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Dipesh Khanal, Kabindra Bhattarai

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Dipesh Khanal[1]; Kabindra Bhattarai[1]
[1]Department of Nutrition and Dietetics, Tribhuvan University, Nepal

Background: Mothers play a crucial role in the early stages of child development, particularly in ensuring proper nutrition and care. Their knowledge and practices, including breastfeeding, nutrition, and overall childcare, significantly influence a child's health outcomes. The Musahar community in the Terai region of Nepal is one of the most marginalized and impoverished groups in the country. They face extreme social and economic challenges, with limited access to education, healthcare, and employment opportunities, often living in severe poverty and social exclusion. This study examines the association between mother's knowledge and malnutrition. **Method:** A community-based cross-sectional study was conducted in Musahar community of Ratuwamai Municipality, Morang with 116 children using census sampling. The World Health Organization growth standards height-for-age Z-scores (HAZ), weight-for-height Z-scores (WHZ) and weight-for-age Z-scores (WAZ) were used to measure stunting, wasting and underweight. Data were collected via pretested, semi-structured questionnaires covering socio-economic and demographic factors, child characteristics, childcare practices, maternal characteristics, maternal knowledge on breastfeeding and childcare practices. Data were analyzed using Statistical Package for the Social Sciences (SPSS) and WHO Anthro with Chi-square for significant associations. **Results:** The prevalence of wasting, underweight and stunting was 24.1%, 33.6% and 29.3% respectively. Wasting and underweight was found to be higher in male children whereas stunting was higher in female children. Wasting was highest in the age group between 12-23 months, stunting was highest in the age group between 36-47 months while underweight was highest in the age group 24-35 months. In this study, nearly half of the mothers (49.1%) had poor knowledge, while 43.1% had average knowledge, and only 7.8% demonstrated good knowledge regarding breastfeeding and childcare practices. Mother's knowledge score was significantly associated with stunting ($p=0.004$) and underweight ($p=0.014$) but not with wasting. **Conclusion:** Malnutrition remains a significant issue among Musahar children aged 6-59 months in Ratuwamai Municipality, Morang. To combat this, targeted programs focusing on both child and maternal health are essential for improving nutritional outcomes and reducing child malnutrition in this community.
Keywords: Malnutrition, stunting, wasting, underweight

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Introduction: Childhood is a crucial period of life for humans, both physiologically and psychologically, marked by maximal growth, skeletal enlargement, and remodeling of body composition. During this phase, nutrition is essential for maintaining an appropriate growth characteristic, building immunity against infectious diseases, and ensuring good health in later life all depend on getting an adequate and balanced quantity of energy and nutrients (Langley-Evans, 2021). Inadequate food consumption causes malnutrition, which occurs as underweight, wasting, and stunting with symptoms such decreased immunity, growth failure, and weight loss (WHO, 2005). The growth and development of children are greatly influenced by the mothers' feeding habits and understanding of nutrition. Even in households with sufficient income, food, hygienic conditions, and health care, children may have poor nutritional status if proper nutrition knowledge and feeding techniques are lacking (Jemide *et al.*, 2016a). Currently, undernutrition and overweight are two forms of malnutrition that burden the world. According to WHO report, only 41% of newborns under 6 months are exclusively breastfed, 40 million children under 5 years are overweight, 149 million children under 5 are stunted, 49 million are wasted, and 15% of babies are born with low birth weight globally (WHO, 2019). Underweight affects 462 million people worldwide, with a 27.4% prevalence in South Asian children under five. Around 70-80% of undernourished children worldwide live in lower and middle-income countries, including Nepal. Malnutrition is a contributing factor in half of the deaths of children under five (54 per 1000 live births)(Shrestha *et al.*, 2023). According to NDHS 2022, 25% of children under 5years of age are stunted, 8% are wasted, 19% are underweight, and 1% are overweight (MoHP, 2022).

