Assessment of Nutritional Status of Under Five Years Children in Kolati Bhumlu of Kavrepalanchok District

Amita KC[1], Ranendra Bohara[2]

[1]Assistant Professor, Department of Public Health, Hope International College, Faculty of Medical and Allied Sciences, Purbanchal University, Nepal

[2]Public Health Inspector, Panga Balkumari Health Post, Kirtipur Municipality

Principal and Corresponding Author

Amita KC

Email: amita2013hope@gmail.com

https://orcid.org/0000-0001-9911-569X

ABSTRACT

Background

The nutritional status of children is one of the major indicators of child survival and a proxy indicator for the general health of the population. Malnutrition is a significant public health issue in the majority of developing nations and is particularly prevalent among children under five years of age. Mortality and morbidity among children under-five years of age are influence by nutritional status. The context of Nepal, more than one-third (36%) of children under-five years of age stunted or too short for their age. 10% of children wasted (too thin for height), a sign of acute malnutrition. 27% of children underweight or too thin for their age. These children had greater risk of severe acute malnutrition and death.

Objective

Study's objective was to assess the nutritional status of under-five year's children and factors associated with malnutrition.

Method

A descriptive cross-sectional study conducted in Kolati Bhumlu of Kavrepalanchok district of Nepal. A total of 115 under-five year'schildren and their mothers were included in study. Statistical Package for the Social Sciences (SPSS) version16was used to analyze the data.

Result

The prevalence of underweight was found to be 28.7% according to the classification of malnutrition based on Z- score .Similarly, the prevalence of wasting was found to be 18.3% and the prevalence of stunting was found to be 29.6%. According to Gomez's malnutrition classification (NCHS/WHO as standard) for Weight for age (underweight) 3.5%children were severely malnourished. According to Water-low's classification, regarding the height for age (stunting) 9.6% children were severely malnourished. Regarding MUAC measurement 7.8% children had severe malnutrition. The Gender of the child was associated with stunting.

Conclusion

In the study population, the high prevalence of malnutrition especially stunting among under-five years children. Taking weight, height, age, and mid- upper arm circumference (MUAC)

measurements of malnourished children more than three-fifths of them were below -2SD and nearly one-fourths were below -3SD which needs intervention.

KEYWORDS

Associated factors, Malnutrition, Nutritional status, Under-five years children

INTRODUCTION

Every form of malnutrition poses greater risks to human health. Under-nutrition and overweight are both significant causes of malnutrition globally, particularly in low- and middle-income nations. Malnutrition comes in different forms, such as under-nutrition (wasting or stunting), insufficient vitamins and minerals, overweight and obesity, which can lead to non-communicable diseases caused by diet.(WHO, 2023a)

Malnutrition is one of the most significant public health problems among low and middle-income countries. According to experts, nutrition is crucial for the nation's socio-economic growth and is crucial element of the Millennium development goals. The common cause of malnutrition is lack of access to healthy food. Poor feeding practices such as inadequate breastfeeding, feeding the unhealthy foods and not ensuring that the child gets enough nutritious foods contribute to malnutrition. (Chataut, Jonchhe, & Ghimire, 2020; Chataut & Khanal, 2016)

Protein-energy deficiency has been a widespread issue with health in third-world nations. Children who are undernourished frequently exhibit patterns of stunting and wasting. Acute nutritional deficiency and diseases (such as diarrhoea) in children can result in wasting, which was indicated by a decline in weight for height and arm-circumference or both. Stunting is defined by a decrease in height-for-age and is brought by a protracted nutritional deficit or sickness. Stunting and wasting have adverse effects on functionality. Anthropometric measurements, biochemical tests, clinical observations, functional evaluations, food surveys and ecological investigations are all part of nutritional assessment (Acharya et al, 2019).

Children who have more than four family members, nuclear families, living with someone other than their parents, mothers who have completed elementary school, fathers who lack a high school , children who do not attend school, lack of their own farmland and a history of chronic disease in children have all been found to be independent predictors of increased risks for underweight as well as independent predictors of elevated risks for stunting were male children who lived in urban areas, were raised in nuclear families, shared a home with someone other than their parents, had illiterate fathers and did not have their own agricultural property.(Bhusal, Bhattarai, Chhetri, & Myia, 2023)

The factors affecting nutritional status include low birth weight, mother's education, understanding of micronutrients (vitamin A, iron and iodine), care of diarrhoea, feeding practices and lack of maternal autonomy(Dhungana, 2014).

