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Nutritional Status and Dietary Pattern of Chepang Children in Nepal

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ABSTRACT

The Chepang are an indigenous Tibeto-Burman ethnic group mainly inhabiting the rugged ridges of the Mahabharat mountain range of central Nepal. They used to live a semi-nomadic lifestyle until a couple of generations ago. With such conditions, their nutrition status among children and their lifestyle seem to be in poor conditions. This study is carried out to assess the nutritional status and dietary pattern of primary school age children of chepang community living in Kalika municipality, Chitwan, Nepal. The children were interviewed together with their parents/ teachers after which their anthropometric measurements were taken. Information regarding socio –demographic information, physical activities and diet intake were recorded. Food frequency questionnaire was utilized to know the frequency of food per week. Face-to-face interview technique with a structured questionnaire was used to collect data from the respondents.

Out of the 145 children, majority of the children were found to be underweight (72.3%) and stunted (86.9%) whereas comparatively lower amount of children were found to be wasted (6.2%). Nearly half of the children (43.5%) under 5 years of age were found to be at a risk for acute malnutrition.

Key words: *Malnutrition, Stunting, Underweight, Chepang, Ethinic group*

INTRODUCTION

The Chepang are an indigenous Tibeto-Burman ethnic group mainly inhabiting the rugged ridges of the Mahabharat mountain range of central Nepal. Over the past two or three generations, the Chepang have begun to slowly shift from a semi-nomadic (slash-and-burn) lifestyle to a more settled way of life, relying increasingly upon the production of permanent fields of maize, millet and bananas. With increasing populations, lack of arable land and few irrigation options, malnutrition has been a historic problem for the Chepang despite forest supplements.

WHO estimates that malnutrition accounts for 54% of child mortality worldwide, about 1 million children. Hence, malnutrition exists globally and may result in both short and long-term irreversible negative health outcomes. According to FAO, the consequences of malnutrition are a significant concern for the Government of Nepal, since around 1 million children under 5 years (36%) suffer from chronic malnutrition (stunting or low height for age) and 10 percent suffer from acute malnutrition (wasting or low weight for height). (MOH; et. Al,. 2017)

Prevalence of underweight, stunting and wasting was 22.7%, 37.3% and 25.7%

respectively in Chitwan according to a research done by D. Ruwali. The Chepang have often been characterized as the poorest of Nepal's poor. According to the 2011 Census, their population stands at 68,399 Chepang in the country, of which 67.63% were Hindu, 23.38% were Buddhists, 7.74% were Christians, and 1.25% others. They are mostly located in Dhading District, Chitwan District, Gorkha District, Makwanpur District, and Tanahu District with 3.7% people speaking Chepang as their first language in Chitwan district only.

Chepang community is an indigenous group of people who used to live a semi-nomadic lifestyle until a couple of generations ago. With such conditions, their nutrition status among children and their lifestyle seem to be in poor conditions. With this research, the aim is to find out the prevalence of children suffering from malnutrition so that further research can be done on this to help their situation. Recording of their lifestyle and dietary pattern can help to better understand them which ultimately makes it easier to provide help and support for them.

Assessment of the nutritional status, living style and dietary habits among the school going children of the Chepang community is going to be conducted. This age group is a sensitive age group. For the rapid growth during adolescence ahead, conserves are being laid down during this period.

Objective of the study

General Objectives: The general objective was to study the nutritional status and dietary pattern of the Chepang School going children of Kalika Municilaity in Chitwan District of Nepal.

Specific Objectives

i. To study the anthropometric measurements of the Chepang school going children.
ii. To study the prevalence of stunting, wasting and underweight.
iii. To study the dietary and lifestyle patterns of the school going children.
iv. To study the level of physical activity of the Chepang children.

RESEARCH METHOD

This is a cross sectional descriptive study carried out to assess the nutritional status and dietary pattern of primary school age children from Kalika Municipality of Chitwan district where 3.7 % people have Chepang language as their first language. The children were interviewed together with their parents/ teachers after which their anthropometric measurements were taken. The children were interviewed together with their parents/ teachers after which their anthropometric measurement was taken.

An interview method followed by anthropometric measurement for the height in cm and weight in kg was used including waist hip ratio for the data collection. Then the children were asked about socio – demographic information, physical activities and diet intake. Food frequency questionnaire was to know the frequency of food per week. A structured questionnaire was used as tool of data collection. Face-to-face interview with

children and their parents were used to collect data from the respondents.

