



# A Comparative Valuation of Nutritional and health status between tribal and non-tribal under five years children of Bhopal, Madhya Pradesh

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**Abstract:** Due to the social and economic vulnerability of tribal inhabitants, patterns and trends in tribal areas are necessary to track local epidemics and evaluate how well public health initiatives are working to prevent and manage disease. This led us to evaluate the health state and morbidity pattern of the Bhopal population, both tribal and non-tribal. 33 tribal hamlets in the forest areas of Bhopal were the subject of a cross-sectional study. Materials and Procedures 18 tribal hamlets were randomly chosen by lottery out of a total of 33 tribal hamlets. Data collection was done by house-to-house visits scheduled by both individuals and families using a pre-tested structured interview. Statistical measures of central tendency, the standard normal test (Z), and the Chi-square test ( $\chi^2$ ) were used to assess the data. A P-value of 0.05 or lower was regarded as statistically significant. Smith's Statistical Software, version 2.80, was used to conduct each test. Results: The study showed that, with a P value of 0.001, more tribal children (45.03%) than non-tribal children (22.47%) had protein energy malnutrition, and 7.35% of tribal children had severe malnutrition. In terms of morbidity, skin infections were more common in tribal under-five children (31.33%), followed by dental caries (21.20%), intestinal infections (19.20%), and respiratory infections (25.84%), while vitamin deficiencies (20.22%) and intestinal infections (17.98%) predominated in non-tribal counterparts. In comparison to the non-tribal population, tribes have a worse socioeconomic status, poorer nutritional status, and a higher prevalence of morbid conditions. Additional in-depth studies and surveys of the tribal community would be extremely beneficial.

**Keywords:** Morbidity, nutrition, non-tribal, tribal, economic vulnerability

## 1. Introduction

A tribe is an independent political division of a population characterized by a distinctive culture, primitive traits, and socio-economic backwardness.[1,2] Tribal people are primitive residents of any country. But, it is a glooming fact that even after six decades of independence the tribes of India are drowned in several problems. In those problems, the poor health status of tribals is now an important issue.[2] India is home to almost half the tribal population of the world with 84.33 million people classified as tribal, corresponding to 8.2% of the total population. There are 461 groups of tribes who are spread over 28 states and 8 Union Territories with majority of 87% of tribes found in central belt of the

country.[1] Reliable and comprehensive data on patterns and trends of diseases in tribal areas are required to monitor local epidemics and to assess the effectiveness of public health programs for prevention and control of diseases. Religious rites are used mainly to treat diseases and propitiating the deity concerned most of which tribals believe can cure the plagues, which are associated with various diseases.[3,4] No comprehensive strategy has been formulated to deal with tribal health problems, as there is not enough knowledge available on their customs, beliefs, and practices, which are intimately connected with the treatment of disease.[5,6] Further there is a broad understanding of health problems and morbidity of the general population, particularly of urban areas but studies pertaining to demographic



characteristics, health status of under 5 year tribal children among different tribal groups are very few, and there is lack of comparisons due to different criteria studies. Hence, the present study was carried out to evaluate the nutrition and health status of under 5 year tribal children and compare with nontribal counterparts.

## 2. Review of Literature

N P Rao, G Radhaiah, K M Rao, D H Rao (1994) Tribals in Madhya Pradesh's three ecological zones—Jhabua (West Zone), Bastar (South Zone), and Sarguja (East Zone)—were the subjects of a health and nutrition survey that took into account the relative economic contributions of agriculture, forests, and a mix of the two. Compared to Bastar and Sarguja, Jhabua preschoolers appear to consume fewer foods and nutrients overall. The prevalence of clinically evident Protein Energy Malnutrition and other vitamin deficiency symptoms was startlingly low. However, 4% of children in Sarguja exhibited signs of goitre. Both by extent and severity of malnutrition, the children of Jhabua appear to be worse followed by Bastar and Sarguja. In the developing countries infection and infestation are important factors involved in the causation of severe malnutrition among pre-school children consuming inadequate and ill balanced diet, Swaminathan, M., (1985). Prabhakara, G.N., Shivaram, C., and Aswath, P.V., (1984) conducted a study in four corporation blocks under the urban ICDS of Bangalore covering a population of 6272. It was found that there was an inadequate intake of all the nutrients except vitamin A in