The Dalit group includes the Musahar community. Musahar community suffers from the extreme nutritional problem. Their nutrition status directly affects the health status of the country. The factors behind the poor nutritional status need to be identified to support the community to improve their nutritional status. Musahar community is one of the oldest communities in Nepal (Shah *et al.*, 2016).Their economic state is still poor making it difficult for them to access facilities for health care and food intake. They are not very conscious of eating habits and nutrition because most of them lack literacy and education. Their hygiene and sanitation behaviors are still to be improved so their children are more susceptible to the various communicable diseases and prone to be malnourished (Ojha, 2003).

Objectives of the study

- To determine the nutritional status of Musahar children aged 6-59 months in Ratuwamai Municipality.
- To assess the knowledge of mother on breastfeeding and childcare practices.
- To find out the association between mother’s knowledge and nutrition status of children.

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Methods

Research design: *A* community based cross-sectional survey was conducted in Musahar community of Ratuwamai Municipality, Morang to assess the mother's knowledge in breastfeeding and childcare practices and its association on malnutrition among children aged 6-59 months. Anthropometric measurement of children under five years of age was done and household survey was conducted with the help of questionnaires.

Sample and Sampling techniques: The study has adopted as census method. So, every household of Musahar children who are between 6 to 59 months of age were studied. The sample size is equal to the total number of children who lie in between age group of 6 months to 59 months and belongs to Musahar community of Ratuwamai Municipality.

Data collection and analysis: The data was collected with the help of structured questionnaire form, by face-to-face interview with mother of child. A well designed and pretested set of questionnaires was used for collecting household information and knowledge of childcare practices among mothers. Weight, length or height and mid-upper arm circumference (MUAC) were measured using standard anthropometric methods. The data obtained from final survey was checked for completeness and consistency. Anthropometric indices were calculated using reference medians recommended by the World Health Organization (WHO) and classified according to standard deviation units (Z scores), based on the WHO criteria. Both descriptive and inferential statistics were used for data analysis. Descriptive analysis was used to identify percentages and number of distributions of the respondents by the sociodemographic characteristics and other relevant variables in the study. Chi-square test was used to find out the association between nutritional status and maternal knowledge level.

Results

Socio economic and demographic characteristics: The majority of the households studied were nuclear families, with a smaller proportion being joint families. Fathers' occupations predominantly included labor, followed by foreign employment and agriculture. Most families had a lower annual income, with only a few earning higher amounts. Male-headed households were more common than female-headed ones. Fathers generally had low levels of education, with very few having completed primary or secondary education. The majority of the houses were made of concrete, with a smaller fraction being mud houses. Mothers played a more significant role in food purchasing than fathers as shown on Table 1.

Table 1 Socio-economic and demographic characteristics of study population

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Variables	Frequency	percent
Family Type		
Nuclear	70	60.3
Joint	46	39.7
Father's occupation		
Agriculture	8	6.9
Foreign	31	26.7
Labor	77	66.4
Annual Income		
< 1 lakh	80	69.0
1 lakh to 2 lakh	23	19.8
> 2 lakhs	13	11.2
Head of the Household		
Male	87	75.0
Female	29	25.0
Father's education		
Primary	14	12.1
Secondary	5	4.3
No education	97	83.6
House structure		
Concrete	103	88.8
Mud	13	11.2
Household Food Purchaser		
Father	47	40.5
Mother	69	59.5

Child Characteristics: Among116 children of age group 6-59 months, 47.4% were boys and 52.6% were girls. The children of age 6-59 months were categorized according to WHO standard into 5 groups and shows that the age group of 12-23 months were maximum occupying 25.9% of the whole sample from both of the age groups. A significant number of mothers were unaware of their children's birth weight, indicating a gap in prenatal and postnatal care awareness. As indicated, about 9.5 % of children were recently suffered during the survey period from various childhood illness such as common cold, fever, pneumonia and jaundice. In the study 13 mothers reported the death of their previous child before 5 years of age.