Globally in 2020, 149 million children under-five years were stunted (too short for age), 45 million were wasted (too thin for height) and 38.9 million were overweight or obese. Around 45% of deaths among children under-five years of age are due to under-nutrition. These mainly occur in low- and middle-income countries.(WHO, 2023b).

Malnutrition is a significant public health problem in Nepal and malnutrition rates ranking among the highest in the South Asia region. From 1996 to 2022 (NDHS) the national prevalence of stunting among children under-five years declined from 57% (severe) to 25% (moderate) , while wasting among the same age group dropped from 15% (severe) to 8% (moderate). Despite the gradual reduction in stunting and wasting, the low weight-for-age (underweight) continues to be a

80

significant impediment to health, social and economic development with the prevalence of underweight among children under-five years at 19% (NDHS 2022), Nepal faces with a moderate public health problem.

Among the many basic, underlying and immediate causes of malnutrition , poverty, lack of access to clean water and sanitation, poor hygiene practices, inadequate care and feeding practices for young children are the most pertinent ones.(DOHS, 2078/79(21/22)).

The objective of the study was to assess the nutritional status of under five years' children and factors associated with malnutrition.

METHODOLOGY

A descriptive cross-sectional study was conducted in the Kolati Bhumlu village development committee of the Kavrepalanchok district of Nepal to assess the nutritional status of under-five children and associated factors. A total of 115 under -five children and their mothers were included in the study. The VDC was selected purposively; a simple random probability sampling technique used for the sample selection.

The study was conducted from August 2016 to July 2017. Data was collected through face-to-face interviews using the questionnaire and anthropometric measurement by Sakir tape and Salter scale. Statistical Package for the Social Sciences (SPSS) 16 version used to analyze the data. The approval was taken from the Kolati Bhumlu Village development committee office. Informed consent taken from each of the participant before the interview.

RESULT

A total of 115 respondents were sampled, having children aged under -five years. Study's findings presented in the form of tabulation and their interpretation in different headings.

Demographic characteristics of the respondents

Table 1: Demographic distribution of respondents

Characteristics	Frequency (n=115)	Percent
Age of the mother		
15-19	5	4.3
20-24	40	34.8
25-29	32	27.8
30-34	21	18.3
35-39	13	11.3
above 40	4	3.5
Mean ± SD : 27.45 ± 6.054		
Age of the child		
less than 6	8	7.0
6-11 months	6	5.2
12-17 months	13	11.3
18-23 months	28	24.3
24-30 months	4	3.5

81

Characteristics	Frequency (n=115)	Percent
31-36 months	16	13.9
37-42 months	6	5.2
43-48 months	12	10.4
49-54 months	11	9.6
55-60 months	11	9.6
Mean ± SD : 30.31 ± 16.629		
Gender of the child		
Male	69	49.3
Female	71	50.7

The demographic characteristics of the respondents presents in Table 1. Age-wise distribution of the mothers showed the majority of the mothers (34.8%) were in the 20-24 years age group with a mean age of 27.45 years (SD : 6.054). Similarly, 24.3 per cent of children were in the 18-23 months age group with a mean age 30.31 months (SD: 16.629).

Table 2: Demographic distribution of respondents

Characteristics	Frequency (n=115)	Percent
No. of children		
≤ 2	68	59.1
3-4	37	32.2
> 4	10	8.7
Mean ± SD : 2.56 ± 1.258		
Type of Family		
Nuclear	64	55.7
Joint	51	44.3
Family size		
≤ 5	47	33.6
5-8	83	59.3
9-12	10	7.1
Mean ± SD : 5.65± 2.164		
Religion		
Hinduism	97	84.3
Buddhist	5	4.3
Christianity	13	11.3
Ethnicity		
Brahmin/ Chhetri	6	5.2
Janajati	83	72.2
Dalit	26	22.6

Out of 115 children, 50.7 per cent were female and 49.3% Per cent were male. 59.1 per cent respondents have one or two children (Mean ± SD: 2.56 ± 1.258). 55.7% respondents have the

82

nuclear family and 44.3 percents have the joint family. The mean family size of the respondents was 5.65 with a standard deviation of 2.164 (Mean ± SD: 5.65± 2.164). Most of the respondents were Hindu 84.3% followed by Christian 11.3%. Most of the respondents were Jana-jati (72.2%), followed by Dalits (22.6%).

