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Nutritional Status of Rural and Urban Under-Five Children in Tangail District, Bangladesh

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ABSTRACT: A descriptive cross-sectional study was carried out among 144 under-five children from rural (n=72) and urban (n=72) area in Tangail, Bangladesh. The major objective of this study was to assess and compare their socioeconomic information and nutritional status among rural and urban children. This study initiated that almost one half participants in urban area were nuclear family (<4 member) but major participants in rural area (44.5%) were contained 6-7 family member. In rural area, the occupations of household head were mainly farmer (44.4%) while more than two third were engaged themselves in business in urban areas. Anthropometric indices of weight-for- height (WHZ), weight-for-age (WAZ), height-for-age (HAZ) and Body Mass Index (BMI) for Age (BAZ) z-score were used to estimate the children's nutritional status. It was found for WHZ in rural area that 1.39% children were severely wasted, 1.39% were moderately wasted, 22.23% were mildly wasted and there were no severe overweight but in urban areas 25%, 2.78% and 1.38% were mild overweight, moderate overweight and severe overweight respectively. For WAZ, the results also stated that, the children from rural area were underweight (38.8% mildly underweight and 25% moderately underweight) rather than overweight but inverse results were found for urban children. For HAZ, the prevalence of moderately stunting among rural children (44.45%) was higher than urban children (2.78%). From BAZ, the prevalence of obesity was presented higher among the urban children. As most of the rural children were wasted, underweight and stunted, it should be provided community education concerning about nutritional knowledge, environmental sanitation and personal hygienic practices, breast-feeding and weaning practices, nutritional deficiency diseases, nutritional value of food and dietary practices would perhaps overturn the trends.

KEYWORDS: Under-five children, socio-economic status, Nutritional Status, WHO growth chart and Z-Scores.

1 INTRODUCTION

Malnutrition among children is a major public health problem in developing countries including Bangladesh [1, 2], resulting from consumption of poor diet over a long period of time [3]. It has been reported that about 13 million infants and children, less than five years of age, die each year in developing countries and most of these deaths are attributed to under-nutrition [3, 4]. According to WHO criteria, 52% of young children in under-developed countries are considered normal, while

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48% of them are malnourished and 10% of them are severely malnourished [3, 5]. Although Bangladesh has already achieved a remarkable progress in reducing child malnutrition from 68% in the late 1980s to 41% in 2007 [6,7] and under-five mortality [8], still malnutrition is a common problem in this country [9]. It is one of the countries with very high burden of malnutrition. The underlying cause for 60% of the under-five deaths is malnutrition in Bangladesh [1,10].

Malnutrition among children is a critical problem because its effects are long lasting and go beyond child-hood. It has both short- and long-term consequences. For instance, malnourished as compared to non-malnourished children are physically, emotionally and intellectually less productive and suffer more from chronic illnesses and disabilities. Malnutrition among children depends on complex interactions of various factors reflecting socio-demographic, environmental, reproductive, institutional, cultural, political and regional factors [1,6,11].

A lot of studies found that the prevalence of malnutrition were higher in the rural area compared to urban area. Hence, this study was undertaken to identify and compare socio-economic status of family and their living environment and the nutritional status of under-five children among the urban and rural children in Tangail district, Bangladesh.

2 MATERIALS AND METHODS

The study was a descriptive cross-sectional study, which was focused on nutritional status in under five children in selected rural (Modhupur Upazilla) and urban area (Tangail town) in Tangail, Bangladesh. This epidemiological survey was conducted to find out the prevalence of disease, under nutrition, over nutrition and unhygienic condition of under-five children. Using a formula by Krejcie and Morgan (1970)[12], 163 participants (n=163) after 20% drop out were needed in the study. However, only 144 participants (n=144) based on inclusion criteria were recruited and assigned into two groups which are rural (n=72) and urban (n=72) were collected simple random sampling technique. The study population was aged 0 to 5 years old from both sex and their corresponding mother as a respondent. The data collection begins from January 2013 to September 2013.

The anthropometric measurements were taken three times and following standards protocol [13]. Anthropometric measurements taken were weight, height and Body Mass Index (BMI). The instruments that were used for anthropometric measurements were digital weighing scale, stadiometer as well as measuring tape. WHO (2006) [14] growth chart was used to compare the differences in the prevalence of malnutrition among the children from the rural and urban area.

