

Original Research Article

## Nutritional Status of Primary School Children in Pumdi Bhumdi Village of Kaski District, Nepal

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### ABSTRACT

**Introduction:** Child nutrition and health is the most important part of human life where socio-demographic factors affect their health as well as determine the health of future.

**Objectives:** To assess the nutritional status and associated socio-demographic factors among primary school children in Pumdi Bhumdi village of Kaski district, Nepal.

**Methods:** A cross sectional study was conducted in 290 primary school children of age group of 5 to 10 years selected from 6 public schools using simple random sampling in between October to December, 2013 using observation, interview and anthropometric assessment. Z scores were calculated using WHO AnthroPlus software version.1.0.4. Statistical analysis was done using Statistical Software for Social Sciences Version 16.

**Results:** The study revealed 35.4%, 44.2%, 12.3% prevalence rate of underweight, stunting and wasting respectively. The socio demographic factor significantly associated with underweight were family occupation ( $\chi^2$  value =15.679, P value=0.047) and economic status of family ( $\chi^2$  value =15.464, P value<0.001). Education status of mother ( $\chi^2$  value =10.691, P value=0.014) was significantly associated with wasting.

**Conclusion:** Malnutrition constituted public health problem and should be given higher priority in the implementation of the health program with a particular attention to the vulnerable group.

**Key words:** Primary school children; Socio demographic factors; Stunting; Underweight; Wasting.

### INTRODUCTION

Nutrition is the fundamental pillar of human life, health and development across the life span which is essential for survival from the earliest stage of fetal development, at birth to old age good nutrition as well as physical growth, mental development, performance and productivity, health and well-being. Nutrition status is the result of complex interaction between the food we eat, our health and the surrounding in which

we live. <sup>[1]</sup> Malnutrition, which is the direct result of insufficient food intake or repeated infectious diseases or combination of both not only directly affects the children by reducing their physical and mental performance but also makes the situation worse by making the children susceptible to infection. Child malnutrition is a widespread problem having international consequences because good nutrition is an essential determinant for their well-being. <sup>[2]</sup>

Malnutrition continues to be a serious public health problem and has for a long time been recognized as a consequence of poverty since most of the world's malnourished children live in the developing nations of Asia, Africa and Latin America where those mostly affected are from low income families. [3] Underweight and thinness are most prominent in populations from South-East Asia and Africa, whereas in Latin America the prevalence of underweight or thinness was generally below 10%. [4] The children from households with a low or very low socioeconomic status have 2.5 times the risk of being underweight relative to children who came from households with middle to upper socioeconomic status. [5] Low levels of nutrition adversely affect physical and mental growth of children. Malnutrition in early childhood is associated with significant functional impairment in adult life, reduced work capacity and decreasing economic productivity. [6,7] The most neglected form of human deprivation is malnutrition, particularly among preschool and school children. Low weight for age is referred to underweight, low height for age namely stunting also called chronic malnutrition and low weight for height is an indicator of low body mass (wasting) and also called acute malnutrition. [8] There is a clear evidence to support the significance of nutritional status in the prevention of both acute and chronic diseases. The early development of cognitive skills, emotional well-being, social competence and sound physical and mental health has a strong foundation for success well into the adult year. These abilities are critical prerequisites for economic productivity and responsible citizenship throughout life. Anthropometric assessment is a simple tool and serves as the most useful screening test especially in developing countries of the world, where malnutrition is widely prevalent and the resources are limited.

In Nepal, 41% of the total population is below 15 years of age. The school children aged 5 to 15 years constitute about 27% of the total population who are exposed to the risk of accident, injuries, infections and malnutrition. About 19.6% of total primary school age children are never enrolled in school and 45.4% of children enrolled in primary school dropout without completing grade five. [9] The rural primary school going children have increased from 86 percent in 2006 to 89 percent in 2011. [10] However, nutritional deprivation is rampant among them ranging in magnitude from 20-80%. Since deficient physical growth is naturally reflected in their suboptimal mental achievement, the assessment of nutritional status of this segment of population is essential for making progress towards improving overall health of the school age children. [11] Evidences show that under nutrition as indicated by their stunting, wasting or wasting and stunting are combined along with the features of various micronutrient deficiency disorders. [12] The percentage of malnourished children remained almost constant at 3% in 2068/69. [13] About 26% of the students are found to be undernourished and 13% stunted, 12% wasted and only 1% both stunted and wasted in primary schooling children of western region of Nepal. [14]

This study was carried out to assess the nutritional status and associated socio-demographic factors among primary school children in Pumdi Bhumdi village of Kaski district, Nepal.

