RESEARCH ARTICLE

A comparative study of the current nutritional and health status of male and female Lodha tribal people in Bankura district, West Bengal, India

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ABSTRACT

Background: The 2001 Census revealed that 5.5% of the state's population comprises scheduled tribes (ST), including the primitive Lodha tribe, found in densely forested regions. The harshest consequences of poverty, which still affect millions of tribal households in India, are chronic hunger and undernutrition. This study assesses the health and nutritional status of the male and female members of the Lodha tribe. *Method*: A total of 600 Lodha tribal individuals, including 300 male and female tribal women, were randomly selected from ten villages in Bankura. Their socioeconomic status, nutritional status, and anthropometric measurements were recorded. *Results*: The female Lodha tribe had a significantly higher prevalence of chronic energy deficiency (CED) at 83% compared to their male counterparts (59.7%). This study indicated that the overweight and obese category of CED had a greater impact on the male Lodha tribal community. The study highlights the negative effects of obesity in tribal families, revealing insignificantly lower physiological markers in females in the Lodha tribe. Similarly, no significant difference in morbidity patterns was noted among them. *Discussion*: The rate of undernutrition indicated a bad situation based on the WHO classification of CED. The Lodha tribal community suffers from a variety of nutritional inadequacies, including low labor capability, undernutrition, and shortages in energy, protein, and fat, especially among females. *Conclusion*: Therefore, effective nutritional intervention programs must be initiated to alleviate nutritional stress within this ethnic group.

Keywords: Indian Lodha tribe, Chronic Energy Deficiency (CED), Nutritional status, Health status.

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INTRODUCTION

West Bengal had 8,01,76,197 residents in 2001, with 44,06,794 being Scheduled Tribes (STs).[1] The ST population grew by 15.7% every ten years between 1991 and 2001. Of the ST population, 34.8% were literate, and 1.9% were Lodhas.[2] The 2011 census reported 108,707 Lodhas in West Bengal. The Santal community makes up 51.8% of the 378 Scheduled Tribes (STs) in the state of West Bengal. Other significant STs are Oraon (14%), Munda (7.8%), Kora (3.2%), and Bhumij (7.6%). Savar, Bhutia, Bedia, Mahali, and Lodha are the other STs.[3] The vast majority of STs (93.9%) reside in rural regions. There are 104.3 million tribal people in India, which accounts for 8.6% of the total population, according to the 2011 census. Of them, 89.97% live in Jangal Mahal and other rural areas. Chronic hunger and undernutrition among India's tribal households have been contributing to a serious health catastrophe. The nation faces challenges in health, nutritional security, economic development, social welfare, and education, despite its wealth, ethnic diversity, and large population. Despite advances in health, science, and technology, some 75 archaic tribes still survive in the woods in 15 states and union territories. According to the 2011 census, 84 million tribal people comprise 8.2% of India's total population.[2] The Lodha tribe, a Particularly Vulnerable Tribal Group (PVTG) in West Bengal, India, lives in deep forests of Midnapore, Bankura, Purulia (West Bengal), Mayurbhanj (Odisha), and Singhbhum (Jharkhand), with a unique language, traditions, and lifestyle.[3] They rely on forest income, manual labor, and collecting small amounts of food. The British government labeled them a "criminal tribe" until the Criminal Tribes Act of 1952 was repealed. The community boycotts criminal activities due to its ingrained culture in the area.[4]

The PVTG faces significant challenges due to poverty, ignorance, illiteracy, customs, tradition, and blind beliefs. Despite their poor health and nutritional condition, women significantly influence their family members' health. Effective health interventions require a comprehensive understanding of tribal women's health, as they are now viewed as a deteriorated human group. To comprehend the health and nutritional status of tribal communities, particularly in the Lodha tribe region, region-specific research is required. Regional variations in the number of ethnic women may not have been adequately considered in the national survey. In addition to having a low literacy rate, with women having