For measuring weight, the children were asked to stand straight in the middle of the scale's platform without touching anything and the eyes were looking at the horizontal line. For measuring height, the children were asked to stand straight and look straight in a Frankfurt horizontal plane while the top of the stadiometer was lowered to the head [15].

A questionnaire that was modified from several studies was used to collect data. The questionnaire basically asked to obtain relevant information on anthropometric, socio-economic and demographic information (children characteristics, health, condition etc).

The research data were being analyzed by WHO anthro software.

3 RESULTS

3.1 DEMOGRAPHIC DATA

A descriptive cross sectional study was carried out among the 144, under-five children selected randomly from rural and urban area in Tangail. Table 1 shows demographic profile of urban and rural children in Tangail District and the number of 72 individuals selected from each area. It appeared that in Tangail region, 63.9% (n=46) of participants were Muslim and 5.6% (n=4) Hindu and 30.6% (n=22) Christian in rural area. On the other hand, most of the participant were Muslim 75% (n=54), while 25% (n=18) were Hindu but no Christian (n=0) in urban area.

Besides that, age of 75% (n=54) of participants were belonged to 0-24 months and 25% (n=18) of participants were 25-60 months in rural area .On the other hand, 52.8% (n=38) of participants were in the age group 0-24 months and 47.2% (n=34) of participants were belonged to 25-60 month in urban area.

Major participants in urban area (48.6 %, n=35) were contained less than 4 members in each family while major participants in rural area (44.5%, n= 32) were contained 6-7 family member. Thus it indicates that the nuclear family concept was more adopted in urban household compare to rural household in Tangail region.

Table 1 shows that in rural area the occupations of household head were mainly farmer about 44.4% (n= 32), day labor 15.3% (n=11), small business 13.9% (n=10) and also Govt. and private services holder 26.4% (n=19) while in urban household the majorities of household head were done business about 68.1% (n=59) and job 31.9% (n=23).

The highest monthly income (72.2%, n=52) was 4000-9000 BDT while the lowest monthly income (1.4%, n=1) was 14001-19000 BDT in rural area. On the other hand, 86.1% (n=62) of urban families income were above 24000 BDT.

In the urban, maximum families (68.1%, n= 49) expended more than 15000 BDT while in rural families, most of the respondents (73.6%, n=53) expended 3000-6000 BDT.

Table 1. Demographic Profile of Urban and Rural Children (Sample Size, n=142)

Parameters	No.		Percentage	
Location				
Rural	72		50	
Urban	72		50	
Religion	**Rural (No.)**	**Urban (No.)**	**Rural,%**	**Urban,%**
Muslim	46	54	63.9	75
Hindu	4	18	5.6	25
Christian	22	0	30.6	0
Children age (month)				
0-24	54	38	75.0	52.8
25-60	18	34	25.0	47.2
Family member (No.)				
<4	7	35	9.7	48.6
4-5	18	18	25.0	25.0
6-7	32	11	44.5	15.3
8-9	9	5	12.5	6.9
>9	6	3	8.3	4.2
Occupation				
Farmer	32	0	44.4	0
Business	10	49	13.9	68.1
Job	19	23	26.4	31.9
Day labor	11	0	15.3	0
Average household income (Monthly) in Taka (BDT)				
<4000	10	0	13.9	0
4000-9000	52	0	72.2	0
9001-14000	9	1	12.5	1.4
14001-19000	1	1	1.4	1.4
19001-24000	0	8	0	11.1
>24000	0	62	0	86.1
Average Family expenditure (Monthly)				
<3000	12	0	16.7	0
3000-6000	53	0	73.6	0
6001-9000	5	0	6.9	0
9001-12000	2	14	2.8	19.4
12001-15000	0	9	0	12.5
>15000	0	49	0	68.1

3.2 NUTRITIONAL STATUS AND ANTHROPOMETRIC INFORMATION

Fig. 1 shows the nutritional status of the under-five (a) rural and (b) urban children using the indicator-weight for height (WHZ) z-score according to WHO growth charts.

