

Research Article

Effect of Complementary Feeding Practices and Nutritional status of Children (6-23 months) in Tamang Community, Ambhanjyang VDC of Makwanpur

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ABSTRACT

Background and Objectives: The aim of the paper was designed to know the relationship between complementary feeding, nutritional knowledge and behavior of mothers (IYCF practices) and nutritional status of children less than two years of age at Ambhanjyang Village Development Committee (VDC) of Makwanpur district.

Material and Methods: The study was conducted in aforesaid VDC of Makwanpur districts with a total of 120 samples. The questionnaire used consisted of socio-demographic information, health profile, dietary behavior of the child such as amount of feeding, frequency of feeding, diversified food and attitude statements of mothers regarding nutritional knowledge. The nutritional status of the child was assessed on the basis of anthropometric measurements weight and height.

Results: In this survey, 21.2 percent of the children were found to be moderately underweight while 5.8 percent of the children were severely underweight, 19.2 percent were moderately stunted while 15 percent were found severely stunted. Likewise, 10.8 percent of the children found moderately wasted and only 1 child was found to be severely wasted. No significant association was observed between various socio-economic factors, complementary feeding practices and nutritional status of a child.

Conclusion: The prevalence of under nutrition, stunting and inadequate complementary feeding practices was observed in the study sample. Although no significant association was observed between various socio-demographic factors and nutritional status of a child, there is an immediate requirement of healthy knowledge and change in behavior of mothers of children about complementary feeding practices to prevent the deteriorating nutritional status of child.

Key Words: Nutrition, complementary feeding, Exclusive breast feeding, Undernutrition

INTRODUCTION

As of 2015, 159 million of the children under the age of five were chronically malnourished

underscoring a global health and makes economic development a challenge. For improving nutrition in 2012, 176 members of

the World Health Assembly endorsed the first-ever global nutrition targets, focusing on six areas: stunting, anemia, low birth weight, childhood overweight, breastfeeding, and wasting [1, 2].

Malnutrition is responsible, directly or indirectly, for over half of all childhood deaths. About 45% of child mortality is associated with malnutrition [1]. Undernutrition remains the number one risk factor in sub-Saharan Africa and the fourth in South Asia [3]. After six months of age when breast milk alone is no longer sufficient to meet all the nutritional requirements and complementary feeding needs to be started, Infants and young children are at increased risk of malnutrition. The period of transition from exclusive breastfeeding to family foods, referred to as complementary feeding, covers a child from 6-23 months of age, and is a very vulnerable period. According to NDHS 2011, only 70% of the infants are exclusively breast feed and only 66% of the children from 6-23 months received solid, semi-solid or soft foods [4]. It is the time when malnutrition starts in many infants, contributing to the high prevalence of malnutrition in children less than two years of age. For proper growth and development of the children and appropriate diet is a critical important [5].

The first two years of life are a critical window for ensuring optimal child growth and development. Complementary feeding should be timely, meaning that all infants should start receiving foods in addition to breast milk from 6 months onwards. It should be adequate, meaning that the complementary foods should be given in amounts, frequency, and consistency and using a variety of foods to cover the

nutritional needs of the growing child while maintaining breastfeeding [6].

Scientific evidence indicates that inappropriate complementary feeding practices can have profound consequences for the growth, development and survival of infants and children [7]. Nutritional deficiencies during this period can lead to impaired cognitive development, compromised educational achievement and low economic productivity which become difficult to reverse later in life [8]. The Infant and Young Child Feeding (IYCF) practices recommend that breastfed children age 6-23 months also be fed food from four or more other food groups and be fed a minimum number of times per day. In Nepal, only 25% of the children age 6-23 months who receive food from four or more food groups⁴. Improving infant and young child feeding (IYCF) practices in children 0-23 months of age is therefore critical to improved nutrition, health and development [8].

The NDHS measures children's nutritional status by comparing height and weight measurements against an international reference standard. According to the 2011 survey, 41% of children under five are stunted, or too short for their age. This indicates chronic malnutrition. Stunting is more common in rural areas (41.8%) than urban areas (26.7%). Stunting is least common among children of more educated mothers and those from wealthier families. Stunting ranges from 42.1% in the hill and Terai 37.4% and in the mountain by 52.9%. Wasting (too thin for height), which is a sign of acute malnutrition, is kind of stagnant for many years which is 10% in Nepal. Wasting ranges from 11.2% in Terai, 10.6% in the hill and 10.9% in the mountain region.