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a lower rate, the Lodha community experiences ongoing energy problems. To enhance the lives of these vulnerable populations, it is crucial to understand these dietary and nutritional aspects, as nutritional status evaluation is considered a key measure of health.[5] Significant nutrition research showed that 19.4% of the Lodha children were wasted, 26.1% were stunted, and 33.9% were underweight.[6] Panda and Guha described the development situation among the Lodha tribe and highlighted the shortcomings of the government's approach toward the development of the marginalized community.[7] However, study the nutritional and health status of the tribal people. A chronic energy deficiency is noted among the men of the Lodha community, as reported by Goswami.[8] The Lodha community is socially and economically backward, and the total literacy rate of the Lodha tribe is 43.1%, whereas the female literacy rate is 35.1% as per the 2011 census.[9] There are still some gaps in the study on nutritional and CVD index-related studies for Lodha adult tribal women in the Bankura district, even though many studies (particularly anthropometric or BMI-related) have already been conducted on sub-tribal populations. Furthermore, there is no information available about the nutritional health and eating habits of the Lodha communities. To gather essential data on health and nutritional circumstances, the current study was conducted to assess the health and nutritional status of the Lodha tribe, comprising both adult males and females. This information may help to construct the necessary development plans for the food and nutritional security of the tribal people (especially women) of Lodha in the district of Bankura, West Bengal.

MATERIALS AND METHODS

Location and selection of study area

The districts of Paschim Medinipur, Bankura, and Jhargram are home to the majority of West Bengal's Lodhas. According to demographic research statistics, this type of field study did not reveal any information about Lodha communities in West Bengal's Bankura area. Based on this viewpoint, the study was conducted in 10 villages across the Raipur, Khatra, Sarenga, and Simlapal blocks of the Bankura district, as these areas are where the Lodha tribal people are most prevalent. The current cross-sectional study was conducted between 2022 and 2023 with the aim of assessing the nutritional and health status of the Lodha tribal population.

The purpose and possible complications of the investigation were explained to all participants, and written consent was obtained from parents. Human ethical approval (Ref. No. VU/IHEC-4/3-23, dated October 13, 2023) was obtained from the Institutional Human Ethics Committee at Vidyasagar University for this study. Individuals aged 20 to 60 years were included in the study. Individuals with physical disabilities and with known/diagnosed disorders were excluded from the study. Pregnant and lactating mothers were also excluded from the study. Three hundred women and three hundred tribal men, totaling six hundred Lodha people, were chosen at random. To select Lodha tribal members, we first created a sampling frame, which is a comprehensive list of all eligible Lodha families in the research region. Every home was assigned a number. The sample is chosen using either random number tables or a random number generator. This ensures that every household has an equal chance of being selected. Additionally, each household that is chosen gives its informed consent.

Data collection of the studied populations

The information or data was collected using the questionnaire method. One of the key elements influencing a person's or a family's health and nutrition is their socioeconomic status (SES). Therefore, we employed the Udayparekh Scale questionnaire (2019) method for data collection.[10] A person's relative economic and social position is influenced by several characteristics, including those that can be measured by SES and those that affect income, education, occupation, familial influence, physical assets, social status, social involvement, caste, political influence, and muscle power. To assess the socioeconomic classes of families in specific contexts, such as urban or rural settings, several measures (Udayparekh Scale, 2019) have been proposed and documented. This scale includes nine key variables, each contributing to the household's SES. Based on a predetermined scale, a score is assigned to each of the nine variables. The scores for all the variables are summed to determine the final score. Different SES groups are assigned to families based on the final result. With the assistance of Asha and Anganwadi, employees from the local Integrated Child Development Service (ICDS) project office, the medical officer performed a clinical examination and diagnosed each individual.

