

## SHORT ARTICLE

**A comparative study on gender disparity in nutritional status in children under five years in rural and urban communities of Assam, India**Farha Yesmin<sup>1</sup>, Rupali Baruah<sup>2</sup><sup>1</sup>Post-Graduate trainee,<sup>2</sup>Professor & Head, Department of Community Medicine, Guwahati Medical College, Assam

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**Abstract**

**Introduction:** Under nutrition is a serious public health problem among children in the developing countries. Though the importance of girl child has been stressed time and again, yet a wide level of disparity still exists, whether implicit or explicit, in nutrition and child care both in the rural and urban areas. Different underlying factors are responsible for this disparity. **Rationale:** Girls face discrimination from the moment she is born. The UNICEF intergenerational cycle of malnutrition stresses on the fact that the problem of malnutrition spans generation and is a vicious cycle. Though the importance of girl child has been stressed time and again, yet a wide level of disparity still exists. Therefore this study is conducted to document the gender disparity in nutritional status and compare rural and urban differences. **Objective:** 1.To compare the gender disparity in nutritional status in children aged 0-5 years in rural and urban areas.2.To assess the different socio-demographic factors influencing the gender disparity. **Materials and Methods:** A community based cross-sectional study was conducted in Kamrup Rural and Kamrup Urban using a pre-tested schedule from August 2013-July 2014.A total of 400 children were examined and their mother's interviewed. Data was entered into MS-Excel spread sheets for analysis. The statistical analyses were done using SPSS version 16 software. Percentages and Chi square tests were used to analyze epidemiological variables. **Results:** The prevalence of underweight, stunting and wasting in rural area was 31%, 29%, 15.5% respectively whereas in urban it was 39.5%, 36% and 24.5% respectively. In rural area, male child were 32% underweight, 28% stunted and 19% wasted compared to female who were 30% underweight, 30% stunted and 12% wasted. In urban area 48% of female child were underweight, 39% stunted and 27% wasted compared to 31%, 33% and 22% in male child respectively. A significant higher proportion of underweight was found in girls belonging to Muslim religion, OBC category, nuclear family, illiterate unemployed mother and low income. **Conclusion:** The girl child suffers from malnutrition more in the urban areas than rural area

**Key Words**

Nutritional Status; under five

**Introductions**

Under nutrition is a serious public health problem among children in the developing countries (1). Child under nutrition is one of the measures of health status that the World Health Organization (WHO) recommends for equity in health (2).It has been estimated this approximately 70% of the world's undernourished children live in Asia, giving that region the highest concentration of worldwide childhood under nutrition (3). Moreover, India

shows the highest occurrence of childhood under nutrition in the world and it has been estimated that more than half of Indian children are undernourished (4, 5).

Malnutrition impedes motor, sensory, cognitive and social development, so malnourished children will be less likely to benefit from schooling, and will consequently have lower income as adults. The most damaging effects of under-nutrition occur during pregnancy and the first two years of a child's life and

these damages are irreversible (6).Discriminations, whether implicit or explicit, in nutrition and child care have exacerbated the plight of the girl child, which manifests in excess female mortality, as has been highlighted by many studies. Girl child are biologically advantageous than the male child in the perinatal and neonatal period. But this advantage is overridden by the societal practices and discrimination as the child grows. And it is evident from the child sex ratio which decreased from 927 to 914 girl child per 1000 boy child between 2001 and 2011 (7).

**Rationale of the study:** Girls face discrimination from the moment she is born. And this discrimination manifests itself in every walk of life. In other words, they are not reared as equivalent to their male counterpart. The UNICEF intergenerational cycle of malnutrition stresses on the fact that the problem of malnutrition spans generation starting from a undernourished mother giving birth to a low birth weight infant who grows up to be a underweight child and an anaemic and undernourished adolescent and then a mother and the vicious cycle continues. Though the importance of girl child has been stressed time and again, yet a wide level of disparity still exists both in the rural and urban areas. Different underlying factors are responsible for this disparity in the rural and urban areas. Achieving gender equity is one of the main cornerstones for achieving universal health coverage. Therefore this study is conducted to document the gender disparity in nutritional status and compare rural and urban differences.

### Aims & Objectives

1. To compare the gender disparity in nutritional status in children aged 0-5 years in rural and urban areas.
2. To assess the different socio-demographic factors influencing the gender disparity.

