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Nutritional Status of under 5-year Children in selected Community of Sindhupalchowk

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Abstract

In Nepal, malnutrition emerged as a public health concern. Children's nutritional status is one of the main indicators of their survival and can be used as a key indicator to track their health. The purpose of the study was to evaluate the nutritional status of children under the age of five. A quantitative, descriptive, cross-sectional study design was carried out from 2080/7/19 to 2080/8/24 to determine the prevalence of nutritional status of Under 5 children. Total number of children (N) was 102 between 12 months to 59 months of age group. Non-probability, total enumerative sampling technique was used to determine the samples in the study. The prevalence of malnutrition was assessed by three standard anthropometric indicators: underweight, stunting and wasting, following WHO guidelines and cut-off points. The Statistical Package for Social Science (SPSS), version 20, was used for data analysis. Data analysis was done using descriptive statistics. Most of the respondents 85(83.3%) were Mild Underweight, almost three- fourth respondents 88(86%) were mild stunting, 3(3%) were moderate stunting, more than four-fifth 92(92%) were mild wasting, 3(3%) were obese. There was increase prevalence of moderate stunting, mild wasting, and mild underweight. Periodic assessment of growth and development, awareness regarding food preparation and feeding practices among parents of Under 5 year children, monitoring and supervision is essential to prevent malnutrition in sustainable way

Keywords: Nutritional status, Under-5 children, Community

Introduction

Among children and adolescents aged 5–19 years, 390 million were overweight, including 160 million living with obesity, while 190 million experienced thinness (BMI-for-age >2 SD below median; World Health Organization [WHO], 2024). In 2022, 149 million children under 5 years suffered stunting, and 37 million had overweight or obesity (Global Nutrition Report, 2022). Nearly half of under-5 deaths are linked to undernutrition, predominantly in low- and middle-income countries. In Nepal, malnutrition contributes significantly to under-5 morbidity and mortality. Despite being "on track" for stunting reduction (31.5% prevalence vs. Asia's 21.8%), wasting affects 12.0% (vs. Asia's 8.9%), and overweight is rising at 2.6% (Global Nutrition Report, 2022). Nepal Micronutrient Status Survey reports 47% underweight, 54% stunted, and 7% wasted among under-5s; Nepal Demographic and Health Survey (NDHS, 2001) indicates 48% underweight, 50% stunted, and 10% wasted, with lower stunting but higher wasting in Terai vs. mountains. Poverty exacerbates malnutrition risks, increasing healthcare costs,

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reducing productivity, and perpetuating poverty cycles. This study aimed to assess nutritional status among under-5 children in rural Bahrabise Municipality to inform interventions.

Materials and Methods

A quantitative, descriptive, cross-sectional study was conducted from October 5 to November 10, 2023 (2080/7/19 to 2080/8/24 in Bikram Sambat calendar) among under-5 children (12–59 months) in Bahrabise Municipality, Sindhupalchowk District (one of 12 municipalities; Namaste Sindhupalchok, 2022). Bahrabise-3 had 102 eligible children (Population Registration File, 2079/2080). Sample size used Yamane's formula for finite populations; all 102 were included via convenience sampling.

Data collection used a structured questionnaire for socio-demographics and anthropometrics (weight, height). Weight was measured barefoot in minimal clothing using a digital scale (CITIZEN HMS324 WH, 0.1 kg precision), standardized daily. Height used a flexible tape against a wall (heels, buttocks, shoulders, occiput aligned; cm precision), averaged from duplicates. BMI-for-age, height-for-age (HFA), weight-for-age (WFA), and weight-for-height (WFH) Z-scores were calculated via WHO Anthro software (Version 3.2.2; WHO, 2011), referencing WHO growth standards (WHO, 2006, 2007). Malnutrition cutoffs: severe ($Z < -3$), moderate (-3 to -2), mild/normal (-2 to $-1/\pm 1-2$; WHO, 2007). Tools were pretested for reliability. Ethical approval and informed consent were obtained; data entered in Excel, analyzed in SPSS 20 with descriptive statistics (means, percentages).

Results

Table 1
Socio-Demographic Characteristics of Respondents (N = 102)

Characteristic	Category	Frequency (n)	Percentage (%)
Age (years)	1–3	69	67.6
	4–5	33	32.4
Mean = 1.32, SD = 0.47			
Sex	Male	49	48.0
	Female	53	52.0
Ethnicity	Brahmin	66	64.7
	Janjati	32	31.4
	Dalit	4	3.9
	Madheshi	0	0.0
Religion	Hinduism	88	86.1
	Buddhism	9	8.8
	Christian	5	4.9
Family Type	Nuclear	49	48.0
	Joint	36	35.3
	Extended	17	16.7
Education of Family Head	Illiterate	1	1.0
	Primary	12	11.8
	Middle	37	36.3

