

# Assessment Of Nutritional Status and Associated Factors Among Tharu Students of Primary School In Kanchanpur District, Nepal

Ganesh Bhandari<sup>1</sup>, Mahesh Bahadur Mahara<sup>2</sup>, Ashnita Rawat<sup>3</sup>

<sup>1</sup>Scholar of MPH, Pokhara University, Nepal

<sup>2</sup>Assistant Professor, Amity College, Pokhara University, Nepal

<sup>3</sup>Scholar of MPH, University of North Texas Health Science Centre, USA

## Abstract

### Introduction

The state of one's nutrition is a key indicator of one's overall health. School age is the most active period of a child's development. One of the key causes of higher child mortality rates in developing nations is malnutrition during childhood. Chronic malnutrition in children has been linked to delayed cognitive development and major health problems later in life, lowering people's quality of life. The Tharu community is believed to be socially and economically disadvantaged. As a result, the purpose of this study was to evaluate the nutritional status and characteristics related to it among primary school aged children from the Tharu population in Kanchanpur.

### Methods

A cross-sectional analytical study was conducted among 365 students of the Tharu community studying at the primary level in government school in Kanchanpur district. Structured questionnaire and anthropometric measurement were used to measure height and weight of the children and generate required information. Convenience sampling was done for the selection of the schools, and random sampling was done for data collection among students. Data entry was performed in EPI-data, and ENA and SPSS (version 16.0) were used to convert height and weight measures into z-scores, factors associated with nutritional status, respectively. A chi-square test was applied for associations between the variables as per the research objectives.

### Results

Moderate and severe stunting were found in 25.2 percent and 20.3 percent of the population, respectively, while severe underweight was found in 6.9 percent of the population, but moderate underweight was found in 36.8 percent. In terms of BMI for age, 29.6 percent of people were underweight. There was an association between the mother's educational status and stunting, as well as family type and children's BMI.

### Conclusion

Malnutrition is a severe concern in the Tharu community, according to this study. Tharu community elementary school pupils' dietary standards were found to be deficient. Because no previous research has

been done in Nepal on this issue in the Tharu community, this study will serve as a starting point for future research in similar conditions. This will also assist concerned authorities in reducing undernutrition.

**Keywords:** Stunting, Wasting, Tharu Community,

## INTRODUCTION

Nutrition is the most important aspect of health in every age group. In children, it plays a vital role in the formative years of their growth and development. Malnutrition continues to be the leading public health problem in developing countries. In 2020, an estimated 149 million children under the age of five were stunted, and 45 million were wasted, 85.4 million were underweight, and 38.9 million were overweight or obese. (1) Out of that, in Southern Asia alone, 25 million children under the age five were wasted, 54.3 million were stunted, and 45.6 million were underweight. (2) In the globe around 45% of the deaths among under 5 children are linked to undernutrition. (1) According to the Nepal demographic health survey report of 2016, out of 2491 children under age five, 36% were stunted, 10% of them were wasted, and 27% of them were underweight. (3) The problem is even worse in rural areas and among children of underprivileged groups in the country. There are various factors that have been linked to malnutrition in children, including family type, educational and economic status of mother and father.

In this study, an attempt has been made to assess the nutritional status among Tharu children in Kanchanpur district which is in the far west province of Nepal. The Tharu ethnic group make up the second largest indigenous group in the district, making up 21 %. (4) However, they remain among the underprivileged group, not only in the district but also in the entire country. The purpose of the study is to shed light on the nutritional status and associated factors of the Tharu community, for which primary school children were selected, so that the findings of the study can be used by policymakers at the local and central levels in their endeavor to formulate health care policy.

## METHODOLOGY

The study was a cross-sectional analytical survey that was conducted during the study period of 2017-2018 in the Kanchanpur district, which lies in the southwestern part of Nepal. The study includes seven governmental schools selected by convenience sampling method, and approval letter, for the study were taken from both the education section of the respective municipality and school administration. A required sample size of 365 was calculated using the population proportion formula. Students from the Tharu ethnic group studying in grades I to V were selected with the help of a random sampling technique. For the assessment of nutritional status and associated factors, a questionnaire consisting of sociodemographic variables of the study subject along with the family type, education, and occupational status of parents was used after a pretest of the questionnaire. Written consent from parents and assent consent from the study subject were taken. The questionnaire and the consent were written and explained in the local language, making sure that the parents with a low level of literacy would also understand.