Anthropometric Measurements

Using standard tools and techniques, anthropometric measurements, including height, weight, waist, hip, and mid-arm circumferences, were taken.[11] Before and after each session, calibrated lever-accurate weighing scales were employed. Weight should be measured to the closest 0.01 kg while wearing the least amount of clothing possible. The respondents' heights were measured to the nearest 0.1 cm on the height board, and every precaution was taken to ensure that they were standing erect with their feet flat and solid on the wall. The circumferences of the waist, hips, and mid-arms were measured using non-stretchable fiber tape. A standard algorithm based on Asian Indian-specific recommendations for defining and controlling overweight and obesity was used to calculate BMI.[13] [BMI = weight (kg)/height (m^2)]. Table 1 shows the cut-off points used, as per the WHO [12,13].

Nutritional analysis

Recommended Dietary Allowances (RDA) set by the Indian Council of Medical Research (ICMR) in 2020.

Table 1: The International Classification of adult underweight, overweight, and obesity according to BMI (Source: Adapted from WHO, 1995, WHO 2000, and WHO 2004)

Classification	*BMI (kg/m^2)*	
	Principal cut-off points	*Additional cut-off points*
Underweight	<18.50	<18.50
Severe thinness	<16.00	<16.00
Moderate thinness	16.00–16.99	16.00–16.99
Mild thinness	17.00–18.49	17.00–18.49
Normal range	18.50–24.99	18.50–22.99
		23.00–24.99
Overweight	≥25.00	≥25.00
Pre-obese	25.00–29.99	25.00–27.49
		27.50–29.99
Obese Classification	≥30.00	≥30.00
Obese class I	30.00–34.99	30.00–32.49
		32.50–34.99
Obese class II	35.00–39.99	35.00–37.49
		37.50–39.99
Obese class III	≥40.00	≥40.00

Statistical Analysis

A chi-square test was employed to analyze the data collected on age, income, family type, and education for each group using SPSS 21.0.[14]

RESULTS

Table 2 presents a demographic analysis of a sample of 300 males and 300 females, detailing their family structure, number of children, total family size, and educational status. For both males and females, the most common family type is nuclear, followed by extended and then joint families. The majority of males are from nuclear families, while a slightly higher proportion of females are from nuclear households. When it comes to the number of children, a substantial portion of both male and female respondents have more than three children. A smaller number of individuals have three, two, or one child. Regarding total family size, the largest category for both genders is four to seven members. The smallest category for both is more than seven members. Educational status shows that the largest group for both males and females is illiterate. The next most common educational level is up to primary school, followed by secondary school. A small percentage of respondents have completed higher education. Notably, there were no individuals with a graduate or postgraduate degree in the sample.

A breakdown of the economic and occupational characteristics of a sample of 300 males and 300 females is presented in Table 3. A key difference between genders is their occupation.

Table 2: Demographic and educational characteristics of the Lodha community

Personal demographic variables	*Male*	*Female*
Type of family		
Joint	95 (31.6)	32 (10.6)
Nuclear	140 (46.7)	220 (73.4)
Extended	65 (21.7)	48 (16.0)
Number of children		
One	7 (2.3)	16 (5.3)
Two	25 (8.3)	32 (10.7)
Three	79 (26.4)	26 (8.7)
More than three	189 (63.0)	226 (75.3)
Total family members		
One to Three	58 (19.3)	42 (14.0)
Four to Seven	218 (72.7)	222 (74.0
More than Seven	24 (8.0)	36 (12.0)
Educational status		
Illiterate	194 (64.7)	215 (71.7)
Primary: Up to Standard V	76 (25.3)	42 (14.0)
Secondary: Standard VI to X	24 (8.0)	35 (11.7)
Madhyamik: Standard X passed	6 (2.0)	5 (1.6)
Higher Secondary: Standard XII passed	2 (0.6)	3 (1.0)
Graduate/Postgraduate	–	–

N = 300 for males and 300 for females. Each value represents the number in the category and the percentage in parentheses.

