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Nutritional Status and Its Association with Various Socio Demographic Variables among Preschool Tribal Children in Kerala

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Abstract

Objectives: *To study the nutritional status of pre-school tribal children, to compare with the non-tribal children and to identify its association with selected socio demographic variables.*

Methods: *A Descriptive Cross Sectional Study was conducted from December 2014 to June 2015, spanning 40 days in 20 randomly selected anganawadis in Mananthavady ICDS block in Wayanad district of Kerala state. 469 children participated in the study. Weight, height, mid arm circumference were measured using standardized instruments. Socio demographic data were collected using structured questionnaire. Children more than two standard deviations (SDs) below the standard median of the WHO MGRS were considered underweight, stunted, and wasted respectively. Percentages, means and associations were determined using PASW software.*

Results: *469 children (228 tribal and 241 non-tribal) were analyzed. The prevalence of underweight, stunting and wasting was 62%, 41% and 43% respectively compared to 35%, 37% and 21% among non tribals. 88% of tribal children had significant pallor. Significant association was found between malnutrition and the tribal community, gender, past illnesses, timing of delivery, birth weight, time of initiation of complementary feeds, number of family members, educational status of mother and parental habits (smoking/ alcohol consumption).*

Conclusion: *Malnutrition in the form of stunting, wasting and underweight is extremely high among the tribal preschool children, especially girls when compared to boys. Micronutrient deficiencies are also rampant among these children. This degree of malnourishment is beyond any acceptable limits and hence further interventions and policies should be made based on the study to make health care services sensitive to the needs of the tribals.*

Keywords: *Underweight; Stunting; Wasting; Tribal; Pre-school; Wayanad; socio-demographic variables.*

Introduction

Adequate nutrition during infancy and early childhood is fundamental to the development of each child's full human potential. Nutrition reduces the susceptibility to infections and its related morbidity, disability and mortality and it

enhances productivity. Under nutrition should be prevented as early as possible to reduce irreversible growth and development deficits that compromise child health. Depriving proper nutrition may disable a person, reducing his/her productivity. Nutrition is also crucial for the fulfillment of human rights – especially those of the most vulnerable children, girls and women, locked in an intergenerational cycle of multiple deprivations.[1]

Tribal Population in India as defined by Article 366 (25) of the Constitution of India refers to those communities, who are scheduled in accordance with Article 342 of the Constitution. "Nourishing India's tribal children" [2] which was published by the UNICEF, states that Tribal community in India are the most nutritionally deprived community in India and have a poverty rate of 20%, which was similar to general populations 20 years ago.

Wayanad is primarily a rural district with tribal population of around 18.53 per cent, which is the highest in Kerala. Wayanad district houses the maximum number of tribal people in Kerala and in Wayanad, Mananthavady ICDS block was selected as it is the largest ICDS project in the district and no previous similar studies were conducted in this region. This study was an attempt to reveal the nutritional status among preschool tribal children in Mananthavady block, to compare with the nontribal children of the same region and its association between selected socio demographic variables.

Aims and Objectives

1) To study the nutritional status of pre-school tribal children.
2) To compare with the non-tribal children of the same age group residing in the same area.
3) To identify the association between nutritional status of preschool tribal children and selected socio demographic variables.

Materials and Methods

Research Design: Descriptive cross sectional study

Setting of the study: Wayanad district stands first in the case of tribal population (about 31 percent) among other districts in Kerala State. They form 18.5 percent of the total population of the district and the highest in the state. Mananthavady ICDS block in Wayanad district was chosen for the study as it has one of the highest populations of tribal communities in the district. (20.4%)

Study period Anganawadis were visited from December 2014 to June 2015, spanning 40 days.

Study population Children falling within the age group of 3-6 years attending anganawadi constituted the study population.

Selection of anganawadi centers The total number of Anganawadi centers in Mananthavady ICDS project is 131. Out of these, 20 centers were randomly selected through a random number generator after providing serial numbers for each anganawadi.