The height and weight of the subject were assessed with the help of a measuring tape and a weighing scale that was calibrated to a known weight. For weighing, clothes were not removed because of the lack of privacy in the classroom. Height was taken after taking off their shoes and standing with their heels together, keeping their heads perpendicular to their bodies, and recorded to the nearest 0.1 cm.

Nutritional assessment was done with the help of anthropometric measurements. Nutritional status was defined according to Waterlows classification as moderate to severe stunting and underweight. (4) And

analysis of stunting and underweight is done as per the National Center for Health Statistics (NCHS).(5) Body Mass Index (BMI) was calculated using the formula,  $BMI = \text{Weight in kg} / (\text{Height in meter})^2$

Two visits were made to include the absentee, and confidentiality was maintained throughout the study.

EPI Data was used to enter the data, while SPSS and ENA were utilized to analyze the data. Variables were represented in terms of frequency and percentage. The Chi-square test was used to test the significance of association between the socioeconomic characteristics of the parent and the child’s nutritional status.

**FINDINGS**

**Socio-demographic characteristics**

Table 1: Socio-Demographic characteristics

Variables		Frequency (n)	Percentage (%)
Age groups(months)	60-120	201	55.1
	120-180	161	44.1
	>180	3	0.8
Gender	Male	162	44.4
	Female	203	55.6
Educational level of participants mother	Literate	64	17.5
	Illiterate	301	82.5
Educational level of participants father	Literate	17	4.7
	Illiterate	348	95.3
Family type	Nuclear	214	58.8
	Joint	123	33.2
	Extended	28	8.0
Occupation of participants parents	Farmer	199	54.5
	Labor	93	25.5
	Government service	28	7.7
	Foreign employment	45	12.3

Out of 365 students, more than half of the children-201 (55.1%) were between the ages of 60 and 120 months, while 161 (44.1%) were between the ages of 120 and 180 months. Only 0.8 percent of the children were older than 180 months. The data on the family structure in the study region revealed that 214 (58.8%) of the respondents belonged to a nuclear family, 123 (33.2%) to a joint family, and 27 (7.4%) to an extended family. The findings also revealed that there were more girls in the schools than boys. 162 (44.4%) of the 365 respondents were male, while 203 (55.6%) were girls.

According to the findings, 301 (82.5%) mothers and 348 (95.3%) fathers were literate. All the parents of children are employed, with a maximum of 199 (54.5%) being farmers. The rest were involved in government service, foreign employment, and other labor-based activities.

**Prevalence of Stunting and Underweight**

Table 2: Prevalence of stunting and Underweight

Characteristics		Frequency (n)	%age (%)
Stunting	Moderate	92	25.2
	Severe	74	20.3
Underweight	Moderate	132	36.2
	Severe	25	6.9

Stunting was found to be prevalent in 45.5 percent of the population. Children who were moderately stunted accounted for 25.2 percent of the total, while 20.6 percent were severely stunted. In total, 43.1 percent of young children were underweight. 36.2 percent of them were moderately underweight, while 6.9 percent of them were severely underweight.

**BMI for Age**

Table 3: BMI for age

BMI for age	Frequency (n)	Percentage (%)
Underweight	108	29.6
Normal	222	60.8
Overweight	28	7.7
Obese	7	1.9

According to BMI for age, 108 (29.6%) children were underweight. More than half, 222 (60.8 %), of the children had a normal BMI for their age, while 28 (7.7%) of the students were found to be overweight, and 7 (1.9%) of them were obese.

**Association between socio-demographic variables and nutritional status**

Table 4: Association between socio-demographic variables and nutritional status

Characteristics		Normal (%)	MU (%)	SU (%)	Chi-square	p-value	Normal (%)	MS (%)	SS (%)	Chi-square	p-value
Age (months)	60-120	30.3	20.9	3.9	40.61	0.00	36.3	13.6	5.2	30.29	0.00
	120-180	25.8	15.3	3.0			17.4	11.6	15.1		
	Above 180	0.8	0	0			0.8	0	0		
Gender	Male	24.2	17.1	3.1	0.62	0.73	22.9	12.1	9.4	0.77	0.68
	Female	32.7	19.1	3.8			31.6	13.1	10.9		
Educational status of mother	Literate	10.5	5.6	1.4	0.18	1.91	8.3	5.2	4.0	7.38	0.025
	Illiterate	46.4	30.6	5.5			46.2	20.3	16.3		