Socio-economic characteristics of the respondents

Table 3: Socio-economic distribution of the respondents

Characteristics	Frequency (n=115)	Percent
Mother's educational level		
Illiterate	25	21.7
Primary level	66	57.4
Secondary level	22	19.1
Higher secondary level	2	1.7
Father's educational level		
Illiterate	27	23.5
Primary level	49	42.6
Secondary level	36	31.3
Higher secondary level	3	2.6
Occupation of mother		
Housewife	72	62.6
Agriculture	33	28.7
Labour	4	3.5
Business	5	4.3
Others	1	0.9
Father's occupation		
Agriculture	12	10.4
Service	5	4.3
Labour	66	57.4
Business	10	8.7
Foreign employment	7	6.1
Others	15	13.0
monthly income of the family		
Low (<Rs 3000)	2	1.7
Medium (Rs 3000-6000)	1	0.9
High (>Rs 6000)	112	97.4

Table 3 represents the socio-economic characteristics of the respondents. Among 115 respondents, 57.4% had a primary level of education and only 19.1 per cent had a secondary level of education and 21.7% were illiterate. Most of the respondents were housewives (62.6%). Most of the respondent's husbands were labor (57.4%).

Practice- related information

Table 4: Distribution of respondents based on practice

Characteristics	Frequency	Percent
Colostrums (n= 115)		
Yes	111	96.5
No	4	3.5
Exclusive breastfeeding (n=108)		
<6 months	31	28.7
6 months	65	60.2
>6 months	12	11.1
Initiation of the complementary feeding (n=108)		
Below 6 months	34	31.5
6 months	61	56.5
After 6 months	13	12.0
Continued breastfed (n=115)		
Continuing	69	60.0
less than 2 years	2	1.7
more than 2 years	44	38.3

Table 4 shows the distribution of the practice-related of breastfeeding. Most of the children (96.5%) were fed with colostrum. About 60.2% of the children out of 108 children, aged 6-59 months got exclusive breastfeeding for six months. About 56.5% of children received timely initiation of complementary feeding. Out of 115 children, 60% of children were continuing breastfeeding, whereas 1.7% dropped in less than two years and 38.3% continued for more than two years.

Classification of malnutrition based on a percentage of the median

Table 5: Distribution of respondents by malnutrition classification based on a percentage of median

Percentage of median	Frequency (n=115)	Percent
Weight for age		
90-110% (Normal)	30	26.1
75 - 89% (Mildly malnourished)	62	53.9
60 - 74 % (Moderately malnourished)	19	16.5
< 60% (Severely malnourished)	4	3.5
Weight for height		
> 90% (Normal)	53	46.1

80 - 89% (Mildly malnourished)	47	40.9
70 - 79% (Moderately malnourished)	12	10.4
< 70% (Severely malnourished)	3	2.6
Height for age		
> 95% (normal)	60	52.2
90 - 94% (Mildly malnourished)	27	23.5
85 - 89% (Moderately malnourished)	17	14.8
< 85% (Severely malnourished)	11	9.6
Mid- upper arm circumference (MUAC)		
> 13.5cm (satisfactory)	89	77.4
12.5 - 13.5 cm (mild-moderate malnutrition)	17	14.8
< 12.5 cm (severe malnutrition)	9	7.8

Table 5 represents the classification of malnutrition for weight for age, weight for height and height for age based on the percentage of the median among 115 under-five years aged children. Based on Gomez's classification of weight for age (Underweight), only 26.1% of children under 59 month's age were normal (90-110%). While, more than half (53.9%) were mildly malnourished (75-89%), 16.5% were moderately malnourished (60 - 74 %) and 3.5% were severely malnourished (<60%).

