

NUTRITIONAL STATUS OF UNDER-FIVE CHILDREN OF TEA TRIBE POPULATION IN JORHAT DISTRICT OF ASSAM

Paediatrics

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ABSTRACT

Background : Under nutrition is considered as major public health problem that closely associated with child mortality rates. The survivors of under nutrition have its pervasive effects that include acute morbidity as well as long-term impairment of cognitive & social development, physical work capacity, productivity and economic growth. **Aims and Objectives :** To assess the nutritional status of under-five children of tea tribe population and to determine the relation of the selected demographic and socioeconomic risk factors to malnutrition. **Materials and methods :** It was a community based cross-sectional study. Study population were selected after meeting the inclusion and exclusion criteria, which constituted 350 children of 6 months to 5 years. Multistage sampling method was used for the selection of sample size. **Results :** The study revealed prevalence of underweight, stunting and wasting as 52.9%, 38.3% and 37.1% respectively which is significantly higher when compared to state and national surveys. Overall prevalence of undernutrition was 62.85%. There was statistically significant association between birth order, mother's occupation, low birth weight, delayed complementary feeding to underweight. Mother's education had significant association with malnutrition. Factors like Socioeconomic status, low birth weight, delayed complementary feeding had significant association with stunting. **Conclusion :** The present study findings reinforce the importance of proper infant and child feeding practices, timely introduction of complementary feeds, appropriate maternal care, and female literacy in reducing the burden of malnutrition in these vulnerable group. Concrete steps need to be taken to raise their socioeconomic living condition.

KEYWORDS

Tea tribe, Wasting, Underweight, Stunting, Multistage sampling, Under-five

INTRODUCTION

Proper nutrition is essential for the physical and mental growth of the child. Healthy children of today will become healthy citizens of tomorrow. Nutrition during the first sixty months of life has an impact not only on growth and morbidity during childhood, but also has a profound impact on their physical and mental development and on their health status as an adult.¹ Evidence shows that most of the damage caused by malnutrition happens either when child is in the womb or in the first two years of life. Most of the impairment to brain development and future productivity in these early months of life is irreversible.² Nutritional deficiencies leads to various morbidities, which in turn, may lead to increased mortality. Under nutrition is regarded as major public health problem that is closely associated with mortality rate among under-5 children.

Severe malnutrition shows only the tip of the iceberg. Many suffer from invisible PEM which is difficult to monitor and makes prevention and cure difficult. It has been estimated that for every diagnosed case of PEM, there are 10 others with borderline malnutrition, undetected in the community.³

Tea garden population constitutes approximately 1/5 th of Assam state population.⁴ Poor socioeconomic conditions, ignorance due to illiteracy, overcrowded and unhygienic living conditions in the residential colonies make tea garden population vulnerable to various medical conditions and malnutrition.⁵ Out of the children getting hospitalized to JMCH for severe acute malnutrition, majority are from tea tribe population.⁶

In the present study an attempt has been made to assess the nutritional status of under-five children of Tea Tribe Population in Jorhat District of Assam.

AIMS AND OBJECTIVES :

- To assess the nutritional status of under-five children of tea tribe population in Jorhat District of Assam.
- To determine the demographic, socioeconomic and dietary risk factors for protein energy malnutrition in under-five children from tea tribe population of Jorhat District in Assam.

MATERIALS AND METHODS

Place of Study : Tea estate, Jorhat, Assam

Duration of study : One year (June 2021-may 2022)

Design of the study : Community based cross sectional study

Study population : All children in the age group under 5 years from tea tribe population, Jorhat, Assam

Sample size : According to NFHS 5, prevalence of underweight in Jorhat, Assam is 33.2%

Using the formula given by Daniel⁷:

- $n = Z^2 p (1-p) / d^2$
- Where, n = sample size,
- Z = Z statistic for a level of confidence taken as 4
- P = expected prevalence or proportion as 33.2%
- d = precision rate as 0.05

From the calculation, It was found that a minimum sample size of 350 children is required for this study.

Inclusion Criteria

- Children of age group 6 months to 5 years from tea tribe population, Jorhat, Assam
- Parents giving consent to take part in the study.
- From one family only one child will be surveyed.

Exclusion Criteria

- Children with serious illness like malignancy, congenital immunodeficiency, HIV etc
- Children whose parents are not present during the visit.