According to WHO growth chart, 1.39% (n=1), 1.39% (n=1) and 22.23% (n=16) children in rural area were severely wasted (<-3SD), moderately wasted (-3 to -2 SD) and mildly wasted (-1.99 to -1 SD) respectively but not seen in urban area

(n=0). The higher percentage of children in rural and urban area were normal weight (-.99 to 1 SD) and roughly equal portion that were 69.45% (n=50) and 70.84% (n=51) respectively. For mild overweight (1.01 to 2 SD), there were huge difference in both location where 2.78% (n=2) from rural and 25% (n=18) from urban were in this category. For moderate overweight (2.01 to 3SD), the percentage of children in rural and urban area were exactly similar (2.78%, n=2). Furthermore, 1.38% (n=1) were severe overweight (>3SD) in the urban area but not seen in rural area (n=0).

Fig. 2 shows the nutritional status of the under-five (a) rural and (b) urban children using the indicator-weight for age (WAZ) z-score according to WHO growth charts.

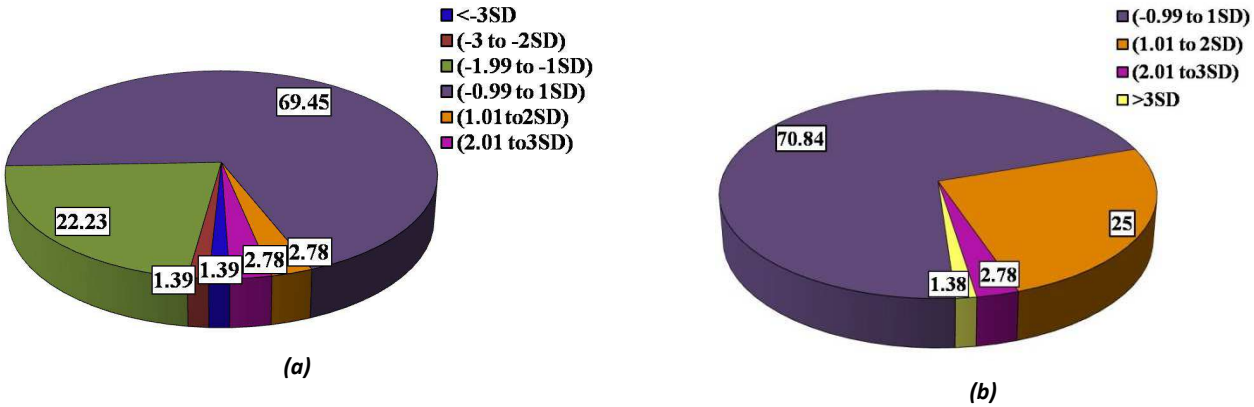

Fig. 1. Nutritional Status of The Under-Five (A) Rural and (B) Urban Children by Weight For Height (WHZ) Z-Score According to WHO Growth Charts

According to WHO growth chart, the higher percentage of children in rural area were mild underweight (-1.99 to -1 SD) which was 38.8% (n=28) where 8.34% (n=6) in urban were in this category. On the other hand, in urban area the higher percentage of children (80.56%, n=58) were normal weight (-0.99 to 1 SD) while 33.3% (n=24) in rural were in this group. For moderate underweight (-3 to -2 SD), there were huge difference between both location while 25% (n=18) and 2.78% (n=2) from rural and urban respectively were in this category. Only 2.78% (n=2) children in rural were severe underweight (< -3 SD). There are no children in urban area those belong to severe underweight. Moreover, 2.78% (n=2), 5.56% (n=4) and 2.78% (n=2) children in urban area were mild overweight, moderate overweight and severe overweight respectively but in rural area overweight children were not seen.

