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Original Research Article

Prevalence of malnutrition in under five age group of the tribals in Wayanad district of Kerala, South India: a community based cross-sectional study

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ABSTRACT

Background: Malnutrition is one of the major causes for childhood mortality among under-five children in India. The tribal community accounts for 8.6% of India's population. In India, nutritional as well as socio-economic inequalities are most intensely experienced by the tribal population when compared with the rest of the population. The objective of the study is to estimate the prevalence of malnourishment among tribal children (0-59 months) in the Wayanad district of Kerala.

Methods: A community-based cross-sectional survey was conducted among 319 tribal children (0-59 months) of Noolpuzha panchayat, Wayanad district using a semi-structured, pretested questionnaire to collect the socio-demographic profile (age, gender, education, occupation, type of tribe, type of house, type of family) from mother/caretaker and anthropometric measurements (height, weight, and mid-arm circumference) was recorded and compared with WHO growth standards. Quantitative variables were summarized using the Mean (SD). Children below -2SD are considered malnourished in terms of being underweight, stunted, and wasted.

Results: The mean age of the children were 29 months±16 SD of which 168 (52.7%) were male, and 151 (47.3%) were females. The prevalence of underweight, stunting, and wasting was 175 (54.8%), 165 (51.7%) and 99 (31%) respectively of which 111 (34.7%) were severely underweight, 88 (27.6%) were severely stunted and 57 (17.8%) were severely wasted.

Conclusions: Malnourishment in the form of stunting, wasting, and underweight is very high among under-five tribal children of Noolpuzha panchayat resulting in the need for a multidisciplinary approach to identifying the reasons for malnourishment existing among these marginalized communities.

Keywords: Malnutrition, Prevalence, Tribals, Under five age children

INTRODUCTION

Malnutrition is one of the major public health problems in India and all-over developing countries, a major cause of mortality and morbidity in children. Children under five years of age are more vulnerable to malnutrition and infection.[1] Almost one out of every three children is undernourished especially during the critical first 1,000 days.[2,3] Globally, 149 million children under five years were stunted, 45 million were wasted, and 462 million were underweight.[4] As per the recent report of UNICEF, 4.7 million tribal children of India suffer from chronic nutritional deprivation where 40 percent of them are stunted with a higher prevalence of wasting at 21.5 percent.[5,6] According to the ministry of women and child development In India, state wise prevalence of undernutrition among children under-five years of age shows Kerala is one of the States with the lowest

prevalence of undernutrition.[7] Even though Kerala has a higher health indicator than other states in India, nutrition is not at its best in tribal areas. Wayanad, a district in Kerala with the largest tribal population of eight scheduled tribes residing and one of India's 250 poorest districts, showed 22.5% underweight, 31.3% stunting, and 16.1% wasting among under five years, tribal children.[8] Despite various Nutritional intervention Programmes over the past three decades, the status of these tribal populations is still differing, as their distinct culture, isolation, and remoteness made them vulnerable.[9] The present study aimed to Estimate the prevalence of malnourished children (0-59 months), and also to determine the Socio-demographic factors associated with malnutrition among tribal children of Noolpuzha Grama Panchayat, Wayanad.

METHODS

A cross-sectional study was conducted from September to November 2021, among tribal children (0-59 months of age) in Noolpuzha panchayat of the Wayanad district, Kerala. The Wayanad district is home to the largest tribal population in Kerala, which is located in the north-eastern part of the state, on the Western Ghats. In Kerala, among 36 notified tribes, eight scheduled tribes are residing here. The Paniyar tribe is one of the most populous, along with other tribes like Kurumar, Kattunaikar, Kurichiyans, Cholanaikkar, and Urali, who also reside in the Wayanad district.