ICDS areas. An age trend was observed in the incidence of malnutrition. The newborns were found to be below WHO reference standards on all parameters, Chopdar, A., (1979). Further, the age group of 7 - 24 months seemed to be the most vulnerable group, Behera, S.K., (1982). A few researchers reported that maximum malnutrition was prevalent in the age group of 0 - 3 years, Chopdar, A.,(1981), Lai, Sunder, (1979), Singhal, V.K., (1981), reported that majority of malnourished children were under two years of age followed by the 3-6 years age group. The incidence of malnutrition was also high in children with the birth order of four and above Bansai, S.M.,(1978). A few studies related to malnutrition threw light on rural-urban differentials and sex differences. The prevalence \* of severe malnutrition was highest among rural children (75.3%) followed by tribal (63.2%) and urban (57.6%) Tandon, B.N. (1984). Seventy eight per cent malnourished children belonged to low castes and 64 per cent to high castes, Jakher, R.S.,(1984). Studies conducted by Behera, S.K. (1982) and Chopdar, A.,(1979) revealed that physical parameters of male children were higher than those of female. The incidence of severe PEM (Protein

Energy Malnutrition) in female children was almost double as compared to male children because of negligence and sociocultural factors, Desai, B.R.,(1981). Devadas, R.P.,(1983) found prevalence of PEM to the extent of 20 per cent among female children and 14.5 per cent among male. Kamalnathan, G., (1984) was of the view that percentage of female children (53%) suffering from malnutrition was higher than that of male children (38%). Interesting seasonal variations were reported by Patel, R.B., (1982). The incidence of severe malnutrition was maximum from June to October as this was the period of incidence of malaria, skin infections, diarrhoea! diseases and other illnesses. Malnutrition predisposes children to infection and impairs the body's defence mechanism. Malnourished children have much higher mortality and morbidity rates. The fact that the health status of severely malnourished children is poor and incidence of diseases is high among them was corroborated by a study conducted by Tandon, B.N., (1984). Most of the children with severe malnutrition had one or more associated illness, diarrhea being the most common one. Udani, R.H., (1978) also observed that prevalence of illness was much more in severely malnourished children. Malnutrition as one of the causes of infant mortality had been reported in research studies conducted by Lal, Sundar., (1983), and Thakur, S., (1984).

## 3. Materials and Methods

The current cross-sectional study was conducted in March, India's forested areas, between March 2020 and January 2021. The institutional ethics committee of the Ganti Mohana Chandra Balayogi Medical College in Bhopal granted its approval. 18 tribal hamlets were randomly chosen among the 33 tribal hamlets that were present using a lottery sample procedure, where the 33 hamlets were serially numbered at random on 33 cards. The cards were expertly shuffled. The number of the drawn card was recorded. A new card was dealt, the deck was reshuffled, and another card was drawn. Up till there were 18 hamlets, the entire process was repeated. On being drawn a second time, the hamlet numbers that had already been chosen were not accepted. In line with this, the study included the nearby villages as non-tribal populations that made up the planned homogenous, mixed-race community. A previously tested structured interview schedule was used to collect data in the current study through house-to-house visits. Individual scheduling involved eliciting information about participants' age, sex, marital status, literacy status, occupation, personal habits, and health status; family scheduling involved eliciting information about the type of family, family organisation, socioeconomic status, and environmental conditions Hemoglobin estimation using Tallquist's method and peripheral smear testing were performed in our study's laboratory parameters, for



example: Malaria Detailed general and systemic examinations of all the systems of both tribal and non-tribal children were performed by the same group of competent doctors. Competent doctors mostly used the patient's history and clinical observations to diagnose morbid illnesses. Anthropometric measurements of height (cms) and weight (kg) of every person under the age of five who was being researched were taken. Due to the fact that this was a cross-sectional assessment of a forest region, only the aforementioned few laboratory parameters were evaluated. Statistics: Data were statistically analyzed using software Smith's Statistical Software Package version 2.80. Measures of central tendency were used to analyze the descriptive data. The standard normal test (Z) was used to compare the equality of proportions having specific type of diseases among tribal and non-tribal children.  $P < 0.05$  was considered to be statistically significant. Chi-square test ( $\chi^2$ ) was applied to test the difference in the proportion of nutritional status, morbidity status between males and females among both tribal as well as in non-tribal children.