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Characteristic	Category	Frequency (n)	Percentage (%)
	High school	30	29.4
	Intermediate/Diploma	8	7.8
	Graduate	10	9.8
	Professional	4	3.9
Occupation of Family Head	Unemployed	9	8.8
	Unskilled	14	13.7
	Semi-skilled	13	12.7
	Clerical/Shop/Farm	36	35.3
	Skilled	21	20.6
	Semi-professional	8	7.8
	Professional	1	1.0
Monthly Income (NPR)	<4,850	4	3.9
	4,851–14,550	4	3.9
	14,551–24,350	23	22.5
	24,351–36,550	19	18.6
	36,551–48,750	11	10.8
	48,751–97,450	40	39.2
	>97,451	1	1.0

Table1showed that more than half of children 69(67.6%) were from age group (1-3 years) and majority (52%) were female. Majority of respondents (82.1%) belonged to Hindu religion. One third of respondents (32.1%) were from joint family and more than half of respondents (64.7%) belonged to Brahmin ethnicity. 37(36.4%) respondents had Middle School education, 30(29.4%) respondents obtained High School education, 12(11.8%) respondents had achieved Primary School,10(9.8%) respondents were Graduates,8(7.8%) respondent were Intermediate/diploma,4(3.8%) respondent were Professional Degree and 1(1%) respondent were Illiterate. On the basis of occupation it was found that 36(35.3%) respondents were engaged in Clerical shop- owner/farm, 21(20.7%) respondents were skilled worker, 14 (13.8%) respondents were unskilled worker, 13(12.7%) respondents Semi-Skilled Worker, 9(8.8%) respondent were unemployed, 8(7.8%) respondents were Semi- professional and only 1(0.9%) respondent was Professional (white collar). On the basis of income, it was found that 40(39.2%) respondent income were Rs. 48751-97450 per month, 23(22.5%) respondent income were Rs. 14551-24350 per month, 19(18.6%) respondent income were Rs. 24351-36550 per month, 11(10.8%) income was Rs. 36551-48750 per month,4(3.9%) respondent income was. Rs.4851-14550 per month, 4(3.9%) respondent income was Rs.<4850 per month and only one 1% respondent income was Rs.>97451 per month.

Table 2
Socio-Economic Class of Respondents N = 102

Socio-Economic Class	Frequency (n)	Percent (%)
Upper	1	1.0
Upper Middle	22	21.6
Lower Middle	51	50.0
Upper Lower	28	27.4

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Table 3
Feeding Types and Patterns (N = 102)

Variable	Category	Frequency (n)	Percentage (%)
Junk Food	Yes	58	56.9
	No	44	43.1
Traditional Food	Yes	48	47.1
	No	54	52.9
Feeding Frequency	2–3 times	16	15.7
	4–5 times	44	43.1
	>5 times	42	41.2
Food Types	Super Flour	11	10.8
	Jaulo	19	18.6
	Dal-Bhat-Tarkari	72	70.6
Breastfeeding	Yes	50	49.0
	No	52	51.0

Junk food was common (56.9%); traditional foods less so (47.1%); dal-bhat-tarkari predominant (70.6%).

Table 4
Nutritional Status by Weight-for-Age (WFA; N = 102)

Category	Z-Score	Frequency (n)	Percent (%)
Severe Underweight	< –3.0	0	0.0
Moderate Underweight	–3.0 to –2.01	0	0.0
Mild Underweight	–2.0 to –1.01	85	83.3
Normal	±1.0	17	16.7

Table 5

Nutritional Status by Height-for-Age (HFA; N = 102)

Category	Z-Score	Frequency (n)	Percent (%)
Severe Stunting	< –3.0	0	0.0
Moderate Stunting	–3.0 to –2.01	3	2.9
Mild Stunting	–2.0 to –1.01	88	86.3
Normal	±1.0	11	10.8

ISSN: 2961-1989
Academia Research Journal (ARJ)
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Volume: 5 Issue: 1 Year: 2026

Table 5
Nutritional Status by Weight-for-Height (WFH; N = 102)

Category	Z-Score	Frequency (n)	Percent (%)
Severe Wasting	< –3.0	0	0.0
Moderate Wasting	–3.0 to –2.01	0	0.0
Mild Wasting	–2.0 to –1.01	94	92.2
Normal	±1.0 to +2.0	5	4.9
Overweight	+2.01 to +3.0	3	2.9
Obesity	≥ +3.0	0	0.0

Discussion

This study concludes that mild forms of underweight (83.3%), stunting (86.3%), and wasting (92.2%) predominate among under-5 children in rural Bahrabise Municipality, Sindhupalchowk District, indicating a pattern of widespread but predominantly mild chronic malnutrition in the absence of severe cases.