Based on Waterlow's classification for Weight for height (wasting), less than half (46.1%) of children under 59 months age were normal (>90%). While, 40.9% were mildly malnourished (80-89%), 10.4% were moderately malnourished (70-79 %) and 2.6% were severely malnourished (<70%).

Based on Waterlow's classification for Height for age (Stunting), 52.2% children aged under 59 months were normal (>95%). While, 23.5% were mildly malnourished (90-94%), 14.8% were moderately malnourished (85-89 %) and 9.6% were severely malnourished (<85%).

Classification of malnutrition based on the Z- score

Table 6: Distribution of respondents by classification of malnutrition based on the Z-score

Z- score values	Frequency (n=115)	Percent	Prevalence
Weight for Age (WAZ)			
-2 < Z-score < +2 (Adequate)	82	71.3	28.70%
-3 < Z-score < -2 (Moderately malnourished)	21	18.3	
Z-score < - 3 (Severely malnourished)	12	10.4	
Weight for Height (WHZ)			
-2 < Z-score < +2 (Adequate)	94	81.7	18.30%
-3 < Z-score < -2 (Moderately malnourished)	15	13.0	
Z-score < - 3 (Severely malnourished)	6	5.2	
Height for Age(HAZ)			

-2 < Z-score < +2 (Adequate)	81	70.4	29.60%
-3 < Z-score < -2 (Moderately malnourished)	16	13.9	
Z-score < - 3 (Severely malnourished)	18	15.7	

Table 6 represents the classification of malnutrition for weight for age, weight for height and height for age based on the Z-score. For weight for age (WAZ), 71.3% of children aged under 59 months had adequate nutritional status (-2< Z-score < +2), 18.3% of children were moderately malnourished (-3 < Z-score < -2) and 10.4% of children were severely malnourished (Z-score < - 3).

For weight for height (WHZ), 81.7% of children aged under 59 months had adequate nutritional status (-2< Z-score < +2), 13% of children were moderately malnourished (-3 < Z-score < -2) and 5.2% of children were severely malnourished (Z-score < - 3).

Similarly, for height for age (WAZ), 70.4% of children aged under 59 months had adequate nutritional status (-2< Z-score < +2), 13.9% of children were moderately malnourished (-3 < Z-score < -2) and 15.7% of children were severely malnourished (Z-score < - 3).

The table also showed that the prevalence of underweight, wasting and stunting was found 28.7%, 18.3% and 29.6%, respectively.

Association between different variables and Underweight, Wasting and Stunting
Table 7: Association between demographic characteristics and underweight, wasting and stunting

Characteristics	Prevalence Of Underweight			Prevalence of Wasting			Prevalence of Stunting		
	Normal	Under-weight	p-value	Normal	Wasted	p-value	Normal	Stunted	p-value
Age of the child									
≤ 6 months	8	0	0.481	7	1	0.308	7	1	0.256
	7.0%	0.0%		6.1%	.9%		6.1%	.9%	
7-12 months	5	1		3	3		6	0	
	4.3%	.9%		2.6%	2.6%		5.2%	0.0%	
13-24 months	29	12		35	6		31	10	
	25.2%	10.4%		30.4%	5.2%		27.0%	8.7%	
25-36 months	14	6		18	2		13	7	
	12.2%	5.2%		15.7%	1.7%		11.3%	6.1%	
37-48 months	12	6		14	4		11	7	
	10.4%	5.2%		12.2%	3.5%		9.6%	6.1%	
>48 months	14	8		17	5		13	9	