Underweight, or too thin for age, is more common - 29% of Nepalese children under age five are underweight. Wasting, stunting and underweight are also affected by different factors such as Gender, Areas of residence, wealth quintile, maternal education and ecological zones [4].

Good nutrition is a prerequisite for the national development of countries and for the well-being of individuals. Although problems related to poor nutrition affect the entire population, women and children are especially vulnerable because of their unique physiology and socioeconomic characteristics. As described by lancet series 2013, three causes of undernutrition such as: Immediate causes of undernutrition are inadequate dietary intake and disease. A child's dietary intake and exposure to disease are affected by underlying factors, including household food insecurity (lack of availability of, access to, and/or utilization of a diverse diet), inadequate care and feeding practices for children, unhealthy household and surrounding environments, and inaccessible and often inadequate health care. Basic causes of poor nutrition encompass the societal structures and processes that neglect human rights and perpetuate poverty, limiting or denying the access of vulnerable populations to essential resources. Social, economic, and political factors can have a long-term influence on maternal and childhood undernutrition. Moreover, chronic undernutrition can lead to poverty, creating a vicious cycle [1].

It is well recognized that children are a nutritionally vulnerable segment of population, who are also very susceptible to morbidity due to infections. Under-nutrition is associated with impaired immune function

and consequent increased susceptibility to infections; infections aggravate under nutrition; if this vicious cycle continues it may result in death of the child [1].

Many parts of the country and communities remain unexplored. One of the unexplored communities is the Tamang community of the Makawanpur district, which constitutes 47.3% of the total district population, who mostly live in mountainous or hilly regions. According to National census its population is 1,179,145. In size of population it is in Fifth position of caste and Third position in ethnic group of Nepal. There are 2,980 total households and total VDC's population is 14,274, male are 6,846 and female are 7,428. This Tamang community is one of the highly marginalized communities categorized by Nepal Federation of Indigenous Nationalities [9]. In this context, the present study focuses on determinants of complementary feeding and nutritional status of children age (6-23) months and an understanding of factors affecting nutritional status of these children.

MATERIAL AND METHODS

Study Design and Locale

This was a cross-sectional study carried out in Ambhanjyang VDC of Makwanpur district. Systematic sampling study design was selected. The samples were selected from the VDCs systematically as Ward no. 2, 5, and 8 respectively. Within the wards, convenience sampling was used to include the samples and was selected entirely on Tamang community only.

Sampling Size and Sampling Method

Sample size has been estimated using the following formula considering prevalence of wasted children to be 11 % in Nepal [4]. We

know wasting is generally result of a recent nutritional deficiency. The indicator of wasting may exhibit significant periodic shifts associated with changes in the accessibility of food or prevalence of diseases. Hence, wasting prevalence is taken into account as it indicates recent nutritional status of a child. [10]. Also, the prevalence of wasting shows a peak in second year of child's life as well [11].

$$n = \frac{Z^2 P(1-P)}{d^2}$$

where n = sample size,

Z = Z statistic for a level of confidence (1.64 for 90 % level of confidence)

P = expected prevalence or proportion (here 0.11)

And d = precision (in proportion of one; if 5%, $d = 0.05$) [12].

Considering this a sample size of 105 has been computed, further, 15 percent margin for non-response has been added to it. Therefore, 120 under two children were enrolled for the study.

Ethical Consideration

Official letter from College of Applied Food and Dairy Technology was taken before conducting the research. Similarly approval from the concerned authorities for the study was also taken. Prior information about the study was given to the respondent and data was collected voluntarily after their consent. Personal identity of the respondent was maintained confidential. No omission, manipulation and correction of the actually collected data were done for the research.

Inclusion Criteria of the Samples

- Mothers were selected from Tamang ethnic group
- Children age between 6 – 23 months
- Children whose parents/care takers approved consent for participation in the study

Exclusion Criteria of the Samples

- Children aged less than 6 months and more than 23 months
- Children with congenital diseases, history of metabolic diseases, chronic diseases, physical and mental impairment that could influence their growth.

Tools and Techniques

Since data collection involved interaction with mothers of preschool children who had considerable low level of literacy, interview method was used for data collection. The information was elicited using a semi-structured questionnaire during house to house visits as well as in FCHVs monthly meeting. Information of the following aspects was gathered.

Dependent Variables:

The dependent variables for this study are the anthropometric indices namely: height for age, which indicates the level of stunting; weight for age, this indicates the level of underweight; and weight for height which indicates the level of wasting.