The majority of males are engaged in agriculture, while most females work as laborers. Both groups have a similar proportion of individuals participating in the MGNREGS program. A majority of both males and females report that their family lacks a continuous, year-round income. Regarding physical activity levels, females tend to have a much higher proportion of heavy activity compared to males, who are more evenly distributed across sedentary, moderate, and heavy activity levels. The data on income sources indicates that most males rely on a combination of agriculture and other sources. At the same time, the overwhelming majority of females have diverse income streams beyond just agriculture. The monthly income for both groups is generally low, with the most significant percentage of individuals earning less than ₹ 3000. Most families in the sample have either one or two earning members. The majority of both male and female respondents' families are not in debt, and a significant portion of both groups are categorized as being below the poverty line.

A comparison of BMI classifications between a sample of 300 males and 300 females is presented in Table 4. A notable and statistically significant association is observed between gender and BMI category. The most common BMI category

Table 3: Socioeconomic status indicators of the Lodha community

Personal demographic variables	*Male*	*Female*
Self-occupation		
Agriculture	116 (38.7)	33 (11.0)
Labor	128 (42.7)	202 (67.3)
MGNREGS	56 (18.6)	65 (21.7)
Continuous earning for the family (year-round)		
Present	105 (35.0)	95 (31.7)
Absent	195 (65.0)	205 (68.3)
Activity pattern		
Sedentary	126 (42.0)	26 (8.6)
Moderate	94 (31.3)	44 (14.7)
Heavy	80 (26.7)	230 (76.7)
Source of income		
Agriculture	106 (35.3)	74 (24.7)
Agriculture and Others	194 (64.7)	226 (75.3)
Monthly income (INR)		
< 2000	105 (35.0)	160 (55.3)
2000–3000	165 (55.0)	110 (36.7)
3000–5000	15 (5.0)	18 (6.0)
5000–10000	11 (3.7)	10 (3.3)
10000–15000	4 (1.3)	2 (0.70
Earning members in the family		
1	158 (52.7)	167 (55.7)
2	128 (42.7)	112 (37.3)
>2	14 (4.6)	21 (7.0)
Debt condition		
Present	108 (36.0)	82 (27.3)
Absent	192 (64.0)	218 (72.7)
Economic status of the families		
Above the Poverty Line	26 (8.7)	38 (12.7)
Below the Poverty Line	274 (91.3)	262 (87.3)

N = 300 for males and 300 for females. Each value represents the number in the category and the percentage in parentheses.

for both males and females is underweight. However, a much higher proportion of females fall into this category compared to males. The next most common category for males is the normal range, while for females, it is over the normal range. The percentage of males in the normal range is significantly higher than that of females. A relatively small percentage of both genders are classified as overweight or obese. The proportion of overweight individuals is similar between males and females, and the same holds good for the obese category, though the percentages are extremely small for both sexes.

Table 5 presents a nutritional analysis, comparing the calculated daily intake of several key nutrients for males and females against their recommended daily allowances (RDA). The data highlights significant differences in both the absolute intake and the percentage of RDA met for certain nutrients between the two sexes. For energy, protein, and fat, males have a higher average intake than females. However, when looking at the percentage of RDA met, both sexes fall short of their recommended energy intake. Both groups are also not meeting their fat intake recommendations, with females in particular consuming significantly less than the recommended amount. The protein intake for both sexes is relatively close to the RDA. A notable disparity exists in mineral and vitamin intake. The calculated intake of calcium is very low for both sexes, particularly for females. Both sexes fail to meet their RDA for this nutrient. For iron, while males surpass their RDA, females fall considerably short of theirs. The intake of carotene is similar for both males and females, and both groups are close to meeting their RDA. Finally, the vitamin C intake is well below the RDA for both males and females, with females consuming a much smaller proportion of the recommended amount. The data indicate statistically significant differences between sexes for energy, protein, calcium, iron, and vitamin C.

Table 6 presents a comparison of key physiological measurements between males and females from the Lodha tribal community. The physiological parameters examined are pulse rate and blood pressure, specifically systolic and diastolic. The data is presented as mean values with standard deviations. For all three parameters—pulse rate, systolic blood pressure, and diastolic blood pressure—the mean values are higher for males than for females. The difference in pulse rate and systolic blood pressure between the two sexes is not statistically significant. However, the difference in diastolic blood pressure is notable, with males having a higher average reading than females. The statistical analysis of the diastolic blood pressure is not provided in the table, but the comparison between the mean values is apparent.