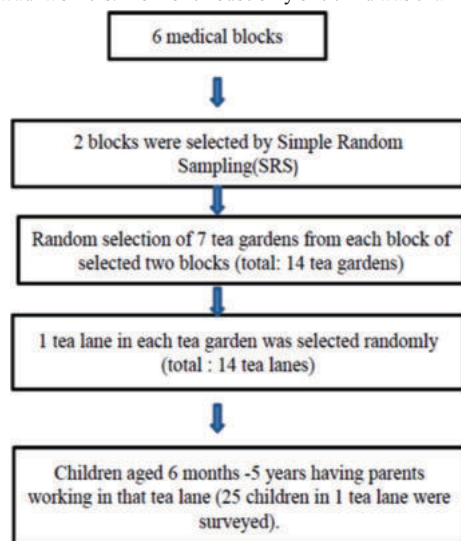
METHODOLOGY:

Sampling Method : Multistage Sampling.⁸

Out of total 6 medical blocks, 2 blocks were selected randomly as first stage unit. Each block contains on an average 20 tea gardens. 30% of tea gardens (7 Tea gardens) in each block were opted randomly for the study. Out of each tea garden 1 tea lane was selected randomly and survey was done for children aged 6 months to 5 years by house to house visit till the desired sample was attained.

After taking written consent from parents, data were obtained by

directly interviewing them and examining the child for necessary information. Data collected was put in predesigned proforma using questionnaire which includes general information, anthropometry, sociodemographic factors, birth history and feeding practices. Socioeconomic status was calculated using modified BG prasad classification for May 2021. Age was confirmed either by parents or anganwadi workers. From one house only one child was examined.



The indices of nutritional status like weight for age, height/length for age and weight for height/length were compared with the WHO growth charts for particular age and sex. Commonly used protein energy malnutrition indicators namely stunting, underweight, wasting and mid upper arm circumference were used to evaluate the growth status of children. The anthropometric measurements were taken following the standard techniques recommended by Jelliffe.^{9,10}

Statistical Analysis

Data was entered into Microsoft excel data sheet and was analysed using SPSS for Windows (Statistical Presentation System Software, SPSS Inc.) version 17.0. Tables were used to graphically represent data. Chi-square test was employed for comparing categorical variables.

Statistical Software: MS Excel, SPSS version 17.0 was used to analyse data.

Ethical Clearance

Ethical clearance was obtained from Institutional Ethics Committee(IEC) of Jorhat Medical College and Hospital, Jorhat prior to the commencement of study.

RESULTS AND OBSERVATIONS

Nutritional Status of Study Population

Distribution of study population based on nutritional status as per various anthropometric indices.

Parameter	Outcome	Frequency	Percentage
Weight for age	Normal	165	47.1 %
	Moderate Underweight (>-3SD to <-2SD)	101	28.9 %
	Severe Underweight (<-3SD)	84	24.0 %
Height for age	Normal	216	61.7 %
	Moderate stunting (>-3SD to <-2SD)	78	22.3 %
	Severe Stunting (<-3SD)	56	16.0 %
Weight for height	Normal	220	62.9 %
	Moderate wasting (>-3SD to <-2SD)	76	21.7 %
	Severe Wasting (<-3SD)	54	15.4 %
Mid Upper Arm Circumference (MUAC)	Normal (>13.5 cm)	230	65.7 %
	Moderate malnutrition (11.5-13.5cm)	103	29.4%
	Severe malnutrition (<11.5cm)	17	4.9%

As per **weight of age** analysis, **prevalence of underweight** among children aged 6 months to 5 years was found to be **52.9% (47.7% - 58.1%)**. 47.1 % of study subjects were found to be within normal weight range while among the remaining subjects 28.9 % showed moderate underweight and 24 % showed severe under weight.

As per **height of age** analysis, **prevalence of stunting** among children aged 6 months to 5 years was found to be **38.3% (33.2% - 43.4%)**. 62.9 % of study subjects were found to be having height within normal range while among the remaining subjects 22.3 % showed moderate stunting and 16 % showed severe stunting.

As per **weight of height** analysis, **prevalence of wasting** among children aged 6 months to 5 years was found to be **37.1% (32.0% - 42.2%)**. 65.7 % of study subjects were found to be having weight for height within normal range while among the remaining subjects 29.4 % showed moderate wasting and 4.9 % showed severe wasting.