The Sample size was estimated using the formula;

$$N = (Z2 \times PQ) \times 2/\Delta 2$$

With the anticipating prevalence of stunting among the tribal population to be 40% and the lowest expected prevalence was 32% with the design effect of two the sample size required was 300. All children in tribal colonies of age group 0-59 months were included. Data collection was conducted by using the cluster sampling technique. A total of 215 tribal colonies were registered in the Tribal welfare office of Noolpuzha Grama Panchayat. Out of which eighty-five clusters were covered and all 319 children of 0-59 months of age were examined clinically and anthropometric measurements were recorded according to WHO/NCHS child growth standards. Information on sociodemographic characteristics was collected using a pre-tested questionnaire with the help of tribal promoters, who are the voluntary workers being appointed by the government tribal welfare office. The height and weight of each child were compared with WHO growth standards. The necessary Z score was calculated using WHO Anthro software version 3.2.2, from which children below -2SD are considered malnourished in terms of underweight, stunted, and wasted.[10] The data were analyzed using SPSS 25.0 software package (IBM Corp., Armonk, NY, USA). We summarized qualitative variables, such as the prevalence of underweight, stunting, and wasting using percentage and proportions and qualitative variables such as weight and height by mean (SD).

Table 1: WHO classification of malnutrition based on Z-score.

Z score value	Nutrition classification
<2 to >-1	Normal
<-1 to >-2	Mild undernutrition
<-2 to >- 3	Moderate undernutrition
<-3	Severe undernutrition

RESULTS

A total of 319 children in the age group of 0 to 59 months, half of them were males with 52.7% and predominantly belonging to the age group of 12-23 months and 37-48 months with 21.9%.

Table 2: Socio-demographic characteristics of the children (n=319).

Socio demographic variables		N	%
Age (months)	Less than 12	63	19.7
	12-23	70	21.9
	24-36	67	21
	37-48	70	21.9
	49-59	49	15.4
Gender	Male	168	52.7
	Female	151	47.3
Birth order	One	111	34.8
	Two	56	17
	Three	40	12.6
	More than 3	112	35.1
Place of delivery	Home delivery	15	4.7
	Hospital delivery	304	95.3
Distance to the nearest health facility (km)	Less than 3	128	40.1
	1-3	150	47
	More than 3	41	12.9
Type of tribes	Paniyar	149	15.7
	Kurumar	41	12.9
	Kattunaikar	102	32.0
	Urali	27	8.5
Type of house	Kutcha	27	8.5
	Semi pucca	242	75.9
	Pucca	50	15.0
Type of family	Nuclear family	142	44.5
	Joint family	177	55.5

The mean standard age of the children included in the study was 29.07 months±16 SD. Mothers were educated mostly up to secondary level education (33.9%) whereas majority of fathers had primary level education (36.7%). A total of 90.9% fathers were employed, whereas 67.7%

mothers were homemakers. Weight of age (underweight) and height of age (stunting) were predominant than weight for height (wasting) among the children of Noolpuzha (Table 2). Association between the variables and malnutrition using Pearson Chi-Square test. Breast feeding duration, gender and type of tribes had statistical significance ($p<0.05$) with underweight, stunting and wasting respectively (Table 3).

Table 3: Distribution of study population according to the WHO classification of malnutrition.

Malnutrition	Moderate (-2 SD to -3 SD) N (%)	Severe (-3 SD) N (%)	Total N (%)
Weight for age (underweight)	64 (20.1)	111 (34.7)	175 (55)
Height for age (stunting)	77 (24.1)	88 (27.6)	165 (51.7)
Weight for height (wasting)	42 (13.2)	57 (17.8)	99 (31)

DISCUSSION

A prevalence of underweight above 30% and wasting above 10% are considered serious public health problems.[11] The study revealed that undernutrition was substantially higher in under five age group tribal children in Noolpuzha with the prevalence of underweight, stunting, and wasting being 175 (54.8%), 165 (51.7%), and 99 (31%). Out of the total, 111 (34.7%) were severely underweight, 88 (27.6%) were severely stunted, and 57 (17.8%) were severely wasted. Supported by similar studies carried out by Philip et al and Ladish Krishnan et al in Wayanad showing the prevalence of underweight, stunting, and wasting as 39%, 38%, 20.5%, and 54% 41.3%, and 10.5% respectively.[12,13]

