

## Nutritional Status of Under Five Years Children in Bharatpur, Chitwan

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### Abstract:

**Background:** Nutrition status is still a problem among under-five children. Malnutrition is a major public health problem in most of the developing countries including Nepal and occurs prominently among under-five children. Assessment of nutritional status is the key factors to rule out the malnutrition among children. The objective of the study was to find out the nutritional status of under five years children in a selected ward of Bharatpur metropolitan, Chitwan.

**Materials and Methods:** A community based descriptive cross-sectional study design was adopted and conducted from 20/6/2018 to 4/7/2018 among 167 under five years children. Convenience sampling technique was used to select the sample and Semi-structured interview schedule as well as anthropometric measurement were used to collect the data. Children were weighed and measured as per the WHO (World Health Organization) guidelines on Anthropometry. WHO criteria was used to compare with calculated z-score by using WHO AnthroV3.2.2 software and classified accordingly. Data analysis was done by using Statistical package for social science (SPSS) version 20.

**Results:** The study finding revealed that, out of 167 children 18.6% were stunted, 9% were wasted, 12.57% were underweight and 5.39% were overweight. Underweight was statistically associated with types of family ( $p=0.024$ ) gender of child, ( $p=0.004$ ), and age of the mothers ( $p=0.001$ ).

**Conclusion:** Stunting was more prevalent than wasting and underweight in the study which indicates that there is a problem of chronic malnutrition. Nutrition status of child is significantly associated with types of family, gender of child, and age of mothers. This finding has important role as this demand potentials action that can be used to improve the nutritional status of under five years children.

**Keywords:** Nutrition status, Under five years children, Mothers

Date of Submission: 28-06-2021

Date of acceptance: 12-07-2021

### I. Introduction

Nutritional status of children is one of the major predictors of child survival. However, malnutrition is a major public health problem in most of the developing countries around the world and occurs evidently among children age less than five years<sup>1</sup>.

Proper nutrition in childhood is considered to play a pivotal role in the physical, mental, and emotional development of children through to their later adult life. Children are therefore considered the priority population for intervention strategies. Nutritional assessment in children is needed to determine their nutritional status and problems in their food regimes and if identified, to treat such problems in order to prevent them from becoming larger and threatening to children's health<sup>2</sup>.

Malnutrition is a major contributor to the global disease burdens; more than one third of children are under-nourished<sup>3</sup>. Poor nutrition among children is the primary health problem in developing countries. The major nutritional problem facing the developing countries is protein energy malnutrition<sup>4</sup>.

A key indicator of chronic malnutrition is stunting when children are too short for their age group compare to the child's growth standards. About 178 million children globally are stunted resulting from not getting enough food, vitamin and mineral resulting poor diet and diseases. Stunting rate among children are highest in Africa and Asia, Wasting is the severe form of malnutrition resulting from acute food storage and compounded by illness<sup>3</sup>.

Malnutrition contributes to more than one-third of all deaths of under-five children. Moreover, 195 million under-five children are affected by malnutrition; 90% of them live in Sub Saharan Africa and South Asia. At least 20 million children suffer from severe acute malnutrition (SAM), and another 175 million are undernourished<sup>5,6</sup>.

The high rate of child under-nutrition in Nepal remains a major problem despite a steady decline in recent years. Trends of nutritional status of children under five years from 2001 to 2016 are: Stunting 57% to 36%, wasting 11% to 10%, and underweight 43% to 27% respectively<sup>7</sup>. Although different forms of malnutrition is in decreasing trend there is no satisfactory result is found and prevalence of wasting is found stagnant. So the aim of this study was to find out the nutritional status of under five children.

## **II. Methods and Materials**

Descriptive cross sectional study design was adopted to find out the nutritional status of under five years children aged 6 month to 59 months residing in Bharatpur Metropolitan 7, Chitwan.

**Study Design:** Descriptive cross sectional study design

**Study Location:** Bharatpur Metropolitan 7, Chitwan

**Study Duration:** Data was collected within two weeks period, from 20/6/2018 to 4/7/2018.

**Sample Size:** 167 Under five years children

**Sample size calculation:** Sampling size was calculated by using following formula

$$n_0 = \frac{Z_{\alpha/2}^2 pq}{d^2}$$

Where,

Z = confidence interval set at 95% which is 1.96

p = 0.5 (considering Prevalance 50%)

q = 1-p, hence q = 0.5

d = permissible error set at +/- 7% or 0.07

n = desired sample size

Hence substituting the formula

$$n_0 = \frac{Z_{\alpha/2}^2 pq}{d^2}$$

$$= (1.96)^2 \times (0.5) \times (0.5) / (0.0049)^2$$

$$= 196$$

For finite population, where N = Total Under five years population *i.e.* 1135 (as per report Bharatpur Metropolitan City, Chitwan)

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

$$= \frac{196}{1 + \frac{196 - 1}{1135}}$$

$$= 167$$

Therefore, the desired sample size (n) was 167

**Subjects & Selection Method:** Non probability, convenience sampling technique was used to collect the data of under five year children. Under five years household was identified with the help of Female Community Health Volunteer (FCHV) if there was more than one under five children in one household youngest child was selected for the study.