As per **Mid upper arm circumference (MUAC)** measurement, **prevalence of malnutrition** among children aged 6 months to 5 years was found to be **34.3% (29.3% - 39.3%)**.

Nutritional status of children and its association with selected factors

Variable	Characteristics (No.)	Underweight	Stunting	Wasting
Gender	Male (141)	69(48.9%)	53(37.6%)	56(39.7%)
	Female(209)	116(55.5%)	81(38.8%)	74(35.4%)
P Value		0.232	0.826	0.413
Religion	Hindu (319)	170(53.3%)	124(38.9%)	118(37.0%)
	Christian (14)	6(42.9%)	4(28.6%)	6(42.9%)
	Muslim (17)	9(52.9%)	6(35.3%)	6(35.3%)
P Value		0.746	0.715	0.894
Age (in years)	< 1 year (50)	22(44.0%)	20(40.0%)	18(36.0%)
	1-2 years(81)	42(51.9%)	34(42.0%)	28(34.6%)
	2-3 years(92)	45(48.9%)	27(29.3%)	29(31.5%)
	3-4 years(73)	47(64.4%)	32(43.8%)	33(45.2%)
	4-5 years(54)	29(53.7%)	21(38.9%)	22(40.7%)
P value		0.193	0.331	0.429
Family Size	≤3 (106)	57(53.3%)	41(38.3%)	36(33.6%)
	4-5 (198)	104(52.8%)	81 (41.1%)	79(40.1%)
	> 5(46)	24(52.2%)	12(26.1%)	15(32.6%)
P value		0.992	0.168	0.426
Socioeconomic status	Class III (42)	19 (10.27%)	15(11.19%)	11(08.46%)
	Class IV (183)	94(50.81%)	59(44.03%)	67(51.54%)
	Class V (125)	72(38.92)	60(44.78%)	52(40.00%)
P value		0.321	0.019*	0.198
Birth Order	1 (188)	103(54.8%)	67(35.6%)	67(35.6%)
	2 (143)	67(46.9%)	56(39.2%)	52(36.4%)

	≥3 (19)	15(78.9%)	11(57.9%)	11(57.9%)
P value		0.02*	0.158	0.155
No of children in family	1 (143)	79(55.2%)	51(35.7%)	52(36.4%)
	2 (168)	82(48.8%)	69(41.1%)	64(38.1%)
	≥3 (39)	24(61.5%)	14(35.9%)	14(35.9%)
P value		0.271	0.588	0.938
Mothers age at time of pregnancy	< 20 years (84)	50(59.5%)	37(44.0%)	35(41.7%)
	20- 30 years (254)	129(50.8%)	93(36.6%)	91(35.8%)
P value		0.373	0.448	0.607
Type of family	Joint (84)	52(61.9%)	30(35.7%)	33(39.3%)
	Nuclear (266)	133(50.0%)	104(39.1%)	97(36.5%)
P value		0.057	0.578	0.641
Father's Education	Illiterate (106)	66(62.3%)	46(43.4%)	45(42.5%)
P value	Literate (244)	119(48.8%)	88(36.1%)	85(34.8%)
		0.020*	0.195	0.175
Mother's Education	Illiterate (128)	97(75.8%)	73(57.0%)	64(50.0%)
	Literate (222)	88(39.6%)	61(27.5%)	66(29.7%)
P value		0.001*	<0.001*	<0.001*
Father's Occupation	Unemployed(7)	5(71.4%)	2(28.6%)	5(71.4%)
	Employed(343)	180(52.5%)	132(38.5%)	125(36.4%)

P value		0.454	0.712	0.107
Mother's	Unemployed(236)	115(48.7%)	93(39.4%)	85(36.0%)
Occupation	Employed(114)	70(61.4%)	41(36.0%)	45(39.5%)
P value		0.03*	0.535	0.531
Gestational	Preterm(26)	16(61.5%)	14(53.8%)	9(34.6%)
Age	Term(324)	169(52.2%)	120(37.0%)	121(37.3%)
P value		0.357	0.090	0.782
Birth	LBW (49)	34(69.4%)	29(59.2%)	23
Weight	Normal (301)	151(50.2%)	105(34.9%)	107(35.5%)
P value		0.012*	0.001*	0.126
Exclusive	No(8)	4(50%)	2(25.0%)	3(37.5%)
breast	Yes (342)	181(52.9%)	132(38.6%)	127(37.1%)
feeding for				
6 months				
P value		1.00	0.715	1.00
Initiation of	Delayed (99)	61(61.6%)	46(46.5%)	87(34.7%)
complementary	Not	124(49.4%)	88(35.1%)	43(43.4%)
feeding	delayed(251)			
P value		0.039*	0.048*	0.121