Educational status of father	Literate	2.2	1.9	0.6	0.95	0.62	14.9	2.3	0.3	3.26	0.19
	Illiterate	54.0	34.3	6.3			39.6	22.9	20		
Family Type	Nuclear	35.8	20.4	2.6	1.37	0.84	38.6	10.9	9.3	0.17	0.99
	Joint	20.8	10.3	2.1			13.6	10.6	9.0		
	Extended	0.3	5.5	2.2			2.3	3.7	2.0		

Moderately underweight (MU) and severely underweight (SU) children accounted for 20.9 and 3.9 percent of children aged 60 to 120 months, respectively, whereas moderately and severely underweight children accounted for just 15.3 and 3 percent of children aged 120 to 180 months, respectively. In the 60-to-120-month age range, the number of moderately stunted (MS) and severely stunted (SS) children was 13.6 percent and 5.2 percent, respectively, whereas in the 120-to-180-month age group, the number of moderately stunted and severely stunted children was 11.6 percent and 15.1 percent, respectively. The ages of the children with stunting and those who were underweight were found to have a significant association.

22.9 and 20.2 percent of the females and males were found to be underweight, respectively. There was no evidence for an association between a child's sex and weight. Stunting was also shown to be more common in girls (24% of them) than in boys (21.5%). There was no evidence for an association between children's sexes and stunting.

In children of literate mothers, the prevalence of moderate and severe underweight was 5.6 and 1.4 percent, respectively, but it was 30.6 and 5.5 percent, respectively, in children of illiterate mothers. The prevalence of moderate and severe stunting among children of literate mothers was found to be 5.2 and 4.0 percent, respectively. Moderate and severe stunting were seen in 20 and 16.3 percent of children with illiterate mothers, respectively. There was no association identified between a mother's educational status and her child's weight. However, there was an association between mothers' educational status and their children's stunting.

Children of literate fathers had a prevalence of moderate and severe underweight of 1.9 and 0.6 percent, respectively, but children of illiterate fathers had a prevalence of 34.3 and 6.3 percent, respectively. The percentages of moderate and severe stunting among the children of literate fathers were found to be 2.3 and 0.3, respectively. Moderate and severe stunting were seen in 22.9 and 20.0 percent of children with illiterate fathers, respectively. There was no significant association identified between a father's literacy and his child's nutritional status.

The prevalence of moderate and severe underweight in children from nuclear families was 20.4 and 2.6 percent, respectively, whereas it was 10.3 and 2.1 percent in children from joint families. The prevalence of moderate and severe underweight in children from extended families was 5.5 and 2.2 percent, respectively. Children from nuclear families had a prevalence of moderate and severe stunting of 10.9 and 9.3 percent, respectively, whereas children from joint families had a prevalence of 10.6 and 9.0 percent, and children from extended families had a prevalence of 3.7 and 2.0 percent, respectively. There was no evidence of a link between family types and underweight and stunting.

**Association between socio-demographic variables and BMI of children**

Table 5 Association between socio-demographic variables and BMI of children

Characteristics		Underweight (%)	Normal weight (%)	Overweight (%)	Obese (%)	Chi-square	p-value
Age (months)	60-120	16.4	35.65	2.25	0.8	10.76	0.09
	120-180	12.4	25.15	5.45	1.1		
	Above 180	0.8	0	0	0		
Sex	Male	13.6	27.6	2.9	0.3	1.26	0.79
	Female	16.0	33.2	4.8	1.6		
Family Type	Nuclear	17.0	36.7	3.5	1.6	23.241	<b>0.001</b>
	Joint	10.6	20.1	2.2	0.3		
	Extended	2.0	4.0	2.0	0		
Educational status of mother	Literate	5.3	9.55	1.9	0.75	3.87	0.27
	Illiterate	24.3	51.25	5.8	1.15		
Educational level of father	Literate	1.2	1.75	1.51	0.2	1.64	0.78
	Illiterate	28.4	59.05	6.15	1.7		

According to BMI for age, 29.6% of the students were found to be underweight, 7.7% of them were overweight, and 1.9% of them were found to be obese. In relation to sex category, 13.6% of the male and 16.0% of the female were underweight.

It has been seen from the table that 17.0 percent of children in nuclear families are underweight, 36.7 percent are normal weight, 3.5 percent are overweight, and 1.6 percent are obese. 10.6 percent of children in a joint household are underweight, 20.1 percent are normal weight, 2.2 percent are overweight, and 0.3 percent are obese. 2.0 percent of extended family members' children are underweight. The type of family and the BMI of the children show a significant association with a p value of 0.001.