Independent Variables:

Independent variables were identified using UNICEF's conceptual framework of

malnutrition which states that causes of under nutrition can be classified as immediate (poor diet, disease); underlying (household food insecurity, inadequate care, unhygienic living condition and inadequate health service); and basic (socio-economic factors such as poverty, type of family, education level of family etc.)

The anthropometric measurements include assessment of:

- Weight of the subject
- Height of the subject

The nutritional status indicator of child was classified as per their Z score when compared with the WHO Growth Standards as shown in table 1. [13]

questionnaire. Wherever applicable, observations were also made to obtain information or to cross-check the information provided by the mother. The data collection was done from December 2015-January 2016 and the collected raw data were cleaned, coded and entered as soon as data was generated. The analysis of the data was done by applying Statistical Package for Social Scientist (SPSS) version 16. As per need of the study, recoding and transformation of data was performed. A p value of ≤ 0.05 was considered to be statistically significant. Cross tabulation was done for descriptive analysis of each of variable.

RESULTS

Characteristics of the study population

Z Score Classification	Weight-for-age	Height-for-age	Weight for height
< - 2SD	Severely/ moderately underweight	Severely/ moderately stunted	Severely/ moderately wasted
-2 SD to 1 SD	Normal	Normal	Normal
> 1 SD	Overweight/ obese	Tall	Overweight/ Obese

Data Collection and Analysis

Data collection was performed by professional data collector. Before administering the questionnaire, it was pretested and suitably modified. List of children enrolled in each health care centre of Ambhanjyang VDC was taken and after considering the inclusion/exclusion criteria they were short listed for the study. A door to door visit was then made to the child's house and in PHC/ORC service as well as in HMGs monthly meeting. Subsequently, 2-3 home visits were made to obtain the desired information using the structured

One hundred and twenty children were present in the study among them 54 (45%) were boys and 66 (55%) were girls. The result is shown in Table 2.

Table 2: Distribution of Child according to Sex

Sex of a child	Number (%)
Boys	54 (45)
Girls	66 (55)
Total	120 (100)

Early Initiation of Breastfeeding Practice

Figure 1 depicts poor knowledge and practice of mothers regarding early initiation of breastfeeding. Majority of mothers, 92

(76.6%) reported of initiation of breast feeding within 4 hour after child is born whereas only 21 (17.5%) mothers reported of initiation of breast feeding within 1 hour after child born.

feeding. Table 3 shows mothers knowledge regarding complementary foods. All mothers reported that they had knowledge about complementary feeding practices. Majority of the mothers 58.3% started complementary

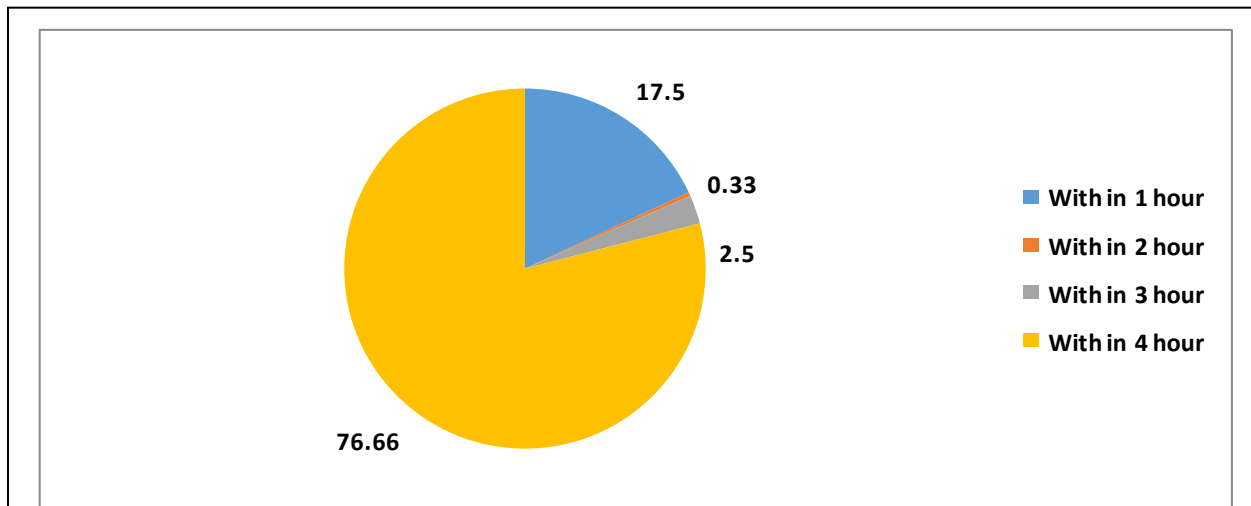


Figure 1: Practice of initiation of breast feeding after child is born in (%)