Malnourishment was prevalent in the age group 24-36 months. Underweight and stunting were predominantly seen among males which are in accordance with few other studies where boys were predominantly undernourished than girls but contrary to the higher prevalence observed in girl children universally.[14-18] A nutritional survey among tribals of Kerala conducted by The National Nutrition Monitoring Bureau in 2017 before our study also showed a higher prevalence of underweight (17%) and stunting (23.1%).[19] Kerala has the lowest proportion of children with underweight (22.5%), stunting (31.3%), and wasting (16.1%) and hence these high figures among under-five children speak of the deprivation of this marginalized community.[8]

However, malnutrition among the tribes of Wayanad was much lesser than in other tribes of the nation; underweight 69.3%, stunting 63.4%, and 58.7 (13)% wasting.[20,14,21] The present study shows children with exclusive an breastfeeding duration of less than six months have more chance of getting malnourished (underweight) compared with children of more than six months, which is found to be statistically significant.[15] The study also identifies that about 7.2% of newborn infants were deprived of extremely nutritious first milk (colostrum) whereas National Family Health Survey-5 data reported that 60% of children under 3 years of age were breastfed within one hour. [8]

Table 4: Nutritional status of children by socio demographic characteristics.

Age group (months)	Underweight N=175 Frequency (%)	Stunting N=165 Frequency (%)	Wasting N=99 Frequency (%)
Age group (months)			
Less than 12	37 (11.6)	31 (9.7)	22 (6.9)
12-23	35 (11)	32 (10)	23 (7.2)
24-36	38 (12)	42 (13.2)	18 (5.6)
37-48	38 (12)	38 (12)	19 (6)
49-59	27 (8.5)	22 (6.9)	17 (5.3)
P value	0.886	0.240	0.754
Gender			
Female	78 (24.4)	66 (20.7)	39 (12.2)
Male	97 (30.4)	99 (31)	60 (18.8)
P value	0.276	0.007	0.057
Mother literacy			
Illiterate	22 (6.9)	23 (7.2)	14 (4.4)
Primary	53 (16.6)	41 (12.8)	31 (9.7)
Secondary	57 (17.9)	62 (19.4)	32 (10)
Higher secondary	43 (13.5)	39 (12.2)	22 (6.9)
P value	0.580	0.284	0.951
Father literacy			
Illiterate	27 (8.4)	23 (7.2)	21 (6.6)
Primary	67 (21)	62 (19.4)	43 (13.4)
Secondary	62 (19.4)	62 (19.4)	26 (8.2)
Higher secondary	19 (5.9)	18 (5.6)	9 (2.8)
P value	0.797	0.427	0.068
Birth order			
1	61 (19.1)	56 (17.6)	33 (10.3)
2	61 (19.1)	59 (18.5)	32 (10.3)
3	36 (11.3)	28 (8.8)	25 (7.8)
≥4	17 (5.3)	22 (6.9)	9 (2.8)
P value	0.214	0.927	0.086
Exclusive breast-feeding status (months)			
<6	76 (23.8)	66 (20.7)	37 (11.6)
>6	99 (31)	99 (31)	62 (19.4)
P value	0.026	0.431	0.891
Type of tribes			
Paniyar	74 (23.2)	75 (23.5)	44 (13.8)
Kurumar	23 (7.2)	26 (8.15)	10 (3.1)
Kattunaikar	59 (18.5)	48 (15)	41 (12.85)
Urali	19 (6)	16 (5)	4 (1.25)
P value	0.200	0.277	0.040

CONCLUSION

The prevalence of malnutrition among tribal children is higher than the nontribal children of Kerala. Their nutritional status, however is better than tribal children in other states of the country, suggesting that the state's public health are better. Chronic malnutrition is evident among the children as the prevalence of stunting is significantly high in the present study which shows that there is a need to improve health care services to tribal children. The evidence from this article is a pointer for health care providers to look into the hidden morbidities of malnourished children existing in marginalized communities.

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