### **Inclusion Criteria:**

1. All those children aged between 6 to 59 months residing at Bharatpur Metropolitan-7, Chitwan during the period of data collection.
2. Children who were available during the period of data collection and whose mother gave consent to participate in the study were included in the study.

**Exclusion Criteria:** Children having any chronic illness and physical disabilities like: congenital heart disease, cerebral palsy were excluded from the study.

### **Procedure Methodology:**

After getting ethical approval from Institutional Review Committee of Chitwan Medical College (CMC-IRC). Data collection permission was obtained from ward office of Bharatpur Metropolitan 7. For data collection self-constructed semi-structured interview schedule along with a valid electronic weighing machine and measuring tape were used for anthropometric measurement. Data collection tool consisted of three parts Part I related to socio-demographic information of mother and child, Part II related to feeding practice of child and Part III for the record of information related to Anthropometric measurement of child. Before data collection informed consent was obtained from each mother of under five years children. Face to face interview was taken from the mother. During the study, every precaution was taken to safeguard the rights and welfare of every respondent. Data was collected by researchers themselves within two weeks period.

Anthropometric measurement i.e. length/height and weight of under five years children was measured as per WHO guideline: For measuring height, child was made to stand bare foot on a floor against the wall with feet parallel and joined together, with heels and buttock touching the wall. It was made sure that there was no cap/hat on head, head is held erect and hands were hung closely at the sides. The height was marked on the wall with a chalk and then it was measured by a measuring tape. Length of children below the 24 months was taken in supine position placing the child on a paper-covered surface, marking the end points of the top of the head and the heels of the feet toes pointing directly to the ceiling, and measuring the two points. Length/height was recorded to the nearest 0.1 cm. For measuring weight, electronic scale was placed on a flat, level surface checked and readjusted the weight reading to zero before using it then undressed the child, made him/her stand freely without holding onto anything on the middle of the scale's surface. When the child is settled and the weight reading is stable recorded the weight to the nearest 100g. For those child below 24 months and who were unable to stand, asked the mother to stand on the scale's surface in the middle and record her weight to the nearest 100g when she is settled and the weight reading is stable, handed child to her. When the mother is settled with the child and the weight reading is stable record the weight to the nearest 100g. Weight of child was obtained by subtracting the recorded weight of the mother alone from the recorded weight of the mother and child.

**Statistical analysis:**

Collected data was entered and analyzed by IBM- Statistical Package for Social Sciences (IBM-SPSS) version 20 using descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (chi-square test) according to the nature of the data. WHO AnthroV3.2.2 software was used to calculate the Z-scores and WHO criteria was adapted to compare with calculated z-score and classified accordingly<sup>7</sup>. Children whose length/height for age Z-score (HAZ) is below minus two standard deviation (-2SD) from the median of reference population are considered as Stunted. Children whose weight for height/length Z-score (WHZ) is below minus two standard deviation (-2SD) from the median of reference population are considered as Wasted. Children whose weight for height/length Z-score (WHZ) is more than two standard deviation (+2SD) above the median of reference population are considered as overweight. Children whose weight for age Z-score (WAZ) is below minus two standard deviation (-2SD) from the median of reference population are considered as underweight.

**III. Results**

Table no. 1 shows socio-demographic characteristics of child, 29.9% of children were 36-47 month with mean age was 34.46 (±16.23) years and more than half (57.5%) of the children were male. Majority (68.3%) of children were born at terms, 73.7% children's birth weight were ≥ 2500gram. More than half (54.5%) had < 2 siblings, 59.9% children were born as first child and 26.9% children had serious illness 2 weeks preceding the survey (Table 1).