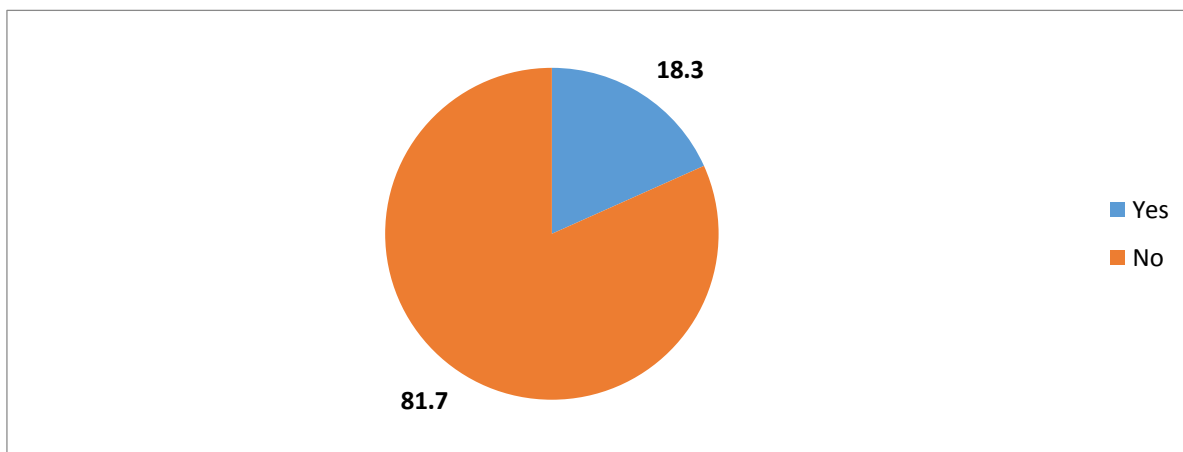


Figure 2: Classification of mothers on the basis of knowledge about exclusive breast feeding Complementary Feeding practices in (%)

Knowledge regarding Exclusive Breastfeeding

Figure 2 shows poor knowledge among mothers regarding exclusive breastfeeding. 98 (81.7%) mothers reported that they are not aware of exclusive breast feeding whereas only 22(18.3%) mother reported about having knowledge of exclusive breast

feeding to their child after six months but 40.8% of the mothers reported of starting complementary feeding before six months. Table 4 shows common food group provided by mothers to their children during lunch time. Majority of the mothers 66.7% provided carbohydrate sources and 17.5% provided legume sources as a common food to a child. Only 15.8% provided common food as fruits, meat and milk sources to a child. Table 5

Table 3: Distribution of Knowledge about Complementary Feeding Practices

Knowledge about complementary practices	Number (%)
Yes	120 (100)
No	-
Total	120 (100)
If yes when did you start	
Before 6 month	49 (40.8)
After 6 month	70 (58.3)
Did not know	1 (0.83)
Total	120 (100)

Table 4: Classification according to Food Groups consumed by Children

Common food during lunch time	Number (%)
Fruits	9 (7.5)
Carbohydrates sources	80 (66.7)
Legumes	21 (17.5)
Meat and milk sources	10 (8.3)
Total	120 (100)

Table 5: Classification according to viscosity of complementary food fed to children

Viscosity of complementary food	Number (%)
Like honey	13 (10.8)
Thin like water	34 (28.3)
Semi solid	73 (60.8)
Total	120 (100)

shows poor knowledge among mothers regarding consistency of complementary food provided to children. Most of the mothers 60.8% reported of providing semisolid viscous food whereas 28.3% of the mothers provide water consistency food to their child. Only 13 (10.8%) mothers reported of providing viscous nutritious food like honey.

Nutritional status of Child

Figure 3 shows the nutritional status indicators of a child according to Weight for

Age, Height for Age and Weight for Height categorized according to WHO Child Growth Standards. 26 (21.7%) children were found to be moderate underweight while 7 (5.8%) children were severely underweight. The prevalence of moderate stunting was found to be in 23 (19.2%) children while 18 (15%) children were found to be severely stunted. Also, the prevalence of moderate wasting was found to be in 13 (10.8%) children while only 1 (0.8%) child was found to be severely wasted.