These results contribute to the broader question posed in the introduction regarding whether rural communities in Nepal are sustaining national progress against childhood undernutrition or whether persistent mild deficits continue to undermine gains in stunting reduction and wasting control. The high prevalence of mild forms across all three anthropometric indicators suggests that, despite national-level improvements, pockets of chronic mild malnutrition persist in rural hill settings, driven primarily by suboptimal feeding practices and socio-economic constraints. The finding of a very high rate of mild underweight (83.3%) contrasts sharply with community-based studies reporting lower underweight prevalence. For example, Bhusal et al. (2023) found that nearly half of under-5 Muslim children in Kapilvastu district were underweight and the majority was stunted, while Goyal et al. (2023) reported only 24.5% underweight among urban children in South Delhi. These differences are likely attributable to variations in feeding habits, cultural child-rearing practices, and the quality of breastfeeding and complementary feeding (Geberselassie et al., 2018).

The observed high prevalence of mild stunting (86.3%) aligns closely with several previous investigations in resource-limited settings. Khan et al. (2019) reported stunting as the most common nutritional abnormality among children aged 1–5 years in Pakistan, followed by underweight (29.4%) and wasting (10.7%). Similarly, a large rural study in Nepal found that the majority of children were stunted, followed by underweight and wasting (Karkuki Osguei & Mascie-Taylor, 2019). However, the present results contrast with Acharya et al. (2023), who documented much lower stunting rates among children attending a tertiary care center in Nepal. Multiple studies have consistently linked stunting to child age, occupational status of the family head, family size, and parental education (Geberselassie et al., 2018). In the Nepalese context, additional contributing factors likely include inappropriate feeding and rearing practices, parental illiteracy, neglected childcare, prevalent food-related myths, and improper cooking methods.

In contrast, the exceptionally high rate of mild wasting (92.2%) in this study differs markedly from other reports. Goyal et al. (2023) found only 17.8% wasting (including 29.1% severe) in urban South Delhi, while Getu et al. (2023) reported wasting as rare among children aged 6–59 months in Debre

ISSN: 2961-1989
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Volume: 5 Issue: 1 Year: 2026

Tabor town, Ethiopia. The elevated mild wasting observed here may be associated with inadequate maternal prenatal care, lack of exclusive breastfeeding, low household income, and large family size, and concurrent childhood illness, factors repeatedly identified as key determinants of wasting (Kassaw et al., 2024). Additional influences such as handwashing practices, the prevalence of diarrheal disease, and caregivers' educational level are also likely to affect nutritional outcomes in this setting (Yeshaneh et al., 2022). The primary limitations of this study, small convenience sample (N = 102), cross-sectional design precluding causal inference, and restriction to a single rural ward, limit the generalizability of findings and prevent confirmation or validation of specific causal pathways (e.g., the precise mechanisms linking poverty to malnutrition). These constraints leave important national questions partially unanswered, particularly how targeted interventions can sustainably interrupt the poverty, malnutrition cycle across diverse geographic and cultural contexts in Nepal.

Future extensions, including longitudinal multi-site studies comparing Terai, hill, and mountain regions, advanced factor modeling incorporating dietary recalls and maternal care variables, and community-based intervention trials (e.g., promotion of locally fortified complementary foods), would help clarify underlying drivers, validate trends against national surveys (WHO, NDHS), and provide evidence to guide scalable, context-specific poverty-nutrition programs.

Conclusion

The prevalence of mild underweight, mild stunting and mild wasting was high. It is crucial to monitor growth and development of child and provide awareness regarding malnutrition among parents of under - 5 year children to prevent from complications associated with malnutrition. Health education regarding diet, food preparation and importance of breast feeding practices is essential among parents of Under 5 children.

Recommendations

This simple analysis might be useful as a first step in developing hypotheses and for stakeholders to review trends. It also allows for "assumptions" to play a larger role in identifying drivers. Routine monitoring of growth and development and early identification from deviations could be done. However there are various factors associated with malnutrition that needs to be addressed to prevent from malnutrition in sustainable way. As malnutrition is also related to cycle of poverty, program of poverty reduction should be launched by proper identification of target groups. The education and awareness should be promoted by literary classes. Awareness campaign should be launched about good feeding habits, appropriated weaning practices emphasized on locally available foods, food storage, and preservation.

Limitations

This study is limited by its small sample size (N = 102) obtained through convenience sampling in a single rural ward, which restricts generalizability to other regions of Nepal. The cross-sectional design prevents establishment of causality or temporal relationships. Lack of detailed data on key confounders (e.g., childhood illness, food insecurity, maternal knowledge) hinders full explanation of the observed high mild malnutrition. These constraints leave important national questions about the mechanisms and sustainable interruption of the poverty–malnutrition cycle only partially addressed.

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