A breakdown of the prevalence of various health issues in a sample of 300 males and 300 females is presented in Table 7. The data is presented for several categories of health problems, including different types of infections, nutritional deficiencies, and edema. The most common health issue for both sexes is intestinal infections. Respiratory infections and edema are also prevalent in both groups, with females showing a slightly higher proportion of these conditions. Skin infections and vitamin deficiencies are observed in both males and females, with the prevalence of these issues also being slightly higher among females. Overall, the prevalence of each health issue is similar between males and females. The statistical analysis indicates there is no significant association between gender and the presence of these health conditions.

DISCUSSION

Due to their unique sociocultural customs, remote location, and restricted access to contemporary infrastructure, India's tribal tribes constitute a vulnerable group. There is still a significant disparity in nutrition and health between

Table 4: Body mass index (BMI) of male and female tribes according to the WHO 1995

Grading of BMI	*BMI (kg/m²)*	*Male (%) N=300*	*Female (%) N=300*	
Underweight	<18.5	179 (59.7)	249 (83)	
Normal Range	18.5–22.9	95 (31.7)	35 (11.7)	$\chi^2 = 14.663$, $p = 0.0015$, Association is significant
Over Weight	23–24.9	19 (6.3)	11 (3.6)	
Obese	≥25	7 (2.3)	5 (1.7)	

Table 5: Dietary intake of Lodha Tribal females (24-hour recall method).

Nutrient/Day	*Calculated Intake*		*Recommended@*		*% of RDA Met*	
	Males	*Females*	*Males*	*Females*	*Males*	*Females*
Energy (Kcal)	1786.51± 324.55*	1158 ± 158.15*	2710	2130	73.7%	54.4%
Protein(g)	48.56 ± 6.86*	36.51± 6.86	54	45.7	80.9%	79.9%
Fat (g)	16.41 ± 5.41	11.41 ± 2.55	25	20	82.1%	57.1%
Calcium (g)	0.34 ± 0.06	0.20 ± 0.04*	1	1	34.7%	20.2%
Iron (mg)	17.73 ± 4.54	17.73 ± 4.54*	17	29	104.3%	61.1%
Carotene (mg)	0.87 ± 0.27	0.73 ± 0.14	1	0.8	86.7%	87.2%
Vitamin C (mg)	19.28 ± 4.58	15.48 ± 2.58*	80	65	48.2%	23.8%

Source: According to ICMR 2020
Data are Mean ± SD, * indicates p <0.05. @ value ICMR 2020 (moderate work)

tribal and non-tribal groups despite government initiatives. Although patterns differ between genders and geographical areas, the nutritional and health status of both males and females among the scheduled tribes (STs) continues to be an issue. Tribal populations continue to face a serious problem with undernutrition. Conventional eating patterns, limited dietary diversification, and food poverty are the leading causes of the high rates of stunting, underweight, and micronutrient deficiencies.

Male tribal members frequently work in physically taxing jobs, yet their low energy intake causes undernutrition. Between 28 and 35% of men have a low BMI. Their diets frequently consist mostly of cereal and are poor in fat and protein. Tribal women are more likely to experience nutritional deficits, particularly adolescent girls and expectant mothers. Over 55 to 60% of Lodha women suffer from anemia, which is incredibly common. Their susceptibility is increased by elements such as early marriage, recurrent pregnancies, and intra-household food discrimination. Male Tribals are more likely to experience physical harm and vector-borne illnesses like TB and malaria at work. Additionally, drug abuse, especially alcohol and tobacco, is more common among them, which exacerbates long-term health conditions like respiratory and liver disorders. Among tribal adults, BMI < 18.5 kg/m² is recorded in 30 to 40% of men and 35 to 45% of women (ICMR-NNMB, 2017). This reflects chronic energy deficiency

