of thinness by sex				
Sex	**Normal BMI (%)**	**Thin (%)**	**Severe thin (%)**	**Total**
Female	13 (81.3)	1 (6.3)	2 (12.5)	16
Male	25 (73.5)	4 (11.8)	5 (14.7)	34
Total	38 (76.0)	5 (10.0)	7 (14.0)	50
BMI: Body mass index				

Source: computed by the author

According to Table 2, 22% of children were stunted, and 24% of children were thin (10% thin and 14% very thin). According to the revised WHO reference tables for BMI (ages 5-19), a person was considered thin if their BMI for age and sex was below 2 standard deviations (SD), and severely thin if it was below 3 SD. Male thinness was marginally higher than female thinness (p=0.81), and it rose with age, except in children older than 13 (n=4).

Table 3: Relation of thinness with the per capita income of the family

Per month income	Normal BMI (%)	2 Thin (%)	Severe thin (%)	Total
<100	2 (66.7)	0 (0.0)	1 (33.3)	3
100-500	19 (73.1)	4 (15.4)	3 (11.5)	26
500-1000	15 (83.3)	1 (5.6)	2 (11.1)	18
>1000	2 (66.7)	0 (0.0)	1 (33.3)	3
Total	38 (76.0)	5 (10.0)	7 (14.0)	50
BMI: Body mass index				

Source: computed by the author

Malnutrition was somewhat more common in males (33.33%) than in girls (31.3%), although this difference was not statistically significant (p=0.83). Malnutrition was present in all income levels, according to Table 3 (p=0.501). While mild malnutrition did not follow this trend, severe malnutrition declined as wealth increased. Longer-term breastfed children had lower rates of malnutrition (56% at 1 year, 33.35% at 1.5 years, 24% at 2 years, 40% at 3 years, and none at 4 years). This difference was not statistically significant (p=0.32).

Table 4: Morbidity pattern in different age groups and sex

Age in years	Hair changes	Anemia	Conjuntival xerosis	Caries teeth	Lymphadeno pathy	Skin infection	Total
Morbidity pattern in different age groups							
6-7	5	15	7	9	6	7	20
8-10	4	12	8	6	3	1	19
11-13	1	3	2	0	2	2	7

>13	0	3	2	1	0	2	4
Total	10	33	19	15	11	12	50
Morbidity pattern according to sex							
Female	4	10	7	5	5	2	16
Male	6	23	12	11	6	10	34
Total	10	33	19	16	11	12	50

Source: computed by the author

The children whose complementary feeding was initiated between 6 and 8 months had the best nutritional status; those who were introduced earlier or later had higher rates of malnutrition (6 months: 38%, 7 months: 44%, 8 months: 22.2%, and 10 months: 50%); however, this was not statistically significant (p=0.501). Stunting was observed across all age groups; it was least common among children aged 8 to 10 and more common among boys than among girls (23.5% and 18.8%, respectively). The distribution of prior morbid illnesses is shown in Table 4, and the most common condition (46% of children) was acute febrile illness (not malaria).

Table 5: Distribution according to morbidity pattern

Morbidity	**Number of cases (%)**
Dry/depigmented hair	10 (20.00)
Anemia	33 (66.00)
Conjunction xerosis	19 (38.00)
Angular stomatitis	0 (0.00)
Caries teeth	16 (32.00)
Lymphadenopathy	11 (22.00)
Skin Infections	12 (24.00)
Morbidity pattern as per history	
H/O VPD	2 (4.0)
Jaundice	8 (16.0)
Acute febrile illness	23 (46.0)
Diarrhoea (recurrent)	3 (6.0)
ARI (recurrent)	5 (10.0)
Malaria history	8 (16.0)
H/O hospitalization	6 (12.0)
H/O blood transfusion	4 (8.0)
H/O envenomation/ intoxication/animal bites	8 (16.0)
H/O trauma/injury/accidents	6 (12.0)
ARI: Acute respiratory illness, VPD: Vaccine-preventable disease	

Source: computed by the author

16% of children had a history of malaria, 16% had an animal bite or envenomation, and 16% had jaundice. The morbidity trend among Birhor children is shown in Table 5. The most prevalent morbidity was anaemia (66.0%), followed by conjunctival xerosis (38.0%), caries (32%), skin infections (24%), lymphadenopathy (22%), and depigmented hair (20%). While hair depigmentation and dental caries decreased with age, anaemia and conjunctival xerosis were common in all age groups. While skin infections were less common in the intermediate age group (8–13 years), lymphadenopathy was more common in younger children. Except for skin infections, which were more common in boys, all morbidities were more common in female children.

Discussion

According to a State Tribal Board survey, Birhor primarily reside in Dharamjaigarh, Lailunga, and the Tamnar and Gharghoda blocks of Raigarh district. There are 212 families and 819 people living in the Raigarh district, whereas 148 families and 573 people live in 15 villages in the Dharamjaigarh Block. Few studies have reported a lower prevalence of malnutrition in this age group of children than in other tribes in different states (Table 3). Nonetheless, the research population's elevated morbidities were consistent with findings from earlier investigations. According to a study by Susmitha et al. [9], the most common causes of morbidity were pediculosis (83.2%), anaemia (41%), dysmenorrhea (43.6%), dental caries (28%), skin conditions (26.4%), and vitamin insufficiency (21.5%). According to Srinivasan and Prabhu [10], skin problems (25.7%), dental caries (21.5%), worm passing in faeces (21.6%), and vitamin B insufficiency (3.2%) were the most common morbid conditions among Tirupati children aged 6 to 17. The tribal youngsters in Jabalpur had a high incidence of scabies (7.1%), according to Chakma et al. [2]. It's interesting to note that this (Birhor) tribe did not have sickle cell disease, a fairly common hemoglobinopathy in Chhattisgarh. Nonetheless, 2.2% of the youngsters in this tribe had β-thalassemia. In 2012, Divakar et al. [11] discovered that dietary deficiencies (14.68%), skin infections (12.78%), diarrhoeal diseases (12.25%), and dental problems (10.98%) were the most common illnesses among the tribal community. Poor oral hygiene (55.4%), pediculosis (39.2%), cold and cough (25.8%), lymphadenopathy (22.2%), scabies (16.2%), swollen tonsils (7.8%),

and ear discharge in females (7%) were the different morbidities, according to Singh et al. [12]. In a study of tribal children in Orissa up to age 15, Behera et al. [13] found that the most common morbidities were fever (24.4%), acute respiratory infection (ARI) (35.4%), goitre (14.4%), and diarrhoea (5%).

Conclusion

This study indicates that the low quality of life of tribal children is the cause of the high burden of illness. To improve the health of tribal children, adequate infrastructure is vital to reducing poverty and illiteracy. We found that morbidities like viral diseases and malnutrition were more common among Birhor tribal children between the ages of 6 and 18. However, these children's anthropometric indices did not show statistical significance when compared to those of children from other tribes in different states. However, additional work is needed to expand access to high-quality medical treatment to improve their health.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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