

# Nutritional Status and Practices among Urban Children: A Hospital-based Cross-sectional Study

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## ABSTRACT

**Background:** Child undernutrition has been a prevailing issue in Nepal and the burden still remains unacceptably high. It is important to look at how infants and young children's feeding practices and nutritional status are affected by nutrition transitioning in rapidly urbanizing Nepal.

**Methods:** A cross-sectional research design was employed with healthy children aged 6-23 months and their mothers visiting the hospital for regular immunization services as the study population. Data was collected from 305 children over six months from September 2019 to January 2020. Anthropometric measurements (weight and length) were collected of all children and their mothers'/care takers were interviewed on the Infant and Young Child Feeding practices. Data was analyzed using WHO Anthro Survey Analyzer, Microsoft Excel and STATA 15

**Results:** Early initiation of breastfeeding was 47.9% and use of bottle was 48.5%. Minimum dietary diversity, minimum meal frequency and minimum acceptable diet were 66.2%, 79.1% and 54.4% respectively. Consumption of nutrient-poor packaged foods was 63.0% with biscuits being the most common type (52.1%) and 32.8% of the children were found to be drinking tea. Overall, 13.8% of the children were stunted, 3.9% were underweight and 1.7% were wasted while 2.3% were overweight.

**Conclusions:** Practices related to breast feeding and diets of young children in urban areas of Nepal are not optimal with only around half meeting the minimum standards recommended by the WHO. Therefore, there is a pressing need to wake up to the rapidly changing dietary patterns among young children through necessary urban nutrition policies and programmatic interventions.

**Keywords:** Breastfeeding; child nutrition; Infant and young child feeding; Nepal; nutrition transition

## INTRODUCTION

Nepal is among the fastest urbanizing countries in the world.<sup>1</sup> Child undernutrition rates in the urban areas of Nepal are a significant public health concern. The NMICS 2020 found 29%, 22% and 11% of the urban under five years children to be stunted, underweight and wasted respectively.<sup>2</sup> The prevalence of stunting is 'very high' and wasting is 'medium' as per the WHO child malnutrition thresholds.<sup>3</sup> Overweight and obesity among under five children in 'urban Kathmandu valley' was 3.3%.<sup>2</sup> However, the urban child malnutrition prevalence among children under two years is not available.

Infant and Young Child Feeding (IYCF) practices have worsened and minimum dietary diversity (MDD) and minimum acceptable diet (MAD) are currently at 40% and 31% respectively with no significant difference between

rural and urban areas.<sup>2</sup> We set out to simultaneously assess nutritional status and child feeding practices among urban children aged 6-23 months.

## METHODS

This cross-sectional study was conducted at Siddhi Memorial Hospital, Bhaktapur. Healthy children aged 6-23 months and their mothers who were either permanent or current residents of Bhaktapur and were visiting the hospital for regular immunization services were selected by simple random sampling. Sample size estimations were calculated based on the primary outcomes of interest, which were to assess child malnutrition burden and child feeding practices with a confidence level of 95 percent and 5 percent margin of error. So, a sample size of 300 was deemed sufficient.

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Data was collected from September 2019 to January 2020. Anthropometric measurements (weight and length) were collected from 305 children and their mothers/ caretakers were interviewed on the IYCF practices via a semi-structured questionnaire. The study questionnaires were pretested among a different group of children and their mothers prior to the study. Children's ages were calculated from their date of birth and the date of data collection. The anthropometric measurements and IYCF information were validated each time by the two data collectors with additional quality monitoring by the first author.

Outcomes were children's nutritional status: the proportion of stunting, underweight wasting, overweight and obesity along with the corresponding mean z-scores; standard IYCF practices: proportion of children with early initiation of breastfeeding (EIBF), continued breastfeeding, feeding from a bottle, MDD, minimum meal frequency (MMF) and MAD. In addition, we also examined the frequency and types of nutrient-poor packaged foods consumption.