86

Characteristics	Prevalence Of Underweight			Prevalence of Wasting			Prevalence of Stunting		
	Normal	Under-weight	p-value	Normal	Wasted	p-value	Normal	Stunted	p-value
	12.2%	7.0%		14.8%	4.3%		11.3%	7.8%	
Gender of the child									
Male	38	13	0.498	44	7	0.261	41	10	0.037*
	33.0%	11.3%		38.3%	6.1%		35.7%	8.7%	
Female	44	20		50	14		40	24	
	38.3%	17.4%		43.5%	12.2%		34.8%	20.9%	
No. of child									
≤ 2	51	17	0.292	55	13	0.775	45	23	0.229
	44.3%	14.8%		47.8%	11.3%		39.1%	20.0%	
> 2	31	16		39	8		36	11	
	27.0%	13.9%		33.9%	7.0%		31.3%	9.6%	
Types of family									
Nuclear	49	15	0.163	54	10	0.412	44	20	0.657
	42.6%	13.0%		47.0%	8.7%		38.3%	17.4%	
Joint	33	18		40	11		37	14	
	28.7%	15.7%		34.8%	9.6%		32.2%	12.2%	

*Significant at $p < 0.05$

Table 8: Association between social characteristics and underweight, wasting and stunting

Characteristics	Prevalence of Underweight			Prevalence of Wasting			Prevalence of Stunting		
	Normal	Under-weight	p-value	Normal	Wasted	p-value	Normal	Stunted	p-value
Religion									
Hinduism	69	28	0.27	79	18	0.516	68	29	0.89
	60.0%	24.3%		68.7%	15.7%		59.1%	25.2%	
Buddhist	5	0		5	0		4	1	
	4.3%	0.0%		4.3%	0.0%		3.5%	0.9%	
Christianity	8	5		10	3		9	4	
	7.0%	4.3%		8.7%	2.6%		7.8%	3.5%	
Ethnicity									
Brahmin/ Chhetri	3	3	0.42	3	3	0.116	2	4	0.082
	2.6%	2.6%		2.6%	2.6%		1.7%	3.5%	
Janajati	59	24		69	14		62	21	
	51.3%	20.9%		60.0%	12.2%		53.9%	18.3%	
Dalit	20	6		22	4		17	9	
	17.4%	5.2%		19.1%	3.5%		14.8%	7.8%	

Table 9: Association between socio-economic characteristics and underweight, wasting and stunting

Characteristics	Prevalence of Underweight			Prevalence of Wasting			Prevalence of Stunting		
	Normal	Under-weight	p-value	Normal	Wasted	p-value	Normal	Stunted	p-value
Mother's education level									
Illiterate	14	11	0.099	20	5	0.547	15	10	0.424
	12.2%	9.6%		17.4%	4.3%		13.0%	8.7%	
Primary level	48	18		56	10		48	18	
	41.7%	15.7%		48.7%	8.7%		41.7%	15.7%	
Secondary or above-level	20	4		18	6		18	6	
	17.4%	3.5%		15.7%	5.2%		15.7%	5.2%	
Father's education level									
Illiterate	20	7	0.908	21	6	0.627	22	5	0.328
	17.4%	6.1%		18.3%	5.2%		19.1%	4.3%	
Primary level	34	15		42	7		32	17	
	29.6%	13.0%		36.5%	6.1%		27.8%	14.8%	
Secondary or above-level	28	11		31	8		27	12	
	24.3%	9.6%		27.0%	7.0%		23.5%	10.4%	
Mother's occupation									
Housewife agriculture	75	30	0.924	86	19	0.882	73	32	0.488
	65.2%	26.1%		74.8%	16.5%		63.5%	27.8%	
Working	7	3		8	2		8	2	
	6.1%	2.6%		7.0%	1.7%		7.0%	1.7%	
Father's occupation									
Agriculture	7	5	0.294	9	3	0.523	8	4	0.762
	6.1%	4.3%		7.8%	2.6%		7.0%	3.5%	
Non agriculture	75	28		85	18		73	30	
	65.2%	24.3%		73.9%	15.7%		63.5%	26.1%	
Monthly family income									
<Rs 6000	3	0	0.266	2	1	0.494	3	0	0.255
	2.6%	0.0%		1.7%	0.9%		2.6%	0.0%	
≥ Rs 6000	79	33		92	20		78	34	
	68.7%	28.7%		80.0%	17.4%		67.8%	29.6%	

Table 10: Association between nutrition related variables and underweight, wasting and stunting