The height was measured by using stadio-meter and weighing machine was used for the weight measurement. Weighing machine was standardized for the accuracy of weight before the weight measurement. The waist hip ratio was taken by using inch tape [kud]

Data collection tool and basic interviewing techniques were strictly followed in addition to check the consistency and completeness of the tool. Data processing was done by creating variables, entering, coding and tabulation of the data and analysis was done using SPSS version 20 software and Ms Excel. Descriptive and inferential statistics (mean, mode, standard deviation etc.) was used for data analysis. Chi -square test was used to analyze the association between dependent variable and independent variables of the study. All probability values less than 0.05 ($p<0.05$) was considered statistically significant.

Table 1: Socio-demographic variables

Variable	Number	Percentage
Age		
<5 years	23	15.9
5-9 years	68	46.9
>10 years	54	37.2
Sex of respondent		
Male	70	48.3
Female	75	51.7
Religion of respondent		
Christian	145	100.0
Type of your family		
Nuclear	72	49.7
Joint	73	50.3
Educational Status of respondent		
Not started class	32	22.1
Class1-5	94	64.8
Class 6-10	19	13.1
Source of family income		
Agriculture	47	32.4
Agriculture & labor	84	57.9
Driving, shop, business & other	14	9.7
Annual income of family		
Nrs. <30,000	87	60.0
Nrs. >30,000	58	40.0

RESULTS

The table 1 shows that 15.9% children were from ages under 5 years, followed by (46.9%) 6 - 9 years and (37.2%) 10 -12 years. More than half of the children (51.7%) studied were female whereas the rest of the children (48.3%) were male. All of the respondents followed Christianity as their religion. Half of the children (50.3%) belonged to joint family and the rest (49.7%) belonged to nuclear family.

Majority of the children (64.8%) were enrolled in class 1-5 followed by (13.1%) enrolled in class 6-10 and nearly quarter (The above table shows that 15.9% children were from ages under 5 years, followed by (46.9%) 6 - 9 years and (37.2%) 10 -12 years.

More than half of the children (51.7%) studied were female whereas the rest of the children (48.3%) were male. All of the respondents followed Christianity as their religion. Half of the children (50.3%) belonged to joint family and the rest (49.7%) belonged to nuclear family.

Majority of the children (64.8%) were enrolled in class 1-5 followed by (13.1%) enrolled in class 6-10 and nearly quarter (22.1%) children had not started their study yet. More than half of the children's families (57.9%) had income from agriculture and farming, whereas 32.4% had agriculture as their income source and the rest 9.7% had driving, business, shops, etc. as their income sources. More than half of children (60.0%) had annual family income below Nrs.30,000

and the rest (40%) had annual family income above NRs.30,000.

Table 2: Nutritional Status of the Chepang children

Variable	Number	Percent
MUAC of the respondents		
Risk for acute malnutrition(12.5-13.5)	10	43.5
Well Nourished(>13.5)	13	56.5
BMI of the respondents		
Underweight (<18.5)	121	83.4
Normal (18.5-24.99)	24	16.6
WH Ratio for male		
Low risk (<0.95)	54	77.1
Medium risk (0.96-1)	16	22.9
WH Ratio of female		
Medium risk (0.81-0.85)	29	38.7
High risk (>0.85)	46	61.3
Height for age (Waterlow's classification)		
Normal (>95)	19	13.1
Mildly Impaired (87.5-95)	92	63.4
Moderately impaired (80-87.5)	30	20.7
Severely impaired (<80)	4	2.8
Weight for height (Gomez Classification (WHO standard)		
Normal (>90)	136	93.8
Mildly impaired (80-90)	9	6.2
Weight for age (Gomez Classification (WHO standard)		
Normal nutritional status (90-110)	40	27.6
First degree, mild malnutrition (75-89.99)	63	43.4
Second degree, moderate malnutrition (60-74.99)	37	25.5
Third degree, severe malnutrition (<60)	5	3.4

Above table illustrates that among the children under 5 years of age, a little more than half of the children (56.5%) were well nourished (MUAC>13.5) while nearly half of the children (43.5%) were at a risk for acute malnutrition (MUAC between 12.5-13.5).

Majority of the children (83.4%) were underweight (BMI below 18.5) and the rest (16.6%) were normal (BMI between 18.5-24.99).

Three quarters of the total male respondents (71.4%) had waist-hip ratio of below 0.95 (low risk for obesity) and the remaining children (22.9%) had waist/hip ratio between 0.96 to 1 (medium risk for obesity).