Association between different Factors with Nutritional Status of Children

Different factors like initiation of breastfeeding, initiation time of complementary feeding, mothers' knowledge about complementary feeding etc. was associated with nutritional status of child (weight for age, height for age and weight for height) but no such association was observed in this study.

To see the association between Weight for age and complementary feeding initiation before 6 six months of child, Chi-square test was performed. No significant association was observed as p value was observed to be greater than 0.05 as shown in table 6 and 7. Similarly, there is no significant association between practice of complementary feeding initiation before 6 months and height for age of a child.

DISCUSSION

Children nutritional status is an image of their overall health. When children have adequate access to nutritious foods and proper health care from family, they achieve their adequate growth potential and become well nourished. WHO and UNICEF

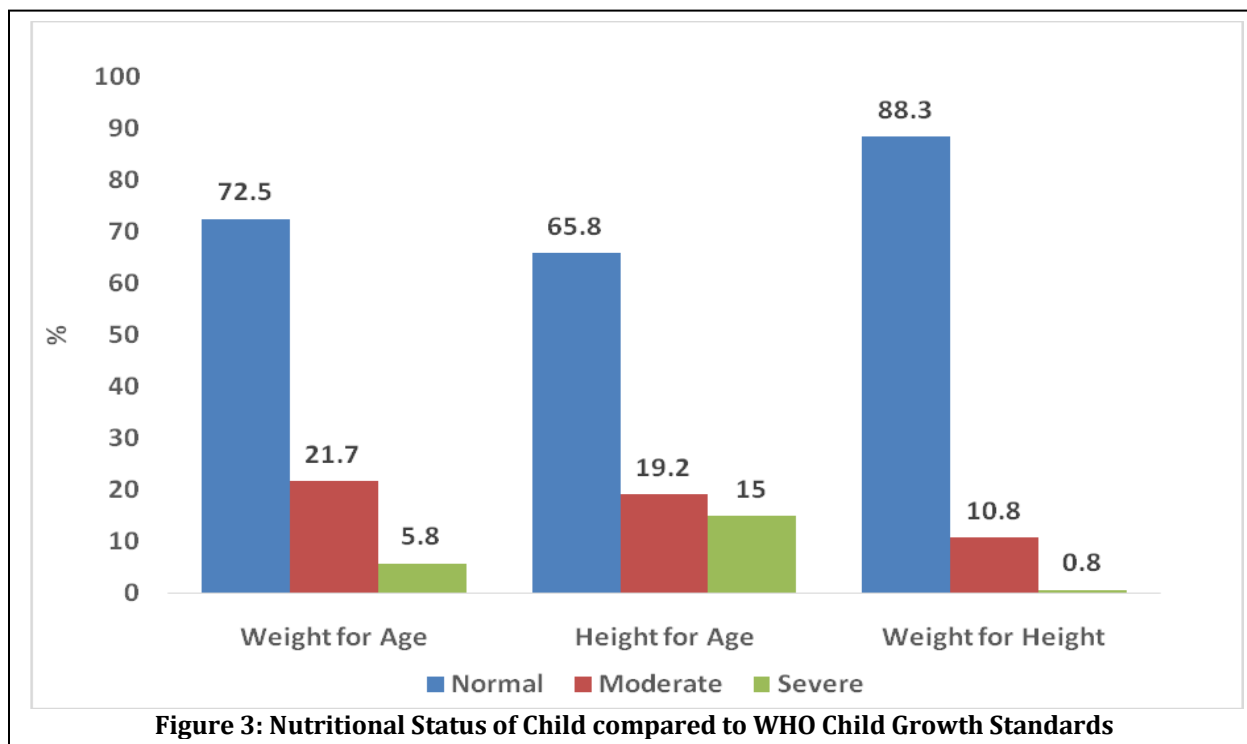


Table 6: Association between Weight of Child with the Initiation of Complementary Feeding Time

			Weight for Age			Total
			Normal Weight	Moderate Underweight	Severe Underweight	
Complementary Feeding Before 6 months	Yes	Count (%)	63 (78.8%)	14 (17.5%)	3 (3.8%)	80 (100.0%)
	No	Count (%)	24 (60.0%)	12 (30.0%)	4 (10.0%)	40 (100.0%)
Chi-Square Test						
			Value	Df	Asymp. Sig. (2-sided)	
Pearson Chi-Square			5.002 ^a	2	.082	