Characteristics	Prevalence of Underweight			Prevalence of Wasting			Prevalence of Stunting		
	Normal	Under-weight	p-value	Normal	Wasted	p-value	Normal	Stunted	p-value
Feed the baby with colostrum									
Yes	78	33	0.197	91	20	0.723	77	34	0.187
	67.8%	28.7%		79.1%	17.4%		67.0%	29.6%	
No	4	0		3	1		4	0	
	3.5%	0.0%		2.6%	0.9%		3.5%	0.0%	
Exclusively breastfeeding									
<6 months	22	9	0.17	24	7	0.559	23	8	0.658
	20.4%	8.3%		22.2%	6.5%		21.3%	7.4%	
6 months	42	23		53	12		43	22	
	38.9%	21.3%		49.1%	11.1%		39.8%	20.4%	
>6 months	11	1		11	1		9	3	
	10.2%	0.9%		10.2%	0.9%		8.3%	2.8%	
Initiation complementary feeding									
<6 months	24	10	0.129	27	7	0.56	25	9	0.594
	22.2%	9.3%		25.0%	6.5%		23.1%	8.3%	
6 months	39	22		49	12		40	21	
	36.1%	20.4%		45.4%	11.1%		37.0%	19.4%	
>6 months	12	1		12	1		10	3	
	11.1%	0.9%		11.1%	0.9%		9.3%	2.8%	
Continues breastfeeding for 2 years									
Yes	40	19	0.333	48	11	0.5	37	22	0.28
	65.6%	31.1%		78.7%	18.0%		60.7%	36.1%	
No	2	0		2	0		2	0	
	3.3%	0.0%		3.3%	0.0%		3.3%	0.0%	

DISCUSSION

A study conducted in Rupandehi District of Nepal with two hundred ninety-two children in 2008 found that according to Gomez malnutrition classification (NCHS/WHO as standard) for Weight for age, 5.8% had severe under-nutrition, 33.9% were moderately under-nutrition, and 42.5% of children were mild under-nutrition(Acharya, Gautam, Kaphle, & Neupane, 2013).Whereas the weight for age of under-five years of children in KolatiBhumlu, we found 3.5% of children were severely malnourished, 16.5% were moderately malnourished , and 53.9% of children were mildly malnourished.

A similar study conducted with 450 under-five years of children of Kapilvastu district presented that for weight for age (Z-score), 31.5% children were below the -2 SD and 11.5% children were below -3 SD.(Bhandari & Chhetri, 2013). Similarly, a study conducted by Dolakha and Kavre presented that 15.2% were -3< -2 SD and 3.7% children were below -3 SD with 18.9% overall prevalence of underweight(Chataut & Khanal, 2016). While, in this study, we found 18.3%

89

of children were between -3< -2 SD, and 10.4% of children were below -3 SD. The overall prevalence of underweight was found to be 28.7%, which is similar to the NDHS, report 2016 of 27% prevalence rate of underweight.

In the same study done in Kapilvastu district regarding the weight for height index age (Z-score), 16% of children were below the -2 SD and 6% of children were below -3 SD(Bhandari & Chhetri, 2013). Similarly, a study conducted byDolakha and Kavre presented that the overall prevalence of wasting in children was 7%, which was wholly incorporated by moderate acute malnutrition(Chataut & Khanal, 2016). Similar studies conducted in Mugu, Humlaand Dhankuta districts found 9.4%, 8.8% and 11% of the children were wasted respectively(Paudel et al., 2020).While, in this study, we found 13% children were between -3< -2 SD and 5.2% children were below -3 SD and the overall prevalence of wasting was found to be 18.3% which is greater than the NDHS report 2016 of 10% prevalence rate of wasting.

The study conducted in Rupandehi district, regarding the height for age according to the Waterlow's classification, 5.1% children were serevely malnourished, 14.7% children were moderately malnourished and 45.2% children were mildly malnourished(Acharya In al. 2013). Whereas, the height for age of under-five children of KolatiBhumlu, we found that 9.6% of children were severely malnourished, 14.8% of children were moderately malnourished and 23.5% were mildly malnourished.