### 3. Results

Table 1 depicts demographic characters among parents of under five children from tribal and nontribal population. A higher proportion of population belonged to nuclear family in both tribal (78.78%) and nontribal (58.38%) group and the literacy status was better in nontribal than tribal but number of people who finished more than secondary school was meager in both the groups. A higher proportion of population was working as general laborers and agricultural laborers in both the tribal and nontribal. Table 2 shows nutritional status of under five years old children. Tribal; Of the total 151 tribal under five children, 83 (54.97%) were normal and 68 (45.03%) suffered from malnutrition (protein energy malnutrition). About 48.44% female children compared to 42.53% male children suffered from protein energy malnutrition. A total of 7.35% of tribal children were severely malnourished (grade III and IV). Non tribal; Of the total 89 non-tribal under five children, 69 (77.53%) were normal and 20 (22.47%) suffered from malnutrition (protein energy malnutrition). About 24.53% male children than 19.44% female children counterparts suffered from protein energy malnutrition. Only 1 (5%) of non-tribal child suffered from grade III malnutrition. Table 3 shows the morbidity pattern of under five years old children. Tribal; Among morbidities reported in under five tribal children, skin infections were maximum (31.33%), followed by (21.20%) dental caries; (19.20%) intestinal infections; (21.85%) respiratory infections; and (10.6%) vitamin deficiencies. Non tribal; Among morbidities reported in under five non-tribal children, skin infections were (12.98%); (7.78%) dental caries; (17.98%) intestinal

infections; (25.84%) respiratory infections; and (20.22%) vitamin deficiencies. Figure 1 depicts that the main cause of morbidity among under five years old children in tribal population is due to skin infections, dental and intestinal infections while among nontribal children respiratory infections and Vitamin deficiencies form the major problem.

Table 1: Demographic characters among parents of under five years old children among tribal and non-tribal population

Variable	Tribal	Non-tribal
Total population Children <5 years	947	923
Type of Family	N=231	N=185
Nuclear	182 (78.78)	108 (58.38)
Joint	36 (15.59)	54 (29.19)
Extended	13 (5.63)	23 (12.43)
<b>Literacy status</b>		
1. Illiterate	609 (76.50)	450 (53.96)
2. <Primary schooling	81 (10.18)	77 (9.230)
3. Primary schooling	39 (4.90)	32 (3.84)
4. Middle school	48 (6.00)	109 (13.07)
5. Secondary school	15 (1.90)	140 (16.79)
6. >Secondary school	04 (0.50)	24 (2.88)
<b>Occupation status</b>	N=947	N=923
1. Service(government + private)	18 (1.90)	21 (2.28)
2. Self employment	12 (1.27)	10 (1.08)
3. Agriculturists	175 (18.48)	345 (37.38)
a. Owners	04 (0.42)	163 (17.66)
b. Laborers	171 (18.06)	182 (19.72)
4. Laborers	405 (42.77)	92 (9.97)
5. Housewives	22 (2.23)	120 (13.00)
<u>6. Others</u>		
(Figures in parenthesis indicate percent)		

Based on application of Chi-square test, nutritional disorders were more prevalent among females compared to males in both tribal as well as non-tribal population with ( $\chi^2 = 3.841$ ),  $P < 0.05$  of significance. However, there was no statistically significant difference in the proportion of all other morbidity status between males and females among both tribal as well as non-tribal population.



Table 2: Nutritional status of under five years old children

Nutritional status	Tribals (n=151)			Non tribals (n=89)		
	Male	Female	Total	Male	Female	Total
Normal	50 (50.57)	33 (39.06)	83 (54.97)	40 (62.26)	29 (55.56)	69 (77.53)
Malnourished( $\chi$ )	37 (42.53)	31 (48.44)	68 (45.03)	13 (24.53)	07 (19.44)	20 (22.47)
Grade I	27	23	50	12	05	17
Grade II	06	07	13	01	01	02
Grade III and IV	04	01	05	—	01	01

(Figures in parenthesis indicate percent) ( $\Psi$ )=protein energy malnutrition

### 5. Discussion

The present cross sectional study was carried among tribals and non-tribals residing at Bhopal district of Madhya Pradesh.