### Material and Methods

**Study Design:** Community based cross-sectional study. **Study Area:** The present study has been carried out in the Rani Community Development Block and Guwahati Municipal Ward, Kamrup District, Assam. **Study Population:** Children in the age group of 0-5 years. **Study Period:** 1 year (August 2013-July 2014). **Inclusion Criteria:** Children in the age group of 0-5 years, Residing for 1 year. **Exclusion Criteria:** Children diagnosed with serious medical condition. **Sample Size and Sampling Design:**

According to NFHS-3, the proportion of underweight in Assam was 40.4%.For comparative analysis and in the absence of the availability of similar studies, the sample size was calculated assuming the difference in percentage of underweight in the boy and girl child as 20%. Using the EPI Info software, with prevalence of underweight as 40.4% in males, with a difference of 20% on either side, for 95% confidence interval and 80% power, the sample size calculated was 97 in each group i.e. 97 boys and 97 girls from both rural and urban areas. Hence, a total sample size of 388.

These sample was collected from the Rani Community Development Block (Kamrup Rural) and Guwahati Municipal ward (Kamrup Urban).10 Municipal wards were selected by simple random sampling from the list of 31 wards and 10 boys and 10 girls were taken from each ward. Similarly 10 villages under Rani Community Development Block were selected from 96 villages and 10 boys and 10 girls were selected from each village. Hence the final sample size comes to 400.**Data Collection Tools:** Pre-designed and pre-tested schedule, Infantometer, Salter's type hanging scale, weighing scale and measuring tape. Anthropometric measurements which consisted of measurement of height and weight. **Data Collection Technique:** House to house visit, examination and interview method. **Data Analysis:** Data analysis was done using SPSS v16. **Ethical Considerations:** The Institutional Ethics Committee of Gauhati Medical College approved the study protocol. The consent form was signed by the mother.

**Methods of measurements: LENGTH/ HEIGHT:** Height was measured using a measuring tape. The participants were asked to remove their footwear (shoes, slippers, sandals, etc.) and head gear (hair bows, ribbons etc.), the participants were told to stand with feet together, heels against the wall, knees straight, to look straight ahead and not tilt their head up. It was made sure eyes were the same level as the ears (Frankfurt plane).A cardboard was gradually brought down and the measurement was read to the nearest 0.1 cm. For children less than 2 years, recumbent length was measured with an infantometer. **WEIGHT:** In weighing the children less than 2 years, they were put in weighing pants and hanged gently on the hook of the Salter's hanging weighing scale, which was already hanging on a firm support. The beam was properly balanced and moved freely when at rest and pointer was on zero. The footwear were removed and weighted with

minimal clothing. The scale was then read at the eye level and recorded using a pencil. The result was recorded only after the beam reaches its balance point or pointer becomes motionless. For restless children where it was difficult to get the balance point, **Double Weighing (with standard weighing machine)** was done. First the mother was weighted alone and then she was weighted holding her child and the difference was computed. Both the weights were recorded before doing subtraction. For children aged 2-5 years weight was recorded with the help of a weighing machine (bathroom type). Weight measurement was recorded nearest to 100 gm.

## Results

[Table 1](#) shows the distribution of respondents in rural and urban area according to various socio-demographic factors. Most of the respondents in both urban (43.5%) and rural (54%) area belonged to the age group of 21-25 years.

Majority of the respondents in rural (58%) belonged to joint family and urban (53.5%) area had nuclear family. 97% of respondents in rural were Hindu by religion followed by Christians (3%), whereas, 68.5% were Hindu in urban area followed by Muslims (29.5%).

84.5% of respondents belonged to Scheduled Tribe in rural area and 52% belonged to OBC in urban area. Majority of respondents in both urban (75.5%) and rural (81.5%) area were literate.

Majority of the respondents were homemaker in both rural (95%) and urban (75%) area and were unemployed. The rest were employed as daily wage earner, teacher and others. Most of the respondents in rural areas belonged to Class IV (22.5%) and in urban area to Class V (38.5%).

In [Table 2](#) Most of the children in rural and urban area belonged to the age group of 12-23 months.

Most (60%) of the male child in rural area belonged to second or higher birth order, whereas, in urban area both male (76%) and female child (52%) were first-born.