Similarly, the study done byKapilvastu district, regarding the height for age (Z-score), 30.8% children were below the -2 SD and 25% children were below -3 SD[15].Similarly, a study conducted byDolakha and Kavre presented that 25.5% of children were between -3< -2 SD and 14.4% of children were below -3 SD with 39.9% overall prevalence of stunting(Chataut & Khanal, 2016).While, in this study, we found 13.9% children were between -3< -2 SD and 15.7% children were below -3 SD and the overall prevalence of stunting was found to be 29.6% which is lower than the NDHS report 2016 of 36% prevalence rate of stunting.

Regarding MUAC, the study done by Dolakha and Kavre districts showed that 8.6% of children had moderate acute malnutrition and 2.5% of children had severe acute malnutrition(Chataut & Khanal, 2016). This study found 14.8% of children had mild-moderate malnutrition,and 7.8% of children had severe malnutrition.

CONCLUSION

According to the classification of malnutrition based on Z- score, the prevalence of underweight was found to be 28.7%. Similarly, the prevalence of wasting was found to be 18.3%. In addition, the prevalence of stunting was found to be 29.6%.

According to Gomez's classification for weight for age (Underweight), about 26.1% of children aged under 59 months were normal (90-110%). While, more than half (53.9%) of children were mildly malnourished (75-89%), 16.5%of children were moderately malnourished (60 - 74 %), and 3.5% were severely malnourished (<60%).

Based on Waterlow's classification for Weight for height (wasting), less than half (46.1%) of children age under 59 months were normal (>90%). While, 40.9%of children were mildly malnourished (80-89%), 10.4% of children were moderately malnourished (70-79 %) and 2.6% of children were severely malnourished (<70%).

Based on Waterlow's classification for Height for age (Stunting), 52.2% of children age under 59 months were normal (>95%). While, 23.5% of children were mildly malnourished (90-94%), 14.8% of children were moderately malnourished (85-89 %) and 9.6% of children were severely malnourished (<85%).

ACKNOWLEDGEMENT

REFERENCES

Acharya, D., Gautam, S., Kaphle, H., & Neupane, N. (2013). Factors Associated with Nutritional Status of Under Five Children in Rupandehi District of Nepal. *Journal of Health and allied Sciences, 3*, 56-59. doi: 10.37107/jhas.56

Bhandari, T. R., & Chhetri, M. (2013). Nutritional status of under five year children and factors associated in Kapilvastu District, Nepal. *J Nutri on Health Food Sci, 1*(1), 2-6.

Bhusal, C. K., Bhattarai, S., Chhetri, P., & Myia, S. D. (2023). Nutritional status and its associated factors among under five years Muslim children of Kapilvastu district, Nepal. *PLoS One, 18*(1), e0280375. doi: 10.1371/journal.pone.0280375

Chataut, J., Jonchhe, S., & Ghimire, M. (2020). Prevalence and Associated Factors of Malnutrition in Under Five Children in a Rural Mountainous Area of Nepal: A Community Based Cross Sectional Study. *Kathmandu University medical journal (KUMJ), 18*(72), 407-413.

Chataut, J., & Khanal, K. (2016). Assessment of Nutritional Status of Children Under Five years of age in rural Nepal. *Kathmandu University medical journal (KUMJ), 14*(53), 73-77.

Dhungana, G. (2014). Nutritional Status Of Under 5 Children And Associated Factors Of Kunchha Village Development Committee. *Journal of Chitwan Medical College, 3*. doi: 10.3126/jcmc.v3i4.9553

DOHS (Producer). (2078/79(21/22)). http://dohs.gov.np/annual-report-2078-79/. *http://dohs.gov.np*.

Paudel, R., Gurung, Y. B., Poudyal, A. K., Khatri, B., Bhatta, D. R., Acharya, D., . . . Upadhyaya, D. P. (2020). Socio-demographic and Healthcare-seeking Predictors of Undernutrition among Children Under-five Years of Age in a Western District of Nepal. *J Nepal Health Res Counc, 18*(3), 488-494. doi: 10.33314/jnhrc.v18i3.2875

WHO (Producer). (2023a, sep 20). https://www.who.int/health-topics/nutrition. *https://www.who.int*. Retrieved from https://www.who.int/health-topics/nutrition

WHO (Producer). (2023b, 09 22). https://www.who.int/news-room/fact-sheets/detail/malnutrition. *https://www.who.int*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/malnutrition