**Nutritional status of under five years children:** The present study revealed more of tribal children compared to non-tribal were suffering from protein energy malnutrition. Observations from our study revealed more of tribal (45.03%) children compared to non-tribal (22.47%) were suffering from protein energy malnutrition with  $P < 0.001$ . A total of 7.35% of tribal children were severely malnourished (grade III and IV), seen more in (10.81%) male children than (3.23%) female children. In a study conducted among

was found that normal healthy children were below 1% in this remotely placed inaccessible habitat. A total of 10% babies were grade I malnourished followed by 29, 37, and 18% as grade II, III, and IV, respectively. The grade IV malnourished children were 4% in which maximum mortality was due to diarrhoea. In entire study population it was noticed that 99% were malnourished below 5 year of age group in which female percentage was 51% compared to 49% of males ( $P > 0.05$ ). Under grade IV, male babies were on higher side than females ( $P > 0.05$ ). [7] Rao found that prevalence of protein energy malnutrition such as marasmus was higher (2.2%) in Jenukuruba tribal children than the (0.2%) rural Karnataka. [4] Rao found only one pre-school child of Onge tribal group was anemic. [4] Singh observed that two out of three of the under five children of tribals of Chotanagar were malnourished. [8] Rajalakshmi observed that among Santal tribe of Bihar, 74% of under five children and 66% of non-tribal under five children in same area were malnourished. One-third of both these tribal and non-tribal children suffered from severe malnutrition. [9] Morbidity status of under five years children: In the present study more of tribal under five children than non-tribal suffered from various morbid disorders. In a study conducted among Warli tribal children, Thane district, Maharashtra, India, it was found that Diarrhoea was observed to be maximum (37%) in grade IV babies followed by skin infections. The intestinal worms were common in all babies suffering from malnutrition. A total of 9% children had skin infections specifically on scalp of grade I babies. The other infectious diseases noticed were around (5%). [7] In another study diarrhoea was the main problem faced by children under 5 years of age followed by acute respiratory infection (pneumonia) being the second most common problem. [10] Rao found that 48% of pre-school children of Gond tribal community in Kundam block of Jabalpur district, Madhya Pradesh had intestinal parasitic infestations. [11]

Table 3: Morbidity pattern of under five children

Morbidity	Tribal (n=151)%	Nontribal (n=89) %	P value
Skin infections	31.33	12.98	<0.01
Dental disorders	21.20	7.78	<0.01
Intestinal infections	19.20	17.98	<0.05
Respiratory infections	21.85	25.84	<0.05
Vitamin deficiencies	10.6	20.22	<0.05

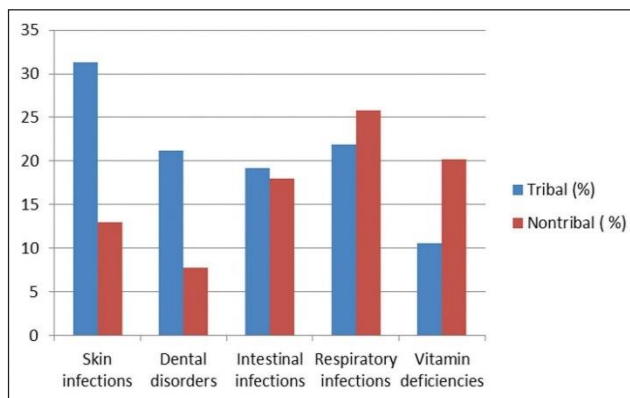


Figure 1: Morbidity pattern of under five years old children





## 6. Conclusion and Recommendation

Compared to non-tribal peers, tribal children under the age of five have low nutritional status and a higher prevalence of morbid illnesses, such as skin disorders and dental disorders. Tribals must be made aware of health issues, education, politics, economic opportunities, and how to achieve a higher quality of life. Further surveys regarding socio-demographic and health status data among tribal and non-tribal population will be invaluable for formulating a comprehensive strategy to deal with their health problems. We were compelled to perform a cross sectional study due to a lack of resources, time, and personnel. In contrast, a longitudinal research is a more accurate predictor of health issues in a study population.

It is necessary to develop and implement a thorough control strategy, especially for tribals with serious efforts for their overall development.

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