Sample Size Sample size was calculated by the formula n= 4pq/d2, after taking estimated prevalence as 30% [NFHS Kerala], precision level as 6%, design effect 1.5%. The 42 estimated sample size was 330, which was increased to 400 for accounting for nonresponse.

Inclusion Criteria All children attending the anganawadi aged between 3 and 6 years were included for the study.

Exclusion Criteria Children who were previously diagnosed as sickle cell anemia were not included for peripheral smear examination.

Data Collection The survey was completed in 40 days spanned over a period of 1year. Two days were allotted for each anganawadi centre. The randomly selected 20 anganawadis were visited with the help of CDPO from the local area in the vehicle arranged by them. Data were collected by anganawadi visits with the help of the anganawadi workers and staffs in Mananthavady ICDS project, interviewing mothers, referring immune-zation cards and relevant clinical examination. Data were collected personally and after each

day's survey, it was checked for accidental errors. 469 children participated in the study. The height was measured using a standardized portable stadiometer with a fixed vertical backboard and an adjustable headpiece to the nearest 0.1 cm. The weight of the child in kilograms was measured using Salter digital body weight scale model 9000. Weight was recorded to the nearest 0.1 kg. Mid arm circumference and head circumference were measured using a standard non stretchable tape to the nearest 0.1cm.

Data analysis The collected data were entered in Microsoft Excel and PASW Statistics 18 software for windows. Calculation of means and proportions of the outcome against major dependent variables were done for preliminary analysis. Chi squared test was used to explore statistical significance wherever appropriate.

Study Proforma The forms used for survey include: 1. Identification data form 2. Nutrition assessment form 3. Diet chart 4. Consent form

Results

Table 1 Sample characteristics

Characteristics	Frequency	Percentage
Caste		
Tribal	228	49
Non-tribal	241	51
Gender		
Boy	259 (Tribal 130)	55 (Tribal 57)
Girl	210 (Tribal 98)	45 (Tribal 43)

Distribution of sample based on the prevalence of malnutrition among tribal children

(n=228)

Gender	Underweight	Stunting	Wasting
Male (n= 130)	69 (53%)	42 (32.3%)	40 (30.7%)
Female (n= 98)	71 (72.4%)	52 (53%)	58 (59%)
Total (n= 228)	140 (62%)	94 (41%)	98 (43%)

Distribution of sample based on the prevalence micro nutrient deficiency by clinical examination
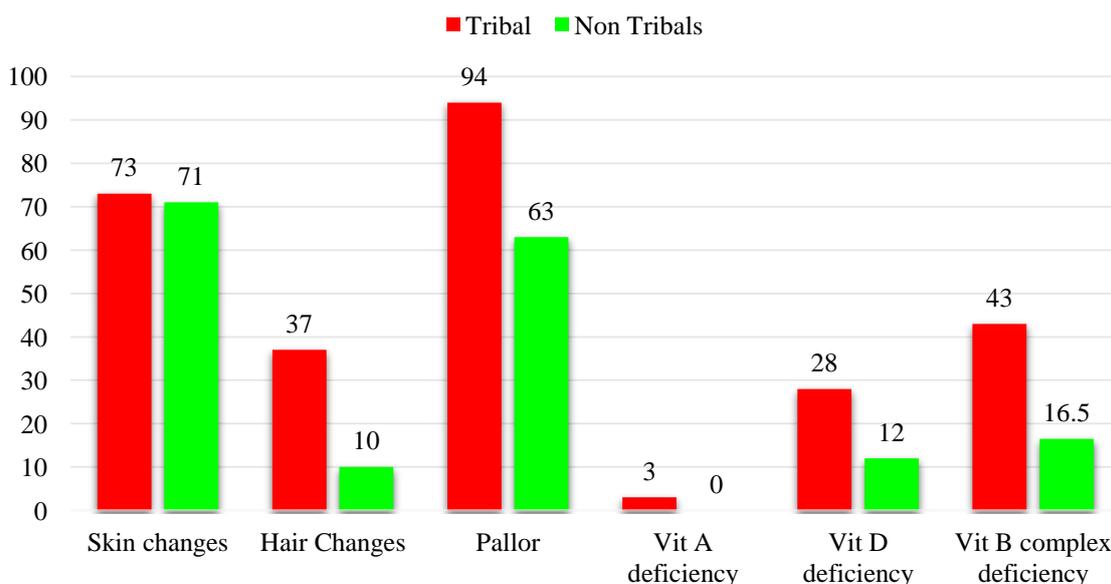
Table 3 Association of under nutrition and various socio demographic variables.