Ethical approval was received from Siddhi Memorial Hospital and Nepal Health Research Council (reference number 718-2019.) Information about the purpose of the study was verbally communicated to the mothers/ caretakers to receive consent prior to data collection.

Data was analyzed using WHO Anthro Survey Analyzer, Microsoft Excel and STATA 15. Microsoft Excel was used to determine frequencies and proportion of demographic and socio-economic characteristics of study children and their caregivers as well as IYCF practices and consumption of nutrient-poor packaged foods. WHO Anthro Survey Analyzer was used for the analysis of anthropometric measurement (weight for age, weight for length/height and length/height for age and its cut off point based on WHO standard and STATA 15 were used to analyze the collected data on child nutritional status.

## RESULTS

Slightly more males (53.1%) than females (46.9%) were sampled and there were more children in the older age group of 12-23months (58.4%) than among 6-11 months (41.6%.) As reported by mothers/caretakers, most of the children (88%), had normal birth weight, i.e. more than 2.5 kilograms. Almost four out of 10 (37.4%) were born through cesarean section delivery. Given the location of the hospital or the study site amidst traditional Newar community, more than half of the sampled children were of Newar ethnicity (55%), followed by Janjati (26.9%) and Chhetri (11.1%) (Table 1).

**Table 1. Demographic and socio-economic characteristics of sampled children aged 6-23 months.**

Characteristics	N	%
<b>Gender</b>		
Female	143	46.9
Male	162	53.1
<b>Age in months</b>		
11-Jun	127	41.6
23-Dec	178	58.4
<b>Birth weight</b>		
Low birth weight (<2.5 kg)	30	9.8
Normal birth weight (>2.5 kg)	270	88.5
NA	5	1.6
<b>Type of delivery/birth</b>		
Vaginal	191	62.6
Cesarean Section	114	37.4
<b>Ethnicity</b>		
Brahmin	15	4.9
Chhetri	34	11.1
Dalit	6	2
Janajati	82	26.9
Newar	168	55.1

Majority of primary care givers were mothers (79.3%) followed by grandmothers (11.5%). There were very few mothers who had never attended school (4.3%) while most of the mothers had attended secondary level education (33.8%) followed by higher secondary level (26.6%) and bachelor's degree (20%) but very few had a Master's degree (6.2%). Fathers' education levels were also like that of the mothers. More than two third of the mothers were home makers (68.2%) while around a third (31.5%) were engaged in some form of income generating activities (Table 2).

**Table 2. Characteristics of caregivers of sampled children.**

Characteristics	N	%
<b>Primary caretaker</b>		
Mother	242	79.3
Father	5	1.6
Grandmother	35	11.5
Mother & Father	8	2.6
Mother & Grandmother	4	1.3
Father & Grandmother	3	1
Others	8	2.6
<b>Mother's education</b>		
No education (never attended school)	13	4.3

Primary (0-5 years of school)	28	9.2
Secondary (6-10 years of school)	103	33.8
Higher secondary (11-12 years of school)	81	26.6
Bachelor's degree	61	20
Master's degree	19	6.2
<b>Mother's occupation</b>		
Homemaker	208	68.2
Engaged in income generation	96	31.5
NA	1	0.3

Breastfeeding was nearly universal amongst the sampled children as almost all of them (97.7%) were breastfed at sometime. Breastfeeding rates were still almost equally high (94.1%) at one year of age. However, only less than half of the children (47.9%) were breastfed within one hour of birth. Almost half (48.5%) of the children were fed from a bottle in the previous 24 hours.

Overall, 66.2% of the children had received MDD, 79.1% had received MMF and 54.4% had MAD the previous day (Table 3).