Table 2 Child characteristics of the study population

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Variables	Frequency	Percent
Gender		
Male	55	47.4
Female	61	52.6
Age Category		
6-11 months	20	17.2
12-23 months	30	25.9
24-35 months	21	18.1
36-47 months	19	16.4
48-59 months	26	22.4
Child order		
First	38	32.8
Second	33	28.4
Third	31	26.7
More	14	12.1
Birth Weight		
≥ 2.5 kg	51	43.9
< 2.5 kg	25	21.6
No idea	40	34.5
Death of child under five years		
Yes	13	11.2
No	103	88.8
Recent Disease		
Yes	11	9.5
No	105	90.5

Maternal characteristics: The study highlights several key findings about maternal health and education. A majority of mothers were illiterate, with only a smaller portion having primary or secondary education. Most mothers married and had their first pregnancy before the age of 20. The vast majority received vaccinations during pregnancy, and many took iron and folate supplements. Dietary intake during pregnancy varied, with some mothers increasing their food intake, others maintaining it, and some reducing it. Most mothers ate 3-4 times a day, while fewer ate less or more frequently.

Table 3 Maternal characteristics of survey population

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Variables	Frequency	Percent
Initiation of Breastfeeding		
Within 1 hour	79	75.0
Within 24 hours	31	19.8
After 24 hours	6	5.2
Colostrum feeding		
Yes	107	92.2
No	9	7.8
Exclusive breastfeeding		
Yes	71	61.2
No	45	38.8
Pre- lacteal feed		
Yes	21	18.1
No	95	81.9
Child vaccine		
Yes	109	94.0
No	7	6.0
Initiation of complementary food		
4-5 months	11	9.4
5-6 months	23	20.0
> 6 months	82	70.6

Mother's knowledge on breastfeeding practices: The survey highlights gaps in maternal knowledge about optimal breastfeeding practices. While a portion of mothers were aware of the need to start breastfeeding soon after birth, but a significant portion lacked knowledge about the timing. Awareness of the benefits of colostrum and exclusive breastfeeding for the first six months was limited. Most mothers believed in breastfeeding beyond two years, though some were uncertain or thought it should be shorter. While most mothers correctly identified pre-lacteal feeding as unnecessary, a notable minority still considered it essential.

Table 4 Mother's knowledge on breastfeeding practices

Variables	Frequency	Percent
Knowledge on initiation of breastfeeding		
Within 1 hour	57	49.1
Within 24 hours	37	31.9

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No idea	22	19.0
Knowledge on colostrum feeding		
Good for child health	44	38.0
No idea	72	62.0
Knowledge on exclusive breastfeeding		
Yes	52	44.8
No	64	55.2
Knowledge on duration of breastfeeding		
< 2 years	24	20.7
≥2 years	72	62.1
Don't know	20	17.2
Need of Pre lacteal Feed		
Yes	31	26.7
No	85	73.3

Mother's knowledge on childcare practices: Mothers' knowledge about child nutrition and health revealed significant gaps, particularly in understanding the appropriate timing for complementary feeding, sarbottam pitho, preparation, and the causes of malnutrition. While awareness of diarrhea was high, many mothers lacked clarity about its causes, dietary practices during illness, and ORS preparation. Knowledge about nutritional supplements like baal-vita and nutrient in rice water was limited. However, awareness of growth monitoring, vitamin A supplementation, deworming, and the use of iodized salt was relatively better. Food hygiene practices showed some adherence, with most mothers washing vegetables before cutting, though improvement is needed.