## **MATERIALS AND METHODS**

A cross sectional study was conducted among the primary school children of age group of 5 to 10 years in public schools of Pumdi Bhumdi village of Kaski district, Nepal to assess the nutritional status and associated socio-demographic factors. The study was done in 290 students of 6 public schools selected randomly from

a total of 14 schools simple random sampling technique. Data collection was done in between October-December, 2013 using observation method, interview method and anthropometric assessment. Observation checklist and semi structured questions were used for the purpose of observation and interview respectively. Non stretchable measuring tape and weighing machine were used for measuring height and weight respectively and entered in WHO AnthroPlus software v.1.0.4 for calculating nutritional status. Cut off value of was used for  $<-2$  was used for classification of underweight, stunting and wasting with  $<-2$  to  $>-3$  for moderate  $<-3$  for severe form. Collected data from interview and nutritional status were entered and analyzed statistically using SPSS v. 16. Frequency tabulation and chi square test were done. P-value of less than 0.05 was taken to indicate statistically significance and value less than 0.01 to indicate highly statistically significance. Pre-testing was done among the 10% students of total sample size. Pre-tested samples were excluded from study. Approval was taken from Department of Public Health, Pokhara University as well as the District Education Office (DEO), Kaski for the conduction of research. Written informed consent was taken from school administration as well as from students and their participation in the study was voluntary. Clarity of the purpose of study was done among the school administration, students and their parents in every school prior to data collection. Confidentiality of each respondent has been maintained strictly.

## RESULTS

### General information

Mean age of the school children was 7.98 years. Likewise, mean weight and height were 20.56Kg and 116.96cm respectively. Out of the 290 children, 156(53.8%) were females followed by

134(46.2%) males. Majority of respondents, 278(95.9%) were Hindu, 9(3.1%) Christian and only 3(1%) were Buddhist. The major ethnic group was Upper caste group as 158(54.9%), followed by 96(33.3%) so called dalits and relatively advantaged and disadvantaged janajati consisted of 20(6.9%) and 16(4.9%) respectively. Additionally, more than half 156(53.8%) of respondents were from nuclear family, 114(39.9%) were from joint family and only 20(6.9%) were from extended family. Similarly, head of the family were engaged mainly in labor with 78(26.9%), followed by service 71(24.5%), agriculture 64(22.1%), foreign employee 48(16.6%) and only 29(10%) were engaged in business. Regarding average monthly family income, more than half 148(51%) had monthly family income of twenty to thirty thousand, 88(30.3%) had ten to twenty thousand, 35(12.1%) had thirty to forty thousand, 13(4.5%) had less than ten and only 6(2.1%) had more than forty thousand. More than half 155(53.5%) of mother had primary education, 70(24.1%) had secondary education and 40(13.8%) were literate and only 25(8.6%) had higher secondary or above education. Majority of mother group were engaged in agriculture 256(88.3%), whereas only 24(8.3%) and 10(3.4%) were involved in labor and service respectively. Among six schools, all school have had clean and managed (well ventilated) classroom. Likewise, only four schools have had safe drinking water facility and rest of two school's children use water directly from tap for the purpose of drinking water. There was available of separate latrine (toilet) for boys and girls but sanitation was not satisfactory. Among six schools visited only four of school children were found to wash their hand after toilet use while at school, among four of them only two schools have facility of water and soap and student were also use facility properly. In addition, all school have had well managed waste disposal area. Only

three schools provide mid day meal facility for student at free of cost and rest of other have canteen at the periphery of school.

### Nutritional status of school children

Regarding underweight, majority of the students, 186(64.6%) were normal and 103(35.4%) were suffering from malnutrition. Likewise, in case of stunting, 162(55.8%) were normal and 128(44.2%) were stunted. Similarly, 37(12.3%) of the students were wasted. (Table 1)

**Table 1: Anthropometric assessment (n=290)**

Anthropometric assessment	Frequency (n=290)	Percent
Underweight(weight for age)		
Normal	187	64.6
Moderate	71	24.3
Severe	32	11.1
Stunting (height for age)		
Normal	162	55.8
Moderate	88	30.3
Severe	40	13.9
Wasting (weight for height)		
Normal	253	87.7
Moderate	33	10.9
Severe	4	1.4