Almost two third (63.0%) of the children aged 6-23 months had consumed nutrient-poor packaged foods in the past 24 hours. Similar proportion of them (62.7%) had consumed at least once while a quarter of them (25.4%) had consumed twice. Majority of the children were given those foods by mothers (64.1%) followed by fathers (12.5%) and grandmothers (9.4%). Biscuits was the most commonly given packaged food (52.1%) followed by chocolates (17.7%) and to a lesser extent various combination of the nutrient-poor packaged foods were given to the children (Table 4).

**Table 3. Infant and young childfeeding practices among sampled children aged 6-23months as reported by their mothers.**

IYCF practices	Total N	N	%
Children who were ever breastfed	305	298	97.7
Children with timely initiation of breastfeeding (within 1 hour)	305	146	47.9
Children 12-15 months with continued breastfeeding at 1 year	119	112	94.1
Children 20-23 months with continued breastfeeding at 2 years	4	4	100
Children who were fed from a bottle with a nipple	305	148	48.5
Children 6-8 months with timely initiation of complementary foods	4	4	100
Children who received the minimum dietary diversity	305	202	66.2

Children who received the minimum meal frequency	287	227	79.1
Children who received the minimum acceptable diet	287	156	54.4
Mean number of food groups fed	4		

*Note: <sup>1</sup>Minimum dietary diversity: Intake from at least four of the seven main food groups in the previous day. (The seven food groups include grains, roots and tubers, legumes and nuts, dairy products (milk, yogurt, and cheese), flesh foods (meat, fish, poultry and liver/organ meats), eggs, vitamin A rich fruits and vegetables, and other fruits and vegetables.)*

*<sup>2</sup>Minimum meal frequency: The child consuming the minimum number of solid, semi-solid or soft food snacks/meals the previous day. (two or more times per day for a breastfed child aged 6-8 months; three or more times for a breastfed child aged 9-23 months and four or more times for non-breastfed children aged 6-23 months. Meals include both meals and snacks)*

*<sup>3</sup>Minimum acceptable diet: The composite of the minimum meal frequency and minimum dietary diversity consumed by the children currently breastfeeding in the previous day. (For non-breastfeeding children, it is the composite of children who had at least 2 milk feeds and had the minimum dietary not including milk feeds, and the minimum meal frequency the previous day.)*

In addition, one third of the children (32.8%) were given tea in the previous 24 hours and often it was given together with the biscuits as reported by the mothers (Table 4).

**Table 4. Practices of nutrient-poor packaged foods consumption of sampled children aged 6-23 months as reported by their mothers/caretaker.**

Consumption of nutrient-poor packaged foods	N	%
<b>Intake of any sugary or salty packaged food</b>		
Yes	192	63
No	112	36.7
Don't know	1	0.3
<b>If yes, then frequency of intake of any sugary or salty packaged food</b>		
1	121	62.7
2	49	25.4
3	14	7.3
>3	8	4.1
<b>Who usually gives the sugary or salty packaged food</b>		
Mother	123	64.1
Father	24	12.5
Grandmother	18	9.4
Grandfather	3	1.6
Mother & Father	5	2.6
Siblings	12	6.3
Other relatives	7	3.6
<b>Type of sugary or salty packaged food given</b>		

Chocolates	34	17.7
Biscuits	100	52.1
Chocolates and biscuits	17	8.9
Chips or Cheeseball	15	7.8
Noodles	6	3.1
Pastries	1	0.5
Two or more of above foods	19	9.7

Overall, 13.8% of the children were found to be stunted, 3.9% to be underweight and 1.0% to be wasted while 2.3% were overweight (Table 5).

Undernutrition was slightly higher amongst males than in females in all three indices. Stunting rates with 95% confidence interval was 14.8% (10.1; 21.2) among males versus 12.7% (8.1; 19.3) among females; underweight rates with 95% confidence interval was 4.9% (2.5; 9.6) among males versus 2.8% (1.0; 7.3) among females; and wasting rates with 95% confidence interval was 1.9% (0.6; 5.7) among males versus 1.4% (0.3; 5.5) among females. Overweight and obesity on the other hand was found to be slightly higher

among females, the rate with 95% confidence interval being 2.8% (1.1; 7.3) versus 1.9% (0.6; 5.7) among males.