The Lodha family, which consists of parents and their children, is the lowest social unit in tribal society, according to a 2022 Shaan Academy report.[15] In the village of Lodhas, many opt to live in big, mixed families. The father is regarded as the head of the household since he is the eldest male member, and the male line inherits the family property. Comparably, our survey found that while 46.7% of Lodha tribe members are male and 73.4% are female, 31.6% of males and 10.6% of females belong to mixed families, respectively. According to Goswami, who discontinued from the study, the majority of Mankidia males (94.9%) and girls (98.1%) were illiterate; only 1.3% of females had completed primary education, compared to 4.5% of males[8]. The majority of Juang males (81.15%) and females (86.41%) were also illiterate[16], which reported different findings from the current study. In contrast, a considerable proportion of tribal men and women are illiterate, with just a small number of tribal women (1%) and men (0.6%) having finished secondary school, according to this field research of the Lodha group (Table 2).

However, in the Lodha community, 67.3% of the female tribes were employed as agricultural laborers, and 38.7% of the male tribes were mostly employed in agriculture (Table 3). Male Lodha participants in the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) were 18.6%, while female participants were 21.7%. The presence of owner cultivators among females was cited as a major sign

Table 6: Physiological parameters of Lodha tribal males and females

Parameters	*Lodha tribal male*	*Lodha tribal female*
Pulse rate (beats/min)	72.47 ± (15.1)	65.75 ± (18.8)
Systolic BP (mmHg)	107.76 ± (16.1)	103.45 ± (20.1)
Diastolic BP (mmHg)	77.79 ± (7.7)	65.24 ± (9.8)

BP = Blood pressure, Data are Mean ± SD. $\chi^2 = 0.2002$, $p = 0.1014$.

Table 7: Morbidity pattern between Lodha tribal males and females

Parameters	*Male (%)*	*Female (%)*
Skin infections	32 (10.66)	39 (13)
Intestinal infections	45 (15)	44 (14.6)
Respiratory infection	40 (13.33)	49 (16.33)
Vitamine deficiencies	33 (11)	41 (13.66)
Edema distribution	36 (12)	45 (15)

N = 300 for males and 300 for females. Each value represents the number in the category and the percentage in parentheses. χ^2 = 2.243, p = 0.3877

of optimism for the Lodha population's economic activity[17]. Interestingly, the Lodha woman stated that they would go collect firewood from the nearby forest or the roadway during their free time.[17] Harvesting forest goods was one of the Lodhas' primary economic endeavors. To survive, the Lodhas engaged in a range of economic activities, such as fishing, business, vegetable farming, domestic animal rearing, the production of Sal plates, Mahul wine, and Biri. However, Kanrar and Goswami noted slightly varied occupations, such as the fact that 58% of Juang women were unemployed and worked as homemakers and forest product collectors.[16]

At the same time, the current study reveals that over half of the tribes (65% of the males and 68.3% of the females) were unable to obtain continuous employment throughout the year, while 35% of the males and 31.7% of the females were able to do so. This study found that working with female Lodha was more difficult than working with male Lodha (Table 3). According to the current study, the number of earning family members is almost equal for both male and female Lodha tribes. Additionally, Table 3 shows that more female Lodha people do not have debt conditions than male Lodha people. However, among Lodha tribe members, 8.7% of men and 12.7% of women lived above the poverty level. Similarly, Lodha tribal people who were male (91.3%) and female (87.3%) lived below the poverty line. This suggested that the economic standards of the Lodha respondents, whether male or female, were deplorable up until this point. The WHO's recommendations were followed to maintain the accuracy of the BMI calculation used to assess obesity (Table 1). The current study attempted to infer the nutritional status of the Lodha population indirectly. In a related study, Kshatriya and Acharya reported that the total undernutrition rate among girls from nine tribes was 47.4%, compared to 32.1% for the males.[18] Furthermore, they reported that in contrast to their male counterparts, who exhibited a prevalence of less than 42% for overall undernutrition, three tribes, the Kora, Oraon, and Bathudi tribes, exhibited a 60% prevalence in the category of overall undernutrition (BMI<18.5 kg/m^2). Similar results on the Santal tribe were noted by Mukhopadhyay[19], who reported that although there was a substantial difference in the prevalence of undernutrition between males (30.5%) and females (38.5%), the difference was not statistically significant (χ^2 = 2.832, p = 0.092).[19] However, Mittal and Srivastav[20] reported that the rate of undernutrition was lower among female Oraon (30.7%) compared to male Oraon (47%). Compared to Lodha female tribal respondents (11.7%), a higher percentage of Lodha male respondents (31.6%) fell into the normal BMI range. In contrast to the current study, it has already been reported that a greater percentage of female Oraon (38.7%) fell into the normal BMI group than did male Oraon (22.5%).[20,21] In addition to warning tribal families about the impending burden of overweight and obesity, the antithesis of malnourishment, this study revealed that male Lodha tribe members were more likely to fall into the overweight and obese group of chronic energy deficit (CED).