The above table shows that, out of 350 children majority 209 (59.71%) were girls and 141 (40.29%) were boys. Most of the children were belonging to the age group of 2 to 3 years (26.3%). Majority of the children belonged to lower middle class (class IV) of B G Prasad's classification for socioeconomic status. Rest of the children belonged to middle and lower class.

There was statistically significant association between birth order, mother's occupation, low birth weight, delayed complementary feeding to underweight. Mother's education had significant association with malnutrition. Factors like Socioeconomic status, low birth weight, delayed complementary feeding had significant association with stunting.

DISCUSSION

The study revealed prevalence of underweight, stunting and wasting as 52.9%, 38.3% and 37.1% respectively which is significantly higher when compared to state and national surveys¹¹. Overall prevalence of undernutrition was 62.85%. It was found that prevalence of underweight is high followed by stunting and wasting, that signifies both acute and chronic malnutrition are more prevalent.

This is similar to study findings by Sethy *et al.*¹², Kumari *et al.*¹³, Shreyaswi *et al.*¹⁴.

Sociodemographic factors like age, gender, religion, family size, no. of children in the family, type of family were found to have no statistical significant association with malnutrition. But the association between birth order to underweight and socioeconomic status to stunting were found statistically significant. Father's education had significant association with underweight. Sharma *et al.*¹⁵ observed statistically significant association for father's educational status with underweight and stunting with age of baby, birth weight, & family monthly income variables. Pragati Chaudhary *et al.*¹⁶ found significant association between age, number of children, birth order to underweight.

In present study father's education had significant association with underweight and mother's education had significant association with wasting, stunting and underweight. This was similar to the study findings by Gupta R *et al.*¹⁷, Malay Savalia *et al.*¹⁸, Darsene *et al.*¹⁹, Yalaw *et al.*²⁰, Kaushal *et al.*²¹, Mittal *et al.*²², Pragati Chaudhary *et al.*²³.

The study unveiled the importance and awareness about promotion of girl education in reducing the burden of malnutrition and it was also found from this study that children whose mothers are employed are more prone for being underweight. All children in the present study were born in hospital. Most of the babies (99.7%) were not given any kind of prelacteal feeds and 97.7% of children were exclusively breast fed upto 6 months. Age of the mother at the time of pregnancy and gestation of the baby had no significant association with malnutrition but there was significant statistical association of low birth weight with stunting and underweight. This was similar to the study findings by Sharma A *et al.*¹⁵, Purohit L *et al.*²⁴, Malay Savalia *et al.*¹⁸, M. Shafiqur Rahman *et al.*²⁵, Sharma A *et al.*¹⁵.

Timely introduction of complementary feeds were done for only 71.7% of children. Its association with stunting and underweight were found statistically significant.

In study by Islam *et al.*²⁶, feeding of colostrum, exclusive breast feeding, prelacteal feeding and time of initiation of complementary feeding were found to be significantly associated with the prevalence of underweight among the under 5 children.

CONCLUSION

Child under five constitutes the most vulnerable segment of any community and their nutritional status is a sensitive indicator of community health. This study had thrown light to the factors to be focussed more to reduce the burden of malnutrition in under five children of tea tribe population. The high prevalence of malnutrition in the early years of life justifies focusing the children of tea tribe population at an early age for effective improvement in their nutritional status. The present study findings reinforce the importance of proper infant and child feeding practices, timely introduction of complementary feeds, appropriate maternal care, and female literacy in prevention of childhood undernutrition. Concrete steps need to be taken to uplift the socioeconomic living conditions of tea tribe population.

Limitations

The study couldn't assess all determinants of malnutrition and sample size is inadequate to determine the subgroup associations. To have a better knowledge of the determinants of malnutrition among tea tribe children, a longitudinal study and qualitative research with in depth analysis is important.

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