Stunting was higher in older age groups among the 12-23 month olds in comparison to 6-11 month olds 17.1% (12.2; 23.5) versus 9.3% (5.3; 15.7) respectively.

Stunting and underweight burden were higher among children who were born with low birth weight: stunting with 95% confidence interval was 23.3% (11.5; 41.6) among those who were reported to be born low birth weight versus 13.0% (9.5; 17.6) among those reported to be born normal birth weight; underweight with 95% confidence interval was 6.7% (1.7; 23.2) among children with low birth weight versus 3.7% (2.0; 6.8) among those who had normal birth weights. However, wasting as well as overweight and obesity was found only among those born normal birth weight in this sample. Amongst children who were born normal birth weight, wasting with 95% confidence interval was 2.6% (1.2; 5.4) and overweight/obesity with 95% confidence interval was 1.1% (0.4; 3.4).

Table 5. Stunting among sampled children aged 6-23 months and disaggregation by selected characteristics.

Group	Weighted N	Unweighted N	-3SD (95% CI)	-2SD (95% CI)	z-score mean (95% CI)	z-score SD
All children	304	304	2.0 (0.9; 4.3)	13.8 (10.4; 18.2)	-0.7 (-0.9; -0.6)	1.14
<b>Child's age group</b>						
06-11 mo	129	129	1.6 (0.4; 6.0)	9.3 (5.3; 15.7)	-0.5 (-0.7; -0.3)	1.07
12-23 mo	175	175	2.3 (0.9; 6.0)	17.1 (12.2; 23.5)	-0.9 (-1.0; -0.7)	1.18
<b>Child's Sex:</b>						
Female	142	142	1.4 (0.3; 5.5)	12.7 (8.1; 19.3)	-0.6 (-0.8; -0.5)	1.13
Male	162	162	2.5 (0.9; 6.4)	14.8 (10.1; 21.2)	-0.8 (-1.0; -0.6)	1.15
<b>Maternal Education</b>						
No Education	13	13	0.0 (0.0; 0.0)	7.7 (1.1; 39.3)	-1.0 (-1.4; -0.7)	0.66
Primary	28	28	0.0 (0.0; 0.0)	10.7 (3.5; 28.6)	-0.7 (-1.1; -0.3)	1.04
Secondary	102	102	1.9 (0.5; 7.5)	20.4 (13.7; 29.3)	-0.9 (-1.1; -0.7)	1.06
Higher Secondary	81	81	1.2 (0.2; 8.3)	6.2 (2.6; 14.0)	-0.6 (-0.8; -0.4)	1
Bachelors	60	60	3.3 (0.8; 12.5)	15.0 (8.0; 26.5)	-0.6 (-1.0; -0.3)	1.36
Masters	19	19	5.3 (0.7; 29.6)	15.8 (5.1; 39.3)	-0.4 (-1.1; 0.3)	1.61
<b>Child's Ethnicity</b>						
Brahmin	15	15	6.7 (0.9; 35.5)	13.3 (3.3; 40.7)	-0.6 (-1.2; 0.1)	1.37
Chhetri	34	34	2.9 (0.4; 18.3)	23.5 (12.2; 40.6)	-0.9 (-1.3; -0.5)	1.23
Dalit	6	6	0.0 (0.0; 0.0)	16.7 (2.3; 63.4)	-0.9 (-1.5; -0.4)	0.77
Janajati	82	82	1.2 (0.2; 8.2)	9.8 (4.9; 18.4)	-0.8 (-1.0; -0.5)	1.01
Newar	167	167	1.8 (0.6; 5.5)	13.8 (9.3; 19.9)	-0.7 (-0.9; -0.5)	1.18
<b>Birthweight Status</b>						
LBW	30	30	6.7 (1.7; 23.2)	23.3 (11.5; 41.6)	-1.2 (-1.5; -0.8)	1.01
NBW	269	269	1.5 (0.6; 3.9)	13.0 (9.5; 17.6)	-0.7 (-0.8; -0.5)	1.15

The findings did not show any consistent pattern in the malnutrition status of the children by parental education levels and by the type of delivery. With regards to child's ethnicity, Chhetri children had the highest levels of stunting

and underweight as well as overweight/obesity but not wasting which was present only among Newar children (table 6).