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Table 5 Mother's knowledge on childcare practices

Variables	Frequency	Percent
Complementary feeding knowledge		
At 6 months	35	30.2
Other	81	69.8
Frequency of complementary feeding		
Less than 3 times	29	25.0
3 or more times	87	75.0
Knowledge about Sarbottam Pitho		
Yes	38	32.7
No	78	67.3
Knowledge about malnutrition		
Yes	25	21.6
No	91	78.4
Reason for malnutrition		
Right	17	14.7
Wrong	8	6.9
Don't know	91	78.4
Knowledge about diarrhea		
Yes	112	96.6
No	4	3.4
Reason for diarrhea		
Right	67	57.7
Don't know	49	42.3
Knowledge on ORS preparation		
Yes	55	47.4
No	61	52.6
Foods during diarrhea		
Soup	13	11.2
Same as usual	41	35.3
No idea	62	53.4
Knowledge about baal-vita		
Yes	35	30.2
No	81	69.8
Knowledge about Growth Monitoring		
Yes	78	67.2
No	38	32.8
Vitamin A and de-worming supplement		
Yes	102	87.9
No	14	12.1
Knowledge about nutrients in rice water		
Yes	47	40.6
No	69	59.4

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Variables	Frequency	Percent
Knowledge on salt consumption		
Iodized salt	113	97.4
Normal salt	3	2.6
Wash vegetables		
Before cutting	72	62.1
After cutting	44	37.9

Mother's Knowledge score level: There were twenty self-administered questionnaires related to knowledge. Based on the responses, each correct answer was given a score of 'one' and the wrong answer was given a score of 'zero'. The mother's knowledge level score was taken from the similar study published in National Journal of Community Medicine in which 0 to 10 scores indicate poor knowledge, 11 to 16 scores indicate average and 17 to 20 scores indicate good knowledge score of mothers (Shettigar *et al.*, 2013).The scores found for mothers of the study area are shown in Table. The score was ranges from minimum 6 to maximum 17. Table 6 shows that, 57 (49.1%) of mothers had poor knowledge, 50 (43.1%) of mothers had average knowledge and 9 (7.8%) of mothers had good knowledge regarding breastfeeding and childcare practices. From the result obtained, it can be concluded that higher percent of mothers had poor knowledge regarding breastfeeding and childcare practices.

Table 6 Mother's knowledge level score (n=116)

Level of knowledge	Scores	Mothers(n=116) (%)
Poor	0-10	57 (49.1%)
Average	11-16	50 (43.1%)
Good	17-20	9 (7.8%)

Nutrition status of children*:* Among 116 children, 29.3% of the children were stunted with 6% severely stunted. Similarly, 24.1% were found to be wasted with 6.9% severely wasted. The prevalence of underweight was found among 33.6% of children and among them 8.6% were severely underweight as shown in Figure1.

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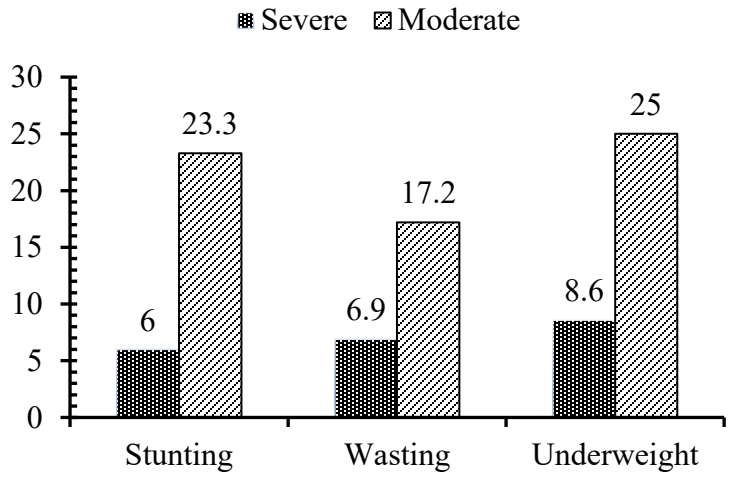

Fig:1 Nutrition status of children in study population

Distribution of wasting, stunting and underweight among different age group:

Severe wasting was highest in the 24-35 months group and absent in the 48-59 months group. Moderate wasting peaked in 12-23 months. Severe stunting was most prevalent in 36-47 months, with no cases in 6-11 and 48-59 months. Moderate stunting was highest in 24-35 months. Severe underweight was most common in 36-47 months and absent in 6-11 months, while moderate underweight peaked in 24-35 months.