Majority of the boys, 83(61.98%) and girls, 105(67.31%) were normal. Regarding underweight, 51(38.05%) boys and 32.68% girls were found to be moderately and severely underweight. This

shows that the rate of underweight is higher among boys than among girls. (Table 2)

**Table 2: Nutritional status (weight for age) as per sex (n=290)**

Sex	Normal	Underweight	
		Moderate	Severe
Male	83 (61.98)	38 (28.35)	13 (9.7)
Female	105 (67.31)	32 (20.51)	19 (12.17)

#Figures in parenthesis indicate percent

Stunting among boys and girls were found to be 48(43.28%) and 67(42.98%) respectively. It was found that the rate of stunting was higher among boys than among girls. (Table 3)

**Table 3: Nutritional status (height for age) as per sex (n=290)**

Sex	Normal	Stunting	
		Moderate	Severe
Male	76 (56.71)	37 (27.61)	21 (15.67)
Female	89 (57.05)	48 (30.76)	19 (12.17)

#Figures in parenthesis indicate percent

Wasting among boys and girls were found to be 22(16.42%) and 14(8.97%) respectively which shows that rate of wasting was higher among boys than among girls. (Table 4)

**Table 4: Nutritional status (weight for height) as per sex (n=290)**

Sex	Normal	Wasting	
		Moderate	Severe
Male	112 (83.58)	21 (15.67)	1 (0.75)
Female	142 (91)	11 (7.05)	3 (1.92)

#Figures in parenthesis indicate percent

**Table 5: Association between underweight and socio-demographic characteristics**

Characteristics	Normal	Underweight	$\chi^2$ value	P-value
Education level of mother				
Primary /lower	121 (61.43)	76 (38.57)	3.347	0.188
Secondary/above	67 (72.05)	26 (27.95)		
Occupation of mother				
Agriculture	163 (63.68)	93 (36.32)	8.143	0.086
Labor	15 (62.5)	9 (37.5)		
Service	7 (70)	3 (30)		
Father's occupation				
Agriculture	37 (57.81)	27 (42.19)	15.679	0.047*
Labor	47 (60.25)	31 (39.74)		
Service	46 (64.77)	25 (35.23)		
Business	16 (55.17)	13 (44.83)		
Foreign employee	32 (66.67)	16 (33.33)		
Economic status				
<20 thousand	68 (67.32)	33 (32.67)	15.464	<0.001**
≥ 20 thousand	140 (74.08)	49(25.92)		
Type of family				
Nuclear	100 (64.11)	56(35.89)	5.479	0.065
Other (Joint, extended)	82 (61.19)	52(38.81)		

#Figures in parenthesis indicate percent

\*Statistically significant at p<0.05

\*\*Statistically highly significant at p<0.001

## Association between nutritional status and socio-demographic characteristics

Underweight was found to be significantly associated with family occupation ( $\chi^2$  value =15.679, P value=0.047) and highly significantly associated with economic status of family ( $\chi^2$  value =15.464, P value<0.001). However, no significant association was found with other socio demographic characteristics. (Table 5)

None of the socio-demographic variables were statistically significant with stunting in child. (Table 6)

Education status of mother ( $\chi^2$  value =10.691, P value=0.014) was significantly associated with wasting where as head of family occupation, mother's occupation, economic status of family and family type had no significant association with wasting of children. (Table 7)

**Table 6: Association between stunting and socio-demographic factors**

Characteristics	Normal	Stunted	$\chi^2$ value	P-value
Education level of mother				
Primary or lower	108 (54.82)	89 (45.18)	2.129	0.546
Secondary or above	58 (62.37)	35 (37.63)		
Occupation of mother				
Agriculture	147 (57.42)	109 (42.57)	0.350	0.986
Labor	13 (54.16)	11 (45.83)		
Service	6 (60)	4 (40)		
Father's occupation				
Agriculture	38 (59.38)	26 (40.62)	4.420	0.817
Labor	45 (57.69)	33 (42.3)		
Service	40 (56.34)	31 (43.65)		
Business	15 (51.72)	14 (48.26)		
Foreign employee	24 (50)	24 (50)		
Economic status				
<20 thousand	60 (59.4)	40 (39.6)	1.553	0.460
≥20 thousand	117 (61.9)	69 (36.49)		
Type of family				
Nuclear	95 (60.89)	61 (39.1)	2.658	0.265
Other (Joint, extended)	80 (59.7)	53 (39.54)		