**Table 6. Wasting and overweight/obesity among sampled children aged 6-23 months and disaggregation by selected characteristics.**

Group	Weighted N	Unweighted N	-3SD (95% CI)	-2SD (95% CI)	+2SD (95% CI)	+3SD (95% CI)	z-score mean (95% CI)	z-score SD
All	303	303	0.0 (0.0;0.0)	1.7 (0.7;3.9)	2.3 (1.1;4.8)	1.0 (0.3;3.0)	0.0 (-0.1;0.2)	1.05
<b>Child's age group</b>								
06-11 mo	128	128	0.0 (0.0;0.0)	1.6 (0.4;6.1)	3.1 (1.2;8.1)	2.3 (0.8;7.1)	-0.1 (-0.3;0.1)	1.1
12-23 mo	175	175	0.0 (0.0;0.0)	1.7 (0.6;5.2)	1.7 (0.6;5.2)	0.0 (0.0;0.0)	0.1 (0.0;0.3)	1
<b>Child's Sex:</b>								
Female	142	142	0.0 (0.0;0.0)	1.4 (0.3;5.5)	2.8 (1.1;7.3)	1.4 (0.3;5.5)	0.0 (-0.1;0.2)	1.05
Male	161	161	0.0 (0.0;0.0)	1.9 (0.6;5.7)	1.9 (0.6;5.7)	0.6 (0.1;4.3)	0.0 (-0.1;0.2)	1.05
<b>Maternal Education</b>								
No Education	13	13	0.0 (0.0;0.0)	1.7 (0.2;11.0)	1.7 (0.2;11.0)	0.0 (0.0;0.0)	0.3 (0.0;0.5)	1.12
Primary	28	28	0.0 (0.0;0.0)	1.2 (0.2;8.3)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (-0.2;0.2)	0.91
Secondary	102	102	0.0 (0.0;0.0)	0.0 (0.0;0.0)	5.3 (0.7;29.6)	5.3 (0.7;29.6)	0.4 (-0.1;0.9)	1.18
Higher Secondary	81	81	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	-0.4 (-0.9;0.1)	0.93
Bachelors	60	60	0.0 (0.0;0.0)	3.6 (0.5;21.6)	3.6 (0.5;21.6)	3.6 (0.5;21.6)	0.0 (-0.4;0.4)	1.15
Masters	19	19	0.0 (0.0;0.0)	2.0 (0.5;7.6)	3.9 (1.5;10.0)	1.0 (0.1;6.7)	-0.1 (-0.3;0.1)	1.05
<b>Child's Ethnicity</b>								
Brahmin	15	15	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	-0.1 (-0.4;0.3)	0.79
Chhetri	34	34	0.0 (0.0;0.0)	0.0 (0.0;0.0)	2.9 (0.4;18.3)	0.0 (0.0;0.0)	0.1 (-0.3;0.4)	1.09
Dalit	6	6	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	-0.6 (-1.3;0.1)	0.91
Janajati	82	82	0.0 (0.0;0.0)	0.0 (0.0;0.0)	2.4 (0.6;9.3)	1.2 (0.2;8.2)	-0.1 (-0.3;0.1)	0.99
Newar	166	166	0.0 (0.0;0.0)	3.0 (1.3;7.1)	2.4 (0.9;6.3)	1.2 (0.3;4.7)	0.1 (0.0;0.3)	1.09
<b>Birthweight Status</b>								
LBW	30	30	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	0.0 (0.0;0.0)	-0.3 (-0.6;0.1)	0.89
NBW	268	268	0.0 (0.0;0.0)	1.9 (0.8;4.4)	2.6 (1.2;5.4)	1.1 (0.4;3.4)	0.1 (-0.1;0.2)	1.06