Table 7: Association between Height for Age with the Initiation of Complementary Feeding Time

			Height for Age			Total
			Normal Height	Moderate Stunting	Severe Stunting	
Complementary Feeding Before 6 months	Yes	Count (%)	54 (67.5%)	14 (17.5%)	12 (15.0%)	80 (100.0%)
	No	Count (%)	25 (62.5%)	9 (22.5%)	6 (15.0%)	40 (100.0%)
Chi-Square Test						
			Value	Df	Asymp. Sig. (2-sided)	
Pearson Chi-Square			.449 ^a	2	.799	

advocate that children be breastfed within one hour of birth, to be breastfed exclusively for the first six months of life, and continued

to be breastfed for up to two years of age and beyond. Also, at six months, breastfeeding should be combined with nutrient dense and

diverse, safe, age-appropriate feeding of solid, semi-solid and soft foods [10].

In this survey, 17.5% of mothers initiated breastfeeding within 1 hour of birth which is quite lower than figure of MICS study which shows 48.7% of mothers initiating breastfeeding within 1 hour of birth. It is evident from this survey that, majority of the mothers are found to be lacking in knowledge regarding exclusive breastfeeding. Only 22(18.3%) mothers knew the meaning of exclusive breastfeeding while others had no idea of it which could have impact in children nutritional status.

In this survey, 34(28.3%) of the mothers prepared water like complementary food for their baby. This tends to increase the amount of water consumed by a child causing fullness and hence lack of energy leading to growth faltering. Only, 13(10.8%) mothers prepared honey like consistency food for their children which is appropriate for their child. Majority of the mothers, 70(58.3%) started complementary feeding to their child after six months which shows that the mother had knowledge about the time to start complementary feeding but 49 (40.8%) mothers lacked knowledge on when to start complementary feeding and started it before 6 months.

Regarding nutritional status of child, 26 (21.2%) children were found to be moderate underweight while 7(5.8%) children were severely underweight. A survey Demographic and Health Survey done in Nepal also showed that 28.8% of children were moderately underweight while 7.7% were found to be severely underweight among children below 5 years of age [4]. Also more recent study, Nepal Multiple Indicator Cluster Survey

shows that, one in three children under five in Nepal are moderately or severely underweight (30%) and 9% are classified as severely underweight [10].

The prevalence of moderate stunting was found to be in 19.2% of the children while 15% of the children were found to be severely stunted. While Demographic and Health Survey of Nepal showed that 40.5% of children were moderately stunted while 16.2% of the child were severely stunted among children below 5 years of age [4]. Also, more than one-third (37%) are moderately or severely stunted or too short for their age and 16% are severely stunted according to MICS study [10]. The prevalence of moderate wasting was found to be in 10.8% of the children while only 1 child was found to be severely wasted. NDHS 2011 showed that 10.9 percent of the children were moderately wasted while 2.6 percent of the children were severely wasted among children below 5 years of age [4].

No significant association was observed between various socio-economic factors, complementary feeding practices and nutritional status of a child. Although a study done in western Kenya showed that children who were introduced to complementary foods before 6 months had an increased risk of being underweight, no such association was observed in this study [14].

CONCLUSION

In addition to several nutrition related research being conducted in Nepal, this study also approves the prevalence of poor nutritional status in Tamang community of Aambhanjyang VDC, Makawanpur district of

Nepal. Although several nutrition related community level programs are being launched in Nepal from different (non) government sectors, there is still more to be done to reduce the prevalence of undernutrition and to change the behavior of our community and mothers regarding proper nutrition and health care for their baby.

Lack of knowledge is a major hindrance in a developing country like Nepal. Although no significant association was observed in this study which might be due to limitation in sample size or other factors, there exists significant association between socio-economic status, knowledge of community mothers, behavior and practice of nutrition related care with indicators of nutrition status. Hence, more rigorous programs and activities are required targeting mothers at community level to sensitize the importance of nutritional care and to uplift country's nutritional status.

LIMITATION

The samples were entirely from Tamang community of Aambhanjyang VDC of Makawanpur and cannot be solely generalized for other ethnic groups or other regions of Nepal.

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AUTHOR'S CONTRIBUTION

PP- Creation of first draft and reviewed critically, descriptive analysis, preparation of final manuscript; **AA-**creation of first draft and reviewed literatures, preparation of final manuscript; **PL-** data collection and drafting the study; **RHA-** revision of the draft and suggestions.

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