For the total female respondents, more than half children (61.3%) had waist-hip ratio above 0.85 (high risk for obesity) and the rest (38.7%) had waist-hip ratio between 0.81-0.85(low risk for obesity).

More than half of the children (63.4%) had mildly impaired height for age while nearly a quarter of them (20.7%) were moderately impaired, followed by 13.1% with normal height for age and 2.8% severely impaired. Thus, 86.9% of the total children were found to be stunted.

Nearly all the children (93.8%) had normal weight for height (>90) and the rest (6.2%) were mildly impaired (80-90). Therefore, 6.2% of the children were found to be wasted.

Almost half of the total children (43.4%) were in the first degree, mildly malnourished(75-89.99), a little over a quarter (27.6%) had normal nutritional status(90-110), a quarter of the children(25.5%) were in the second degree, moderately malnourished(60-74.99) and the rest (3.4%) were in the third degree, severely malnourished(<60). Thus, it was found that 72.3% of the total children were underweight.

Table 3: Immunization Status of the Chepang children

Variable	Number	Percentage
Immunized	145	100.0

The table 3, shows that all the children have been immunized.

Table 4: Frequency of visiting hospital/health centers

Variable	Number	Percentage
Once in 6 months	29	20.0
Once a year	6	4.1

When its emergency	110	75.9

The table illustrates that three quarters (75.9%) of the total children visited hospital/health centers only when it was emergency, nearly a quarter of them (20%) visited them once in 6 months and the rest (4.1%)visited them once a year only.

Table 5: Frequency and Source of water consumption

Variable	Number	Percentage
Source of drinking water		
Tap water	145	100.0
No. of glasses of water		
1-3	30	20.7
4-6	13	9.0
Whenever thirsty	82	56.6
Don't know	20	13.8

The above table shows that the common source of drinking water for all the children was tap water. More than half of the children (56.6%) drank water whenever they were thirsty, nearly a quarter (20.7%) drank it 1-3 times per day while 9% drank water 4-6 times per day and 13.8% children did not know.

Dietary Pattern:

The frequency of Dietary pattern and Meal pattern among Chepang children are depicted in Table number 6-14. Table 6 clearly depicts that all of the children are vegetarian. Table 7 shows that more than half of the children (69.0%) have their meals three times a day while the rest (31.0%) have their meals only two times a day. Table 8 illustrates that all the children consumed cereals on a daily basis. Nearly all the children (91.0%) consumed pulses and legumes occasionally and the rest (9.0%) consumed them once a week.

Table 6: Frequency of vegetarians

Variable	Number	Percentage
Vegetarian		
Non-vegetarian	145	100.0
Vegetarian	0	0

Table 7: Frequency of meals in a day

Variable	Number	Percentage
Frequency of meal		
Two times	45	31.0
three times	100	69.0

Table 8: Frequency of cereals consumption

Variable	Number	Percentage
Everyday	145	100.0

Table 9: Frequency of pulses and legumes consumption

Variable	Number	Percentage
Frequency of pulses & legumes in a week		
Once a week	13	9.0
Occasional	132	91.0

Table 10: Frequency of vegetables consumption

Variable	Number	Percentage
Frequency of roots & tubers in a week		
Everyday	2	1.4
2-4 times a week	106	73.1
5-6 times a day	13	9.0
Once a week	24	16.6
Frequency of other vegetables in a week		
Everyday	22	15.2
2-4 times a week	59	40.7
5-6 times a week	35	24.1
Once a week	25	17.2
Occasional	4	2.8
Frequency of green leafy vegetables in a week		
Everyday	89	61.4
2-4 times a week	21	14.5
5-6 times a week	35	24.1

Nearly three quarters of the total children (73.1%) consumed roots and tubers 2-4 times a week, followed by 16.6% consuming once a week, while 9.0% consuming 5-6 times a week and only 1.4% consuming every day. Nearly half of the children (40.7%) consumed vegetables 2-4 times a week, followed by nearly quarter of them (24.1%) consuming them 5-6 times a week, while 17.2%

consuming them once a week, 15.2% consuming them every day and only 2.8% consuming them occasionally. More than half of the children (61.4%) consumed green leafy vegetables on a daily basis while nearly a quarter of the total children (24.1%) consumed them 5-6 times a week and the rest (14.5%) consumed them 2-4 times a week.