## DISCUSSION

Our study unearthed many important findings on urban child nutrition in Nepal. Any breastfeeding is universal and is still very high until at least around one year of age. However, EIBF within the recommended one hour of birth and the practice of feeding children from a bottle with a nipple were not optimal. For instance, the NMICS 2020 which reported EIBF among 6-23 months in 'Urban Kathmandu Valley' had found it to be 28.5% only while our finding was higher at 47.9%. Some EIBF counseling given from the hospital during the routine antenatal and postnatal visits from might have had a positive effect on our study population. On the other hand, both our study as well as the urban Kathmandu Valley disaggregation of the NMICS 2020 found that around half of the children were fed from a bottle with a nipple. Breastfeeding is well established as vital for child survival and optimal child development with a host of benefits in any context for short and long term and thus ought to be upheld.<sup>4,5</sup> Our findings prompt towards paying specific attention to accelerate the protection, promotion and support of breastfeeding in Nepal's urban context.

The IYCF practices from our study were slightly better but comparable to that of NMICS 2020 for Urban Kathmandu Valley: the MDD was (66% versus 63.6%); the MMF was (79.1 % versus 75.7%) and the MAD was (54.4% versus 47.1 %) respectively. Overall, our findings indicate some positive aspects on the IYCF practices while also pointing out that much remains to be done to improve diet of the youngest age groups in urban areas of Nepal.

The findings we have unearthed on consumption of nutrient-poor packaged foods add troubling dimensions to the prevailing feeding practices among urban Nepali children. These are also not captured through the standard IYCF indicators being reported by the national surveys. The fact that our study documented two-thirds (63%) of the small children to be consuming nutrient-poor packaged foods ought to warrant attention. Biscuits were the most commonly given packaged food which were often displacing the proper meals. The NMNSS 2016 had documented almost universal consumption (95.6%) of biscuits and cookies by Nepali households which might have been an easy and appealing option to give to the children too. We also found that more than a third of the young children were given tea and often with the biscuits. The NMNSS 2016 had also reported similar proportion of (31.8%) of tea consumption among urban children aged 6-23 months. This has dual consequences for poor child nutrition - on one hand they are getting nutrient poor commercial snack foods

that also tend to replace proper meals. On the other hand, the inhibitory compounds present in tea can interfere with absorption of critical nutrient like iron among an already vulnerable population affecting their mental and physical developments.<sup>6</sup> Additional worrying finding from our study is that mostly mothers themselves (64.1%), the primary caregivers of the majority of the children, were giving these foods to their babies. A recent study had found that most families live within a five minutes-walk to a store selling unhealthy processed foods.<sup>7</sup> A 2016 study conducted in Kathmandu valley reported that 85.4% of mothers had seen promotion of nutrient-poor foods for children and 74.1% of children aged 6-23 months had consumed those foods.<sup>8</sup> Another study conducted in Kathmandu valley had also found that 48.5% of caregivers cited convenience as a major reason for giving such foods.<sup>9</sup> Other reasons could range from lack of knowledge about poor nutrient composition of those foods, exposure to constant advertisements, easy availability or combinations of such factors. Early life taste and food preferences are considered important to influence later food choices and health, foods high in sugar, salt and fat during complementary feeding period increases predisposition towards such foods later in life too.<sup>10</sup> The underlying drivers for this have to be comprehensively understood and need to be holistically addressed.