FACTORS	chi-square test	Df	p value
Gender	4.375	1	0.036*
Term	21.285	1	<0.001***
Birth weight	19.542	1	<0.001***
Past illnesses	3.458	2	0.177
Duration of breast feeding	4.690	2	0.096
Time of initiation of CF	3.202	1	0.076
Number of family members	4.272	1	0.039*
Educational status of mother	37.255	3	<0.001***
Father's addiction (Smoking/ Alcohol)			<0.001***
Immunization status	1.829	1	0.176

*significant at 0.05 level, **significant at 0.01 level and *** significant at 0.001 level.

469 children of age group 3-6 years were included in the study, of whom, 49% belonged to tribal community. Among the tribal community, 57% were boys. More than half (62%) of the tribal children and 35% of non-tribal children were underweight. It was found that 41% of the tribal children and 37% of the non-tribal children were having height less than 2 SD based on the WHO standards. Wasting was evident in 43% of tribal children and 21% of non-tribal children. Chi-squared test showed significant association between tribal communities and all the three above mentioned parameters.

72.4% of tribal girls are underweight compared to 53% of boys. Prevalence of stunting and wasting were 53% and 59%, respectively among tribal girls compared to 32.3% and 30.7% among tribal boys.

28% of the tribal children and 16% of non-tribal children had mid arm circumference <13.5cm. Microcephaly was seen in 12 tribal children and none among non-tribal children in the selected sample.

Pallor was seen in most of the (94%) tribal children, skin changes of malnutrition in 73% and hair changes in 37%. Clinical features of vitamin A deficiency were seen in 3%, vitamin D deficiency in 28% and vitamin B complex deficiency in 43% of tribal children which were significantly more than those seen among non-tribal children.

Most of the deliveries (94.8% & 95.9%) were term deliveries among tribal and non-tribal communities.42.5% of the total deliveries among tribal children were born low birth weight and only 17% were low birth weight among non-tribal communities. Exclusive breast feeding for 6 months of age were seen in more than half of the children of both communities. 100% of tribal children were breast fed for more than 2 years. Ragi and amritham mix were the most common complementary food given. Half of the tribal mothers were illiterate while 100% of mothers belonging to other communities had received primary education and above. 58% among the tribal community had >5 people living in the same home. Smoking, alcohol consumption and other substance abuse among fathers were seen in 92% of tribal community and 63% of other communities. Sickle cell disease was seen only among tribal community, which amounts to 5.2%. There was significant correlation between malnutrition and female gender, preterm delivery, low birth weight, overcrowding, educational status of mother and fathers addiction, among tribal community.

Discussion

The demographic details of the sample revealed that a significant proportion of the people belonging to the Mananthavady ICDS block belonged to the tribal community. The prevalence of underweight, stunting and wasting was significantly high among tribal communities when compared to others. 62% of tribal children were underweight when compared to 35% among others, which takes into account both chronic and acute undernutrition. 41% of tribal children had

stunting compared to 37% among others, which indicates that they have been undernourished for some time. Wasting was seen in 43% of tribal children and 21% of others, which may result from inadequate recent food intake or a recent illness. Undernutrition was more evident among girls when compared to boys. 53.3% of girls were having weight for age <2SD, while it was 43.6% among boys.

NFHS-3[3] data shows percentage of underweight, stunting and wasting as 43, 48 and 20%. It is higher when the study was conducted among tribals alone, 55% underweight and 54% stunting. The data from Kerala showed the prevalence of underweight and stunting to be 27.6% and 31% respectively. Analyzing these data, we can come to the conclusion that the prevalence of underweight among the tribal children in Mananthavady is significantly high when compared to the states average. Even though Kerala have made progress by leaps and bounds in the field of health, the tribal population is still left behind. The situation is the same in India as a whole. The prevalence of underweight among the tribal community is similar when we compare the national data.