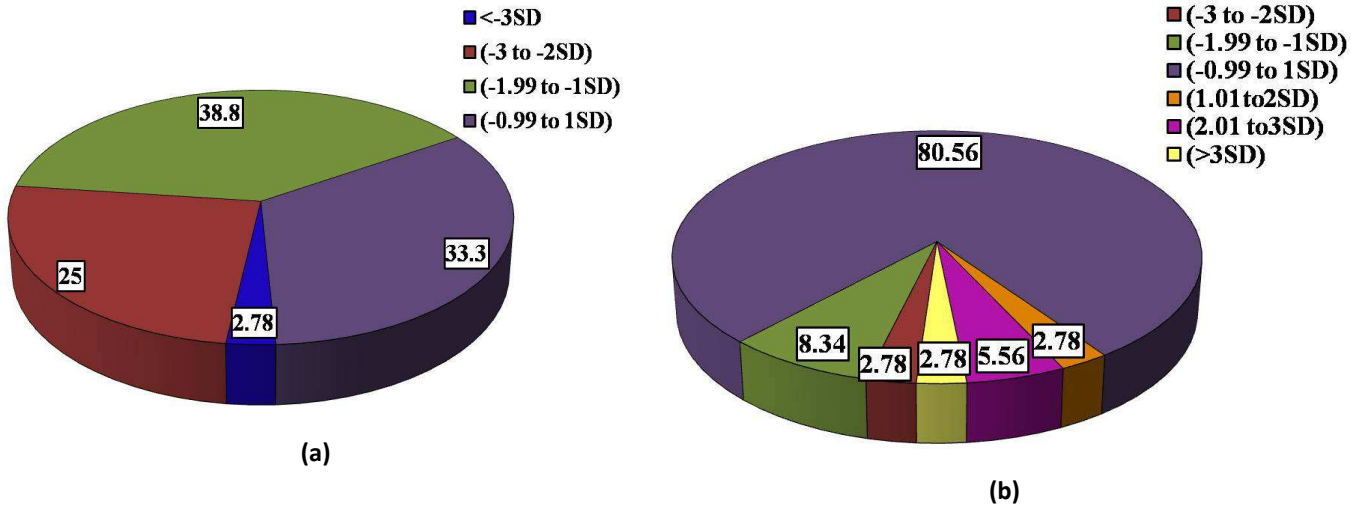

Fig. 2. Nutritional Status of The Under-Five (A) Rural and (B) Urban Children by Weight For Age (WAZ) Z-Score According to WHO Growth Charts

Fig. 3 shows the nutritional status of the under-five (a) rural and (b) urban children using the indicator-Height for age (HAZ) z-score according to WHO growth charts.

From the growth performance of children using the indicator height for age according to the z-score, 5.56% (n=4) of children were severely stunted (<-3SD), 44.45% (n=32) were moderately stunted (-3 to -2 SD), 12.5% (n=9) were mildly stunted (-1.99 to -1.00 SD) and 37.5% (n=27) were normal (-0.99 SD to 1 SD) in rural area. In urban area, 2.78% (n=2), 16.67% (n=12), 75% (n=54) and 5.56% (n=4) were moderately stunted (-3 to -2 SD), mildly stunted (-1.99 to -1.00 SD), normal (-0.99 SD to 1 SD) and mild oversized (1.01 to 2 SD) respectively.

Fig. 4 shows the nutritional status of the under-five (a) rural and (b) urban children using the indicator-BMI for age (BAZ) z-score according to WHO growth charts.

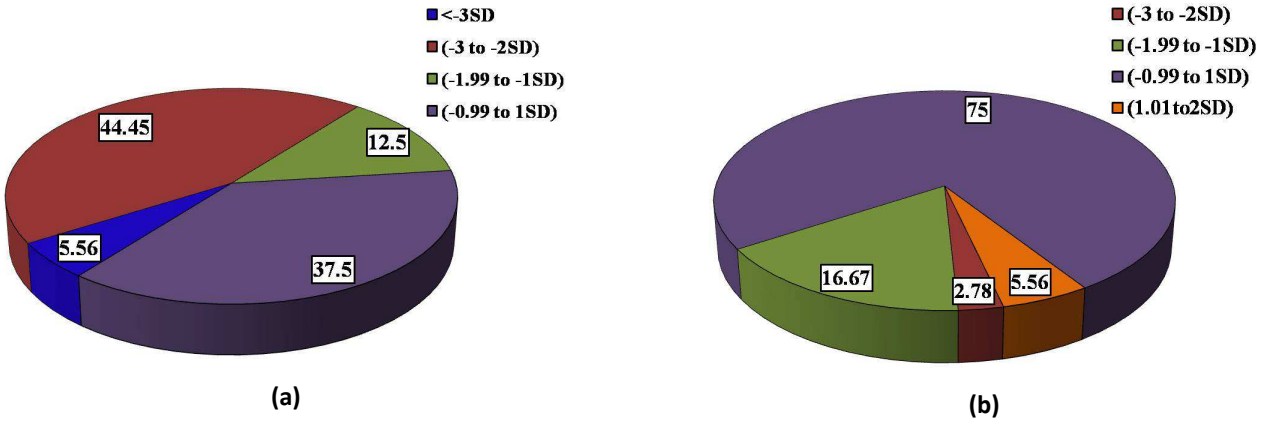

Fig. 3. Nutritional Status of The Under-Five (A) Rural and (B) Urban Children by Height For Age (HAZ) Z-Score According to WHO Growth Charts