A similar finding was made in this field study, which shows that the prevalence of obesity and malnutrition among Lodha tribal women is significantly greater (83%), compared to the prevalence among male Lodha tribal people (59.6%). On the other hand, when it came to the overweight and obese categories of chronic energy deficiency (CED), male tribals were more affected (overweight 6.3% and obese 3.5%), compared to female tribals (overweight 3.6% and obese 1.7%). The recommended dietary allowance (RDA) levels and low body mass index (BMI) have a strong correlation, particularly when it comes to overall health and nutritional sufficiency (Table 5). Nutrient consumption that continuously falls below RDA levels is known as undernutrition. A low body mass index (BMI) is frequently a sign of undernutrition, indicating that the Lodha tribal people are probably not getting enough energy and vital nutrients from their diet. In a related study, Bhuyan and Behera[22]found that undernutrition caused low blood pressure in both male and female Lodhas. Similar results were also seen in this study, as both SBP and DBP are below normal because of poverty and lower socioeconomic status. All of the physiological measures show a negligible change (Table 6). Mohapatra and Mahajan[23] found that West Bengal's tribal populations have a high prevalence of infectious diseases with morbidity. The morbidity pattern among Lodha males in our current field study was lower than that among Lodha females; however, there was a fluctuation in intestinal infection, with males experiencing a greater rate than females (Table 7).

CONCLUSION

This study found that the nutritional status of male Lodha tribal members is higher than that of female Lodha tribal members. The community suffers from a high illiteracy rate, particularly among women, and is underrepresented in higher education. Over 85% of Lodha households earn monthly incomes below the poverty line. Families with low incomes and limited job opportunities remain trapped in a cycle of poverty. Malnutrition, especially chronic energy insufficiency, is widespread among women, who are more susceptible to maternal health issues and anemia. Women are more prone to chronic energy deficiency (CED) malnutrition. Undernutrition, reduced labor capacity, and deficiencies in energy, protein,

and fat are the main concerns. Undernutrition, a condition where nutrient consumption consistently falls below the RDA, is prevalent among the Lodha tribal people. This indicates a lack of essential nutrients and energy, potentially leading to deficiencies and body issues. Additionally, they perform better than female tribal members on every physiological parameter (blood pressure, pulse rate, etc.). These challenges include skin and respiratory infections, edema, and vitamin deficiencies. Health initiatives and focused interventions from the government and commercial sectors are crucial to addressing this serious public health issue that affects the Lodha tribes.

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CONFLICT OF INTEREST

None.

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PEER-REVIEWED CERTIFICATION

During the review of this manuscript, a double-blind peer-review policy has been followed. The author(s) of this manuscript received review comments from a minimum of two peer-reviewers. Author(s) submitted revised manuscript as per the comments of the assigned reviewers. On the basis of revision(s) done by the author(s) and compliance to the Reviewers' comments on the manuscript, Editor(s) has approved the revised manuscript for final publication.