#Figures in parenthesis indicate percent

**Table 7: Association of wasted children with socio-demographic factors**

Characteristics	Normal	Wasted	$\chi^2$ value	P-value
Education level of mother				
Primary or lower	176 (89.34)	21 (10.65)	10.691	0.014*
Secondary or above	84 (90.32)	9 (9.68)		
Occupation of mother				
Agriculture	225 (87.89)	30 (11.71)	1.436	0.838
Labor	20 (83.33)	4 (16.67)		
Service	9 (90)	1 (10)		
Father's occupation				
Agriculture	55 (85.93)	9 (14.06)		
Labor	68 (87.19)	10(12.81)	14.187	0.077
Service	60 (84.5)	11 (15.49)		
Business	25 (86.20)	4 (13.79)		
Abroad	43 (89.58)	5 (10.41)		
Economic status				
<20 thousand	84 (83.17)	19 (16.83)	2.342	0.310
≥20 thousand	165 (87.3)	23 (12.17)		
Type of family				
Nuclear	138 (88.46)	18 (11.54)	0.110	0.946
Other (Joint, extended)	117 (87.31)	17 (12.68)		

#Figures in parenthesis indicate percent

\*Statistically significant at p<0.05

## DISCUSSION

The study showed that, more than half of students were girls (53.8%) where as

only 48.2% were boys and the ratio of girls to boys was 1.54:1. Literacy rate of mother was found 32.7% having education

secondary or above and 53.5% having primary education. Literate mother adopt many improved behavior which are related to maternal and child health care, feeding practices to their child which ultimately affect the nutritional status of children. [14] Under nutrition in the students (35.4%) is quite higher than the study conducted in western Nepal in 2011 [14] where it was reported 26% and lower than the study conducted in eastern Nepal in 2004 [15] where it was reported 61%. Even though girls predominate boys in number, the proportion of undernourished was more among boys than girls. 38.03% boys and 32.68% girls were malnourished which is similar to the study conducted in western Nepal in 2011 [14] where it was reported 27% boys and 25% girls were malnourished in selected students. The proportion of malnourished was more in boys may be due to the reason that the female children from very poor families do not attend the school. [14]

As stunting reflects the past nutrition and that indicate the children may have had experience with poor nutritional supplement and suffered from infection during childhood. [16] More children (44.2%) were found to be stunted. On contrast to this finding, study conducted by Manandhar N et al [2] found 7.69% and the study conducted by Shrestha I et al in 2003 [17] in Pokhara valley found 14.9%. The regional variation in result might be due to good health care facilities, proper nutrition supplement, good water supply, etc. [2] Wasting prevalence (12.3%) is similar study conducted in Pokhara valley which found 14.9% wasted school children. [17] Wasting (acute malnutrition) was low as compared to proportion of stunting (chronic malnutrition) which might be due to the provision of mid day meal at school.

There are so many factors that directly or indirectly affect the nutritional status of children like socio-economic status,

mother education status, food availability, access of safe drinking water and national per capita which are important underlying determinants of child malnutrition. High prevalence of low birth weight, inadequate child care, poor feeding practices, poor hygiene, low education and economic status of women in society are major factors of high prevalence of child malnutrition. [14] A significant association of education status of mother, family occupation and economic status of household, feeding practices to child with the child malnutrition was found in the study is similar to the findings of the study conducted in western region of Nepal. [14]

No significant association between family size and nutrition status of children in the study is similar to the study conducted by Khan MA et al at Lahore in 2010 [18] among primary school children. On contrary to the findings, Nabag FO in 2011 in Sudan [19] found that the smaller the family size better becomes the nutritional status.

The school environment where children spend at least six hour per day is the most responsible place for the mental development as well as development of healthy behaviors. The study found that the school environment of studied schools was satisfactory. A good quality meal will improve nutritional status, which is vital for mental development and consequently academic performance. The study revealed that the provision of mid day meal to the school children was satisfactory from which helps in the reduction of acute malnutrition i.e. wasting.

## CONCLUSION

Underweight and stunting were found to be common form of malnutrition in primary school children than wasting. Malnutrition was found to be caused by number of intertwining factors that form a web of causation of malnutrition and

enhance each other. Socio-economic and education status of mother were found to be significant factor contributing malnutrition in children. Health education focusing on nutrition should be given to school children as well as their mother to address malnutrition effectively and for nutritional wellbeing. More efforts should be made by health and health related agencies to identify the cause of malnutrition and for its solution. Besides these, more research studies should be carried out to determine and prevent the childhood malnutrition at national, regional and the international level.

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