Table 7 Distribution of malnutrition among different age group

Age groups (months)	N	WHZ (%)		HAZ (%)		WAZ (%)	
		<-3 SD	<-2 SD	<-3 SD	<-2 SD	<-3 SD	<-2 SD
6-11	20	5.0	20.0	Nil	20.0	Nil	15.0
12-23	30	6.7	26.7	6.7	20.0	13.3	26.7
24-35	21	14.3	19.0	4.8	33.3	14.3	33.3
36-47	19	10.5	15.8	21.1	31.6	15.8	21.1
48-59	26	Nil	3.8	Nil	15.4	3.8	19.2

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Distribution of malnutrition based on gender: The study revealed that wasting and underweight were more prevalent in male children, while stunting was higher in female children.

Table 8 Distribution of nutritional situation according to gender

	Severe	Moderate	Normal
Wasting			
Male	5(9.1%)	12(21.8%)	38(69.1%)
Female	3(4.9%)	8(13.1%)	50(82.0%)
Stunting			
Male	3(5.5%)	11(20.0%)	41(74.5%)
Female	4(6.6%)	16(26.2%)	41(67.2%)
Underweight			
Male	6(10.9%)	15(27.3%)	34(61.8%)
Female	4(6.6%)	14(22.9%)	43(70.5%)

Distribution of malnutrition based on MUAC: On the basis of Mid-Upper Arm Circumference (MUAC), 6.1 % of children were found to be severely malnourished, 15.5 % were moderately malnourished and remaining children were normal.

Table 9 Malnutrition based on MUAC

MUAC range	Frequency	Percent
Severe (< 11.5)	7	6.1
Moderate (11.5-12.5)	18	15.5
Normal (≥ 12.5)	91	78.4

Association between mother's knowledge score and malnutrition: Mothers' knowledge was initially categorized into three levels based on total knowledge scores: poor (0–10), average (11–16), and good (17–20). However, for inferential analysis, categories were collapsed into two groups (poor and good, with average and good combined) due to small expected cell counts, in order to meet the assumptions of the Chi-square test. Analysis indicated a statistically significant ($p<0.05$) association between mothers' knowledge on breastfeeding and childcare practice with stunting and underweight, but not with wasting (Tab. 10). Prevalence of stunting and underweight was significantly higher among children whose mothers had poor knowledge level. Similar study

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conducted in Nigeria also showed a significant association between maternal nutrition knowledge with stunting and underweight but not with wasting (Jemide *et al.*, 2016b).

Table 10 Association between mother's knowledge score and malnutrition (n=116)

Mothers' knowledge	**WFH**		**χ2**	**p-value**
	Wasted	Normal		
Poor	13 (22.8%)	44 (77.2%)	0.42	0.516
Good	15 (25.9%)	44 (74.1%)		
HFA				
	Stunted	Normal		
Poor	24 (42.1%)	33 (57.9%)	8.12	0.004*
Good	10 (16.9%)	49 (83.1%)		
	WFA			
	Underweight	Normal		
Poor	26 (45.6%)	31 (54.4%)	6.01	0.014*
Good	13 (21.7%)	46 (78.3%)		

*Statistically significant at 5% level of significance (p-value <0.05).

Conclusion: This study highlights the critical issue of malnutrition among Musahar children in Ratuwamai Municipality, revealing significant challenges in their nutritional status. The findings indicate that malnutrition manifests in various forms, with children in specific age groups being particularly vulnerable to wasting, underweight, and stunting. Additionally, the study highlights a concerning gap in maternal knowledge about proper breastfeeding and childcare practices, which is significantly linked to poor nutritional outcomes in children. To combat malnutrition effectively, it is essential to enhance maternal education and implement targeted nutritional interventions that address the specific needs of this community.

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