Table 11: Frequency of meat and egg consumption

Variable	Number	Percentage
Frequency of meat & meat products in a week		
2-4 times a week	31	21.4
5-6 times a week	8	5.5
Once a week	87	60.0
Occasional	19	13.1
Frequency of eggs consumption in a week		
2-4 times a week	6	4.1
Once a week	38	26.2
Occasional	101	69.7

More than half of the children (60.0%) consumed meat once a week, whereas nearly quarter of the children (21.4%) consumed them 2-4 times a week, followed by 13.1% consuming them once a week and the rest (5.5%) were consuming them 5-6 times a week. Nearly three quarters of the children (69.7%) consumed eggs occasionally, while around a quarter of them (26.2%) consumed eggs once a week and the rest (4.1%) consumed eggs 2-4 times a week only.

More than three quarters of the children (86.2%) consumed milk occasionally, whereas 6.9% consumed it 2-4 times a week, followed by 4.8% consuming it once a week and the rest (2.1%) were consuming it 5-6 times a week (Table 12).

Table 12: Frequency of milk consumption

Variable	Number	Percent
Frequency of milk & milk products in a week		
2-4 times a week	10	6.9
5-6 times a day	3	2.1
Once a week	7	4.8
Occasional	125	86.2

Table 13: Frequency of fruits consumption

Variable	Number	Percent
Frequency of eating fruits in a week		
Once a week	12	8.3
Occasional	133	91.7

Nearly four quarters of the children (91.7%) consumed fruits occasionally and the rest (8.3%) consumed them once a week.

Table 13: Frequency of miscellaneous food consumption

Variable	Number	Percentage
Frequency of eating nuts in a week		
Never	138	95.2
Occasional	7	4.8
Consumption of fats & oils		
Everyday	145	100.0
Consumption of spices & condiments		
Everyday	145	100.0

Table 13 depict the details of miscellaneous foods consumed by Chepang children and table 14 shows the consumption of packaged food by them and the common packaged foods were noodles, biscuits and chocolates.

Nearly all of the children never consumed nuts with only 4.8% consuming them occasionally. All of the children consumed fats and oils daily. All of the children also consumed spices and condiments on a daily basis.

Table 14: Frequency of consumption of packaged foods

Variable	Number	Percentage

Consumption of packaged foods		
Yes	145	100.0

DISCUSSION

The above study presents that 15.9% children were from ages under 5 years, followed by (46.9%) 6 - 9 years and (37.2%) 10 -12 years which is similar to the statistics of the Central Bureau of Statistics (CBS), 2001 according to which there were higher percentage of children of the age group 6-9 (28.3%) followed by 10-14 (26.2%) and finally least percentage of children under 5 years (24.2%). In the present study, more than half of the children (51.7%) studied were female whereas the rest of the children (48.3%) were male which is in contrast to the statistics of CBS, 2001. According to the present study, all of the respondents followed Christianity as their religion which is in contrast to the finding by Statistical Yearbook of Nepal, 2013 which indicates Hinduism as the major religion followed (81.3%) with Christianity in the fourth position only (1.4%). In light of the present context, half of the children (50.3%) belonged to joint family and the rest (49.7%) belonged to nuclear family, which is in contrast to the Annual Household Survey 2015/16, which states that 17.1% people belong to nuclear families while the rest belong to various degrees of joint families. Present study depicts that majority of the children (64.8%) were enrolled in class 1-5 followed by (13.1%) enrolled in class 6-10 and nearly quarter (22.1%) children had not started their study yet. It was found in the current study that children who were 5 years old hadn't started their school, yet in opposition to the findings by World Bank collection of development studies, it was reported that primary school starting age (years) in Nepal was 5 years. In pretext of current study, more than half of the children's families (57.9%) had income from agriculture and labor, whereas 32.4% had agriculture as their income source and the rest 9.7% had driving, business, shops, etc. as their income sources which is similar to the findings conducted by R Chettri and U K Silwal. Present study illustrates that more than half of children (60.0%) had annual family income below Nrs. 30,000 and the rest (40%) had annual family income above NRs. 30,000. This data is in opposition to the study conducted by R Chettri and U K Silwal who states that higher percentage of people (49%) earned more than Nrs. 30,000 a year whereas the rest (26%) earned less than Nrs. 30,000 annually.