**Tableno. 1: Socio Demographic Characteristics of Child**

Variables	Frequency	Percentage
n=167		
<b>Age of child (in month)</b>		
6 -11	21	12.6
12-23	23	13.8
24-35	25	15
36-47	50	29.9
48-59	48	28.7
Mean ± SD = 34.46 ± 16.23		
<b>Gender of child</b>		
Male	96	57.5
Female	71	42.5
<b>Gestational age of the child at birth</b>		
Pre -term	20	12.0
Term	113	68.3
Post term	34	19.7

Weight of child at birth (in gram)		
>2500gm	44	26.3
≤2500gm	123	73.7
Number of siblings		
<2	91	54.5
≥2	76	45.5
Birth order of child		
First	100	59.9
Second	63	37.7
Third	4	2.4
Child having serious illness during the past 2 weeks		
Yes	45	26.9
No	122	73.1

Table no. 2 shows socio-demographic characteristics of mother, 73% of the mothers belonged to the age group of 21-30 years. Majority (87.4%) of mothers follow Hinduism religion, 53.3% of mothers belong to nuclear family similarly 53.3% mothers belong to ≤ 4 members family size. All (100%) were literate and 50.9% of them were home makers. Concerning marital status, 94.6% mothers were married and all (100%) mothers got information regarding nutrition for under 5 children and 95.2% family's monthly income is sufficient for a month.

**Table no. 2 :Socio-demographic Characteristics of Mother**

n=167		
Variables	Frequency	Percentage
Age of mothers (in year)		
≤20	5	3.0
21-30	121	72.5
31-40	41	24.5
Median age =28(IQR =30-25)Max 35, mini=18		
Religious status		
Hinduism	146	87.4
Buddhism	16	9.6
Christianity	5	3.0
Type of family		
Nuclear	89	53.3
Joint	78	46.7
Family size		
≤4	89	53.3
>4	78	46.7
Mother's level of education		
General literate	21	12.6
Basic literate	29	17.4
Secondary level	67	40.1
Bachelor level and above	50	29.9
Occupation of mother		
Agriculture	16	9.6
Services	43	25.7
Business	17	10.2
Labor	11	6.3
Homemakers	80	48.2
Marital status		
Married	157	94.6
Widowed/ Divorced	10	5.4
Sufficiency of monthly family income		
Yes	159	95.2
No	8	4.8

Table no. 3 depicts information regarding feeding practices of child. Nearly half (47.9%) of mothers initiated breast feeding within 1 hour after birth and 89.2% mother had exclusive breast feeding practice similarly 75.4% of the mothers started complementary food ≥ 6 months, 91.6% of mother provided homemade snacks in afternoon. Most of the (97%) mothers had provided seasonal fruit among them, 48.1% mothers provided daily. Majority (96.4 %) of mother had no food taboos, 77.2% of mothers had kitchen garden in their home. Majority (85% ) and 87.4% children received the antihelmintic drugs and vitamin A respectively.

**Table no. 3: Information Regarding Feeding Practice of Child**

n=167		
Variables	Frequency	Percentage
<b>Initiation of breast feeding after birth</b>		
Within 1 hour	80	47.9
More than 1 hour	87	52.1
<b>Exclusive breastfeeding practices</b>		
Yes	149	89.2
No	18	10.8
<b>Age of complementary food started</b>		
< 6 Month	41	24.6
≥ 6month	126	75.4
<b>Snack provided to the child in afternoon</b>		
Homemade	153	91.6
Commercial food	14	8.4
<b>Provide seasonal fruits to the children</b>		
Yes	162	97.0
No	5	3.0
<b>If yes, frequency of giving seasonal fruits( n=162)</b>		
Daily	78	48.1
Every alternate day	52	32.1
Every 3-4 days	30	18.5
Every 5-7 day	2	1.3
<b>Food taboo in the cultures</b>		
Yes	6	3.6
No	161	96.4
<b>Kitchen garden</b>		
Yes	129	77.2
No	38	22.8
<b>ReceivedAntihelminitic drugs</b>		
Yes	142	85
No	25	15
<b>Received Vitamin A</b>		
Yes	146	87.4
No	21	12.6

Table no. 4 reveals nutritional status of under five year children, 18.6% were stunted, 9% were wasted, 5.38% were overweight and 12.57% were underweight.

**Table no.4:Nutritional Status of Under Five Years Children**

n=167		
Variables	Frequency	Percentage
<b>Height for age (HAZ)</b>		
Normal	136	81.4
Stunted	31	18.6
<b>Weight for length/height (WHZ)</b>		
Normal	143	85.62
Wasted	15	9
Overweight	9	5.38
<b>Weight for Age (WAZ)</b>		
Normal	146	87.43
Underweight	21	12.57

Table no. 5 indicates that there was significant association between nutritional status according to weight for age (WAZ) and gender of child (p=0.004), age of mother (p=0.001) and type of family (p=0.024). But there was no any significant association found between nutritional status according to weight for height (WHZ) and Height for age (HAZ) with socio-demographic variables (not shown in table).