The higher percentage of children in rural area (69.44%, n=50) were normal (-0.99 to 1SD) compared to 61.11% (n=44) of children from urban when WHO chart was used. 2.78% (n=2), 4.17% (n=3) and 18.05% (n=13) children were in severely wasting (<-3SD), moderately wasting (-3 to -2 SD) and mild wasting (-1.99 to -1 SD) respectively in rural area. There are no children in urban area those be the belongings of wasting. For mild overweight (-1.99 to -1 SD), there were huge difference between both location while 5.56% (n=4) and 29.17% (n=21) from rural and urban respectively were in this category. Furthermore, 5.56% (n=4) and 4.17% (n=3) children in urban were moderate overweight (2.01 to 3SD) and obese (>3SD) respectively but there were no children found in rural area where children nutritional status is in moderate overweight and obese.

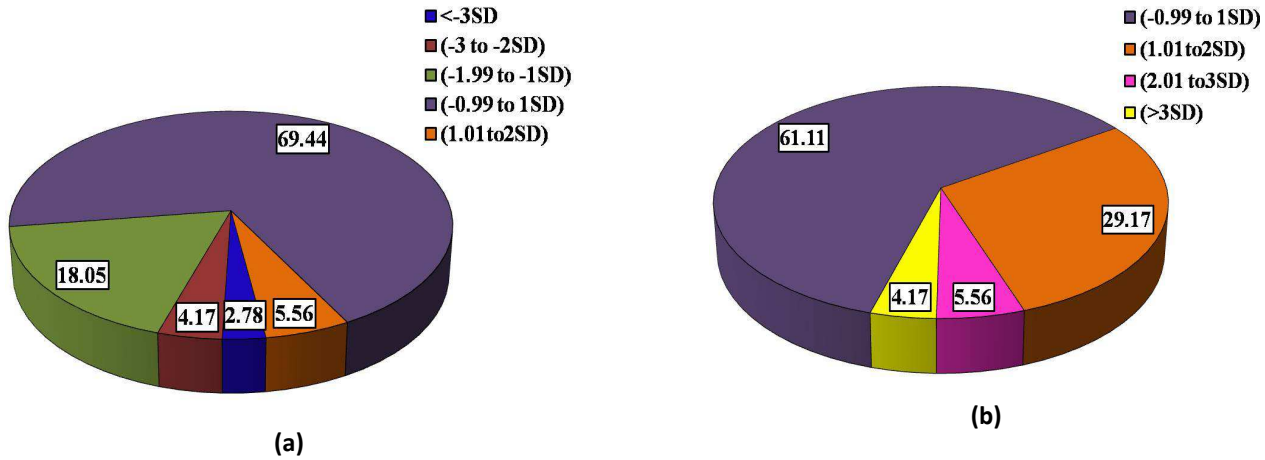

Fig. 4. Nutritional Status of The Under-Five (A) Rural and (B) Urban Children of Body Mass Index (BMI) for Age (BAZ) Z-Score According to WHO Growth Charts

4 DISCUSSION

Nutritional status is the condition of health of the individual as influenced by the utilization of the nutrients. Child malnutrition is a particular concern in developing countries that affects millions of young children [16]. Studies on the nutritional status of urban and rural areas are highly inadequate. A very few studies were carried out regarding nutritional situation of children in urban and rural areas. This is a forthcoming study performed in rural and urban areas to identify the stipulation of the nutritional status of under-five children at Tangail district, Bangladesh. The factors influencing nutritional status of under five children are age, weight, height, family income, family expenditure, family size, living status etc. Hence the present study was formulated to assess age, height and weight as indicators of growth and nutritional status of under five children of different socio-economic status and find the major socio-economic correlates of nutritional status in under-five children.