In present context, it is illustrated that among the children under 5 years of age, a little more than half of the children (56.5%) were well nourished (MUAC>13.5) while nearly half of the children (43.5%) were at a risk for acute malnutrition (MUAC between 12.5-13.5). Majority of the children (83.4%) were underweight (BMI below 18.5) and the rest (16.6%) were normal (BMI between 18.5-24.99). Three quarters of the total male respondents (71.4%) had waist-hip ratio of below 0.95 (low risk) and the remaining children (22.9%) had waist/hip ratio between 0.96 to 1 (medium risk). For the total female respondents, more than half children (61.3%) had waist-hip ratio above 0.85 (high risk) and the rest (38.7%) had waist-hip ratio between 0.81-0.85(low risk). More than half of the children (63.4%) had mildly impaired height for age while nearly a quarter of them (20.7%) were moderately impaired, followed by 13.1% with normal height for age and 2.8% severely impaired. Thus, present finding shows that, more than half of the total children (86.9%) of the total children were found to be stunted which is nearly similar to the study conducted in

Nigeria which reported that more than half of the children studied were stunted (52.7%). Nearly all the children (93.8%) had normal weight for height (>90) and the rest (6.3%) were mildly impaired (80-90). Therefore, present study depicts that very less number of the children (6.2%) were found to be wasted. Almost half of the total children (43.4%) were in the first degree, mildly malnourished (75-89.99), a little over a quarter (27.6%) had normal nutritional status (90-110), a quarter of the children(25.5%) were in the second degree, moderately malnourished (60-74.99) and the rest (3.4%) were in the third degree, severely malnourished (<60).

The table shows that the common source of drinking water for all the children was tap water. More than half of the children (56.6%) drank water whenever they were thirsty, nearly a quarter (20.7%) drank it 1-3 times per day while 9% drank water 4-6 times per day and 13.8% children did not know. In a study conducted in Ethiopia, it had been found that stunting and wasting were the major problems among school age children. Child age, water source for drinking, and anemia resulted in stunting whereas, child age, maternal education and age, family poverty and alcohol drinking were risk factors for wasting. According to Modjadgi, the prevalence of stunting and underweight were high among schoolchildren while the mothers were overweight and obese, indicating a double burden of malnutrition. According to Mwaniki, consumption of food which is inadequate in required calories and form less than four varieties of food groups by children were important predictor of malnutrition. According to community based cross sectional study in eastern Nepal, the prevalence of underweight was 37%, which differs from current study undertaken. Another study undertaken in Hariyana states that prevalence of underweight was 41.3%, which is also different from present study. A study conducted in Chepang children of Dhading district depicts those children stunted prevalence was 66%, which is nearly similar to the present context i.e., 86.9%, however the underweight prevalence was 66%, which is in contrast to present study. Meanwhile, the prevalence of wasting is very similar i.e., 6.6%.

The present study illustrates that three quarters (75.9%) of the total children visited hospital/health centers only when it was emergency, nearly a quarter of them (20%) visited them once in 6 months and the rest (4.1%) visited them once a year only.

In the context of present study, it was found that more than half of the children (69.0%) have their meals three times a day while the rest (31.0%) have their meals only two times a day. This is similar to the finding done by Ghimire, on dietary diversity of Chepang children in Dhading district of Nepal, which had shown more than half of the mothers fed their children meal 1-3 times within 24 hours (Ghimire, J), 2000.

The above table shows that there was significant association between BMI of the children with age of the respondent (P=0.050) and annual income of the family (P=0.036) which indicates that for managing underweight, socio-demographic factors such as age and annual income of the family play a vital role. Similarly, there was found no significant association between BMI of the children with socio-demographic characteristics such as sex (P=0.280), type of family (P= 0.628), educational status (P= 0.450) and source of family income (P= 0.069). According to a study conducted in

Dhading district, there was no significant association by the gender and family types with dietary diversity, which is similar to the present study.

CONCLUSION

The study revealed that, among the children under 5 years of age, a little more than half of the children were well nourished while nearly half of the children were at a risk for acute malnutrition. Majority of the children were underweight and the rest were normal. Male children were found to have lower risk for obesity than female children. More than half of the total children were found to be stunted and underweight whereas very low numbers of the children were found to be wasted.

It was found that socio-demographic factors such as age and annual income of the families were responsible for determining BMI of the children. These factors were also responsible for defining the future risk for obesity among male children. However, in female children, age and educational status were found to be the contributing factors for determining BMI. There could not be found any significant relationship between dietary pattern and BMI of the children which could be due to the fact that the total calories consumed in 24 hours was also very low. Meanwhile, frequency of consumption of meal per day was contributing factor for determining risk of obesity in male children and frequency of meat consumption was contributing factor for defining risk of obesity in female children.

Further researches on education and knowledge of mothers can be done to determine children's malnutrition status.

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