In relation to the BMI for age, findings on the table show no association with the educational status of either the mother or father.

**DISCUSSION**

Studies involving the nutritional status and associated factors among children of the Tharu community in Nepal were not found. Nonetheless, evidence from various other region of the country and from other countries with relative similarity was used for the discussion.

This study found primary level children aged 5 to 16 years of age with the stunting and underweight percent of 45.5 and 43.1 respectively which is found to be higher than the global report of 2020 given by UNICEF. According to the UNICEF 21.3%, 6.3%, and 5.6% of the children under five years of age had stunting, underweight, and overweight, respectively. (6) Nepal Demographic Health Survey (NDHS) reported stunting in 36% and underweight in 27% of children under five years of age, which shows this

study has a higher number of children affected by malnutrition in comparison with the national survey.(3) Though the finding in the study is not comparable to the national level study, the higher degree of malnutrition in the children of underprivileged groups demands national level effort to explore its determinants.

A study conducted in the countries hilly region revealed that 40.4% of under five children to be stunted and 27.4% to be underweight. (7) Another study done by Shakya et al. found 21.5% and 10.4% of under five children are stunted and underweight, respectively.(8) Both of the above findings are less than that of the current study; however, both of them, including the study from the national survey, showed a prevalence of stunted children higher than that of underweight children. (3) In contrast to the finding above, a study done in Kavre district revealed a higher prevalence of underweight (30.85%) than stunting (24.54%). (8)

In relation to age, a total of 43.6% of children aged 5-10 years and 45% of children aged 10-16 years were found to be malnourished in this study. Increased frequency of malnutrition with increasing age may be related to the food choices that children of this age group make and also to less attention given by parents to the food intake of this age group because of their independent ability to eat. However, a consensus has not been reached regarding the relationship between age and nutritional status of the children. (9,10)

There is a lot of variation in the prevalence of malnutrition among girls and boys. Higher prevalence of malnutrition is seen among females in South East Asia and Africa. (11) In this study, 24% and 22.9% of the females were stunted and underweight, respectively, which is higher than that of the males. Similarly, a study done in Bangladesh also showed a higher percentage of girls (54%) with malnutrition. (12) The reason for this finding is probably due to differences in the distribution of foods among family members. With boys given higher preference in many communities in this part of the world, can also be one of the reasons behind it. Nonetheless, there are contradictory findings as well. A study conducted in India showed a higher percentage of males being stunted (26.31%) and underweight (44.56%). (13) A study conducted among children of 5 to 15 years of age in Pakistan also reported the presence of a higher percentage of malnutrition among boys than girls. (14)

This study found a significant relationship between maternal literacy and stunting. Stunting was found to be lower in families with literate mothers in comparison with families with illiterate mothers. Similar findings have been seen in a study done in Lalitpur district by Sarki et al. (15) There are various other studies demonstrating the impact of the lower level of education of mothers on the nutritional status of children. (15,16)

The BMI for age among the children in this study demonstrated a wide range of data. 29.6% of the children were underweight, 60.8% had a normal BMI for their age, 7.7% of them were overweight, and 1.9% of them were obese. In study done in Humla, among children ages 5 to 15, a similar finding was seen with 22.4% of the children being underweight. (7) In addition, study done in Mugu and Kavre districts also demonstrated findings comparable to those of this study. (9,17)

### **LIMITATION OF THE STUDY**

First of all, the study subjects were students from the Tharu community, and not much study has been done on this group in the country. Since most of the studies done at the national level and among other countries are usually focused on children under five years of age, it was difficult to have a discussion on various aspects of this study. Furthermore, discussion has been limited to few a studies that included children above 5 years of age. The study has pointed out the findings among a small group of children in

one district, which is not representative of the whole country; hence, the findings cannot be generalized among the Tharu community or other communities in the entire nation.

## CONCLUSION

This study demonstrated that malnutrition is a serious issue among the children in the Tharu community. The prevalence of malnutrition among the Tharu community was found to be greater in comparison with that of the nation. Mothers' education and the type of families have played an important role in lowering the risk of stunting and underweight among children, respectively. This study bears the restriction of being representative of only Tharu people from Kanchanpur district, and therefore cannot be extrapolated for other communities. Since not much study has been done among this underprivileged group in the country, this study can serve as a starting point for future studies. Also, the authors expect concerned authorities to use with the findings of this study to plan further for the betterment of all the people in the community.

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