**Table no. 5: Association of Weight for Age (WAZ) and Socio-demographic Variables**

Variables	Weight for age		$\chi^2$	P value
	Normal No. (%)	Underweight No. (%)		
<b>Gender of child</b>				
Male	90(93.8)	6(6.2)	8.217	0.004
Female	56(78.9)	15(21.1)		

<b>Age of mothers</b>				
≤28 years	70(79.5)	18(20.5)	10.506	0.001
> 28 years	76(96.2)	3(3.8)		
<b>Type of family</b>				
Nuclear	73(82.)	16(18.)	5.059	0.024
Joint	73(93.6)	5(6.4)		

*p-value significant at <0.05*

#### IV. Discussion

The study findings revealed that prevalence of stunting among under five years children is 18.6% which is supported by the study conducted in Kunchha village development<sup>8</sup>, in rural area of Thrissur district, Kerala India<sup>9</sup> and in Akure South Local Government, Ondo State, Nigeria<sup>10</sup> which revealed that 17%, 14% and 12.5% were stunted respectively. Whereas result of this study conducted in Dolakha and Kavre districts of Nepal showed higher i.e. 39.9% children were stunted<sup>1</sup>. The finding observed in our study is lower than the reports of Nepal Demographic Health Survey (NDHS) 2016 which revealed that 36% children were stunted<sup>7</sup> and also lower than the studies conducted in Nairobi, Kenya<sup>11</sup>, Nghean, Vietnam<sup>12</sup> and in Bangladesh<sup>13</sup> which showed that 47%, 44.3% and 44.9% children were stunted respectively. The differences in the findings might be due to limited sample size, setting and timing of the study conducted.

In this study, the prevalence of wasting among under five years children is 9% children were wasted which is supported by the studies conducted in different part of Nepal, Lamjung, Gorkha and Tanahun districts<sup>14</sup> which revealed that 10.6% were wasted, Dolakha and Kavre districts<sup>1</sup> 7% were wasted. Similar prevalence is found in the report of NDHS 2016 which showed that 10% were wasted<sup>7</sup>. Similarly studies conducted in Tehsil Zarghoon Town, District Quetta, Baluchistan<sup>15</sup>, Akure South Local Government, Ondo State, Nigeria<sup>10</sup>, Nghean, Vietnam<sup>12</sup> and in Bangladesh<sup>13</sup> revealed that 9.7%, 14.8%, 11.9%, and 10.5% children were wasted respectively. In contrast study conducted in Nairobi, Kenya<sup>11</sup> showed that only 2.6% were wasted.

Findings of current study showed that prevalence of underweight is 12.57%, this is consistent with the finding of the studies conducted in Akure South Local Government, Ondo State, Nigeria<sup>10</sup>, Nairobi, Kenya<sup>11</sup> which revealed that prevalence of underweight was 8.5% and 11.8% respectively. Whereas higher prevalence is observed in the studies conducted in attending early childhood development center, Pokhara which revealed that 16% were underweight<sup>16</sup> and report of NDHS 2016 which showed that 27% were underweight<sup>7</sup>. Higher findings of underweight is observed in the studies conducted in rural area of Thrissur district, Kerala India<sup>9</sup>, in Nghean, Vietnam<sup>12</sup> and in Bangladesh<sup>13</sup> which showed that 28.3%, 31.8% and 48% were underweight respectively. The study finding might be varied due to characteristics of child, parent's awareness, limited sample size and setting.

Findings of current study showed that prevalence of overweight is 5.38% which is higher than the finding observed in report of NDHS 2016 which showed that 1% were overweight<sup>7</sup>.

There was no any significant association found in stunted and wasted with socio-demographic variables but significant association can be observed in underweight with gender of child ( $p=0.004$ ), age of mother ( $p=0.001$ ) and type of family ( $p=0.024$ ). This is supported by the study conducted in Chitwan district of Nepal<sup>17</sup> which showed that Female child were found more vulnerable for malnutrition, Kapilvastu district of Nepal<sup>18</sup> which showed that there are significant association between weight for age and age of mother. Similarly, the significant association was found between weight for age and family size which is supported by the study conducted in Lamjung, Gorkha and Tanahun districts<sup>14</sup> as well as in Chitwan district<sup>17</sup>. Type of family and size of family matters for the nutritional status of children.

#### V. Conclusion

The present study concludes that most of children are well nourished while considerable percentage are stunted, underweight and wasted. The overall prevalence of stunting is higher as compare to wasting and underweight. Gender of child, types of family, age of mother are associated with underweight. Though association of malnutrition was found with non-modifiable variables there may be some hidden causes behind that. So these findings are of great importance because they demand potential actions such as awareness programs to the mothers, continuous nutritional assessment and periodically monitoring training to the school teachers can be used to improve the nutritional status of under five children. Relevant policies, effective programs and a wide variety of activities must be formulated and carried out with efforts to tackle malnutrition in under five year children of Nepal.

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