This study showed that about 75% and 25% children ages were within 0-24 and 24-60 months in rural area. On the other hand 52.8% and 47.2% children ages were within 0-24 and 24-60 months in urban area. It appeared that in Tangail region, about two third of participants were Muslim, 30.6% Christian and only 5.6% Hindu in rural area. On the other hand, most of the participants were Muslim, while one quarter were Hindu but no Christian in urban area. Family size also influences nutritional status of children. Almost half of participants in urban area were contained less than 4 members in each family while major participants in rural area were contained 6-7 family members. Thus it indicates that the nuclear family concept was more adopted in urban household compare to rural household in Tangail region. It was also noticed that, when increase in family size, decrease in nutritional status in children. The occupation as well as monthly income and expenditure of the rural area were significantly lower as compared to urban area. Family monthly income is another determinant of nutritional status of children. The distribution of almost half of the participants were farmer in rural areas while more than two third were engaged themselves in business in urban areas.

The total monthly income of nearly three fourth family in rural area were between BDT 4000-9000 where their average food expenditure between BDT 3000-6000 which are also affect nutritional status in children. Meanwhile the total monthly income of most urban family were more than BDT 24,000 where their average food expenditure more than BDT 15000. A tendency towards an increase nutritional status in under-five children with an increase in the family income. This may due to their ability to spend more money for food which is essential for good health of children.

Height and weight are the most commonly used measures, not only because they are rapid and inexpensive to obtain, but also because they are easy to use. The anthropometric data (weight and height), in this study were entered and analyzed using WHO anthro software.

For weight for height (WHZ), the results from this study recommended that the prevalence of obesity rather than wasting was higher among the urban children compared to rural children. This funding was similar to Bharati *et al.* (2009), who's found that the children in urban area were heavier and taller compared to the rural children [17]. Gonzalez-Suarez *et al.* (2009) also showed that most of the urban children in Filipine were overweight and obese [18]. But a difference study found by Aziz and Devi (2012) that children from urban were underweight rather than overweight in Malaysia [19]. The difference results between these studies might be due to economic status, knowledge of mother, hygienic condition, genetics, difference in culture and geographical condition.

For weight for age (WAZ), the results of this survey also stated that, the children from rural area were underweight rather than overweight but inverse results were found for urban children. Similarity was found in Bharati *et al.* (2010), who's recommended that the prevalence of underweight children in India is high in rural areas among families with uneducated parents and low standard of living [20]. Dissimilarity was clear in Maddah *et al.* (2010) that most of the children in urban area in Zahedan, Iran were underweight [21] and Aziz and Devi (2012) that children from urban area in Malaysia were underweight compared to rural children [19]. The difference results between these studies might be due to father occupations, average family expenditure for food, socio-economic status, health conditions of mother, hygienic condition, genetics, difference in culture and geographical condition.

For height for age (HAZ), the prevalence of moderately stunting among rural children was higher than urban children. Similar studies were found in Kamal (2011), who stated that most of the rural children in Bangladesh were stunted [22]. While dissimilarity was supported by Aziz and Devi (2012) that the incidence of stunting exists among urban children in Malaysia [19]. The difference results between these studies might be due to average family expenditure for food, food habit frequency, household size, socio-economic status, genetics and geographical condition.

For BMI for age (BAZ), the results from this survey also found that the prevalence of obesity was presented higher among the urban children. This condition is similar from a study completed by Aziz and Devi (2012) that urban children had higher

prevalence of obesity compared to rural children [19]. But different from Davis et al. (2010), who discovered that prevalence of obesity was higher among the rural children because they do not engage in physical activity as much as urban children [23]. The difference results between these studies might be due to average family expenditure for food, food habit frequency, physical activities, socio-economic status and geographical condition.

5 CONCLUSION

This study recognized that there was a difference between anthropometry status of children lived in rural and urban area. There was severe malnutrition among the children existing in rural area (Modhupur Upazilla in Tangail, Bangladesh) as most of the children were underweight, stunted and wasted. But prevalence of overweight and obesity were higher among the children in urban area (Tangail town). As the quality of future human resources depends on the present day children, improvement of the nutritional level of today's children should be given top priority [24]. The low values for anthropometry and socio-economic condition obtained from this study propose that there is need for improvement in the nutritional status of these rural children. There should be some training or any other education concerning about nutritional knowledge, environmental sanitation and personal hygienic practices, breast-feeding and weaning practices, nutritional deficiency diseases, nutritional value of food and dietary practices that increase the awareness of rural parents to take care their children with balance diets. And also urban parents, so that they can easily overcome those problems and can make sound health and body without wasting excess money.

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