The child malnutrition burden documented by our study is at 'medium' threshold for stunting (13.8%) while at 'low' for wasting (1.0%) and for overweight (2.3 %).<sup>3</sup> We are unable to compare our findings as there are no other similar studies in Nepal have looked at urban child malnutrition in the 6-23 months age group. The urban Kathmandu valley disaggregation of the NMICS 2020 is also not comparable as it is presented for children under age five years. As expected, our study found that children born with normal birth weight had lower rates of stunting and underweight. However, our findings on child wasting were perplexing. Of those children who were wasted, all were reported to have been born normal weight. Another significant finding is that amongst this sample of young children, overweight and obesity is higher than wasting which is something to be wary of and is also observed by the NMICS 2020 among children under age five for urban Kathmandu Valley. Whilst our study did not look at associations, one possible reason could be that the association with increasing consumption of high calorie but nutrient poor unhealthy foods. A recent study had explored and showed an association of nutrient-poor packaged foods consumption with inadequate nutrient intakes and poor child growth among urban children in urban Kathmandu.<sup>11</sup> Such association needs to be

explored with regards to early childhood overweight and obesity too in this setting, which is also concurred by findings of a related systematic review.<sup>12</sup> This is especially necessary in view of that poor quality of diet in early childhood have been linked to adiposity in later childhood.<sup>13,14</sup> Furthermore, excessive weight gain in early childhood predisposes children to obesity and non-communicable diseases later on in life too.<sup>15</sup>

Our study had certain limitations. Due to resource constraints, a larger sample size was not possible, thus some of the results have wide confidence intervals. The purposive sampling lacked representativeness of the overall urban Kathmandu valley and might have captured population groups who are generally more likely to visit the hospitals. There could be some respondents' social desirability bias for self-reports of IYCF practices. Also, our study was not designed to be able to conduct logistics regression analysis which could have helped to explain the association of some of our findings.

This study adds to the evidence that practices related to breastfeeding and diets of young children in urban areas of Nepal are not optimal with only around half meeting the minimum standards recommended by the WHO. There are also apparent shifts towards the consumption of commercially produced nutrient-poor foods and indications of rising overweight and obesity in the young urban children. Targeted urban nutrition responses have not yet fallen within the purview of the government or development agencies as the prevailing issues in rural areas still get the focus and the priority. The rapid pace of urbanization taking place in Nepal should not be forgotten. Global calls have been made for double-duty actions to holistically address undernutrition, overweight, obesity and diet-related non-communicable diseases in order to end malnutrition in all its forms.<sup>16</sup> Therefore, there is a pressing need to wake up to these unfolding malnutrition realities in urban areas and carve out necessary urban nutrition policies and programmatic interventions accordingly.

Multi-pronged approaches are also required in urban areas such as those that bring systemic changes to curtail harmful advertising and marketing of breast milk substitutes and unhealthy commercial foods as well as explore the potential role of urban and/or peri-urban agriculture in shaping diets and nutrition.<sup>17,18</sup> At the same time, nutrition social behavior change communication ought to be introduced and accelerated through innovative ways and utilizing non-traditional platforms like hospitals, day-care centers and preschools to widen the reach and ensure that no child is left behind in the spirit of Sustainable Development Goals.

## CONCLUSIONS

The rising adverse nutrition issues among young children in the urban and peri-urban Nepali context can still be nipped in the bud before they get too pervasive. We mention policy makers, program planners and researchers to pay attention to the rapidly changing dietary patterns among young children and the associated child malnutrition emerging in the urban areas of Nepal.

More studies should be conducted with larger sample sizes in multiple urban settings and should also look at the underlying determinants of the consumption of nutrient-poor packaged food among young children and their association with child nutritional status. Unhealthy foods consumption practices also ought to be captured by periodic national surveys like the NDHS and the NMICS. Special disaggregation for IYCF and child malnutrition indicators should be presented for the most densely populated urban areas as combining with overall urban areas may dilute and skew the actual situation.

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## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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