The situation is slightly better when stunting is compared. The national prevalence of 54% among tribal children is significantly high compared to 40.5 % in Attapady and 41% in our study, indicating significant long term malnutrition among the tribal population in rest of the country. Even though stunting among the tribal communities of Kerala is less compared to national data, it is significantly more when compared to the state prevalence (30%), denoting we are still far away from our goal of achieving reduction of stunting among tribal children.

Another study, conducted in 2014 in Karnataka [4], about the nutritional status of under-five tribal children concluded that the prevalence of underweight, stunting and wasting was 60.4 %, 55.4% and 43% respectively. Similar study conducted in Maharashtra in 2012 found out that the prevalence of underweight, stunting and

wasting was 64, 61 and 29%, respectively and the risk of underweight was 1.7 times higher among children of illiterate mothers and those suffering from morbidities[5].

Observations made in the majority of the reviewed literature were consistent with the results obtained in the present study. It is concluded that under nutrition in the form of stunting, wasting and underweight is extremely high among the tribal preschool children, especially girls when compared to boys, and there is an urgent need to improve health care services to the tribal population and tribal children across the district.

The food intake pattern was poor. Boiling was the preferred method of cooking in most of the families. Pulses and other nutrient rich foods were not included in daily meals. Green leafy vegetables and other vegetables such as brinjal, beans, cabbage, carrot and drumstick were consumed only once a week. Fruit, milk, fish and meat were consumed only rarely. As a result, nutritional deficiency symptoms such as angular stomatitis, bleeding gums, glossitis, chielosis, koilonychias and pallor were observed among the population. The dietetic survey in our study revealed that most of the children were not taking micronutrient rich food in the form of green leafy vegetables, fruits and nuts, and those who are consuming were not getting the required quantity. Due to difficulty in recalling the consumed food, the actual calorie and protein intake measurement could not be assessed properly

Clinically pallor was evident in 94% of tribal children and in 63% of non tribals. It is significantly high compared to the national prevalence of 72% in rural India, and 44.5% in Kerala. The status of tribal children in Mananthavady seems to be far removed from that of the rest of the Kerala. It is clear that the chief cause of anemia is nutritional as evident by our nutritional survey. Since hemoglobin estimation and complete hemogram was not available, clear diagnosis of iron deficiency could not be made. Sickle cell anemia is another cause of anemia in this population and in order to distinguish between

different forms of hemolytic anemias, modern laboratory tests including HPLC are needed.

Stunting and underweight had significant association with the caste, gender, timing of delivery, birth weight, overcrowding, educational status of mother and paternal habits (smoking/ alcohol). Timing of initiation of complementary feeds and past illnesses had significant association with stunting alone. Tigga Pushpalata *et al*[6] conducted a socio demographic study to determine the association of malnutrition with different socio-economic and socio-demographic variables and concluded that the prevalence of wasting was as high as 62.3% in boys and 63.3% in girls (p>0.05). The age, gender, birth order, area (rural), maternal education, household income and mothers' age were significantly associated with the prevalence of wasting which was analyzed by logistic regression (p<0.05). This was similar to the results obtained in our study.

Conclusions

Degree of malnutrition is beyond any acceptable norms and needs to be tackled immediately. The situation is similar when compared with the nutritional status of tribal communities across India, and far worse than the overall nutritional status of pre-school children in Kerala.

The problem of severe under nutrition and anemia among the tribal children has deep socio-economic and structural roots. The solution has to be long term, addressing their issues which would be economic and social empowerment through land redistribution, asset transfer, education and employment in the government and nongovern-mental sectors. Even while addressing these, short term medical solutions should not be neglected.

Despite the efforts of Dept. of Health & Social Justice of the state in implementing policies for improving the health of tribal children, our study shows that there are considerable numbers of tribal children who are still far away from having an acceptable nutritional and health status. Hence, further interventions and policies can be made based on the study which can make health care services sensitive to the needs of the tribals.

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