In [Table 3](#) the prevalence of underweight in rural areas was 31% and 39.5% in urban areas. 32% of male were underweight in rural areas compared to 30% of female. In urban areas 48% of female child were underweight compared to 31% male child. The association between underweight and gender was found to be statistically significant ( $p= 0.020$ ) in urban areas.

The prevalence of stunting in rural areas was 29% and 36% in urban areas. 28% of male were stunted in rural areas compared to 30% of female. In urban areas 39% of female child were stunted compared to 33% male child. The association between stunting and gender was not found to be statistically significant in both rural and urban areas.

The prevalence of wasting in rural area was 15.5% and 24.5% in urban areas. 19% of male were wasted in rural areas compared to 12% of female. In urban areas 27% of female child were wasted compared to 22% male child. The association between wasting and gender was not found to be statistically significant in both rural and urban areas.

In [Table 3](#), it was seen that only the association between underweight and gender was found to be statistically significant ( $p= 0.020$ ) in urban areas. So, in the [Table 4](#), the various socio-demographic factor influencing the gender disparity was analysed.

It was seen that Muslim respondents had more underweight girl child and the association between gender and underweight was found to be highly significant,  $p=0.000$  in the Muslim respondents. Similarly, respondents belonging to OBC caste and nuclear family also had more underweight girl child and the association was found to be statistically significant,  $p=0.000$ . Illiterate mother and unemployed mother had more underweight girl child compared to underweight boy child and the association was statistically significant,  $p=0.023$  and  $p=0.001$  respectively. Respondents with income < Rs 4700 had more underweight girl child. The association between underweight and gender according to birth order was not found to be statistically significant.

## Discussion

Nutritional status is a major determinant of health and well-being in children. The present study found that the prevalence of malnutrition was more in the urban areas as compared to the rural areas. This is in contrast to NFHS-III, where, an estimated 35.8% of 0-3 year old children in Assam were underweight (low weight for age); with strong rural (36.7) urban (27.9) differences. (8) This finding in the study could be attributed to the tribal culture of the rural population and influence of the matriarchal culture of the neighboring state of Meghalaya.

The disadvantage of the girl child is evident by the higher rates of malnutrition in the urban areas. This is similar to other studies done in different parts of

India by various researchers like Dey and Chaudhuri in West Bengal (9), Bhalani and Kotecha in Vadodara (10), Dasgupta in Punjab (11) and Chen et al. in Bangladesh (12).

However, in rural areas, the male child had higher rates of underweight and stunting as compared to the female child. This is similar to other studies done in North-East India by Singh and Mondal (13), Basu et al and others (14)

There was a significant association between underweight and gender in Muslim religion, OBC caste, nuclear family, illiterate and unemployed mother and lower income. Other studies done by Barooah found education to play a key role in the reduction of discrimination against girls in nutrient allocation (15)

No significant relationship could be established with birth order. This is in contrast to studies by Mehrotra; Mishra, Roy & Retherford and Gillespie (16-17).

### Conclusion

The present study found the prevalence of undernutrition more in the urban areas. The girl child had higher rates of undernutrition in the urban areas. In rural areas, the male child had higher rates of underweight and stunting. There was a significant association between underweight and gender in Muslim religion, OBC caste, nuclear family, illiterate and unemployed mother and lower income group. No significant relationship could be established with birth order.

### Recommendation

- Percolating the message of gender equality deep into the community through IEC and empowerment of females in the society.
- Special focus on creating awareness on gender equality in the minority communities and backward castes.
- Intense awareness generation through mass media approach, stressing on female literacy, improving the overall socioeconomic conditions through various income generation schemes.

### Relevance of the study

Gender equity is an important determinant to curb the menace of undernutrition. Though the problem of gender disparity is not as prevalent in Assam as other part of India yet its existence can't be totally ignored. Different underlying factors play their part in the manifestation of gender discrimination. Until

and unless steps are taken to deal with the social determinants of undernutrition its burden can't be lessened.

### Authors Contribution

All authors have equally contributed in the study.

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**Tables**

**TABLE 1 TABLE SHOWING THE DISTRIBUTION OF RESPONDENTS ACCORDING TO SOCIO-DEMOGRAPHIC FACTORS**

SOCIO-DEMOGRAPHIC FACTORS		AREA OF RESIDENCE			
		RURAL(N=200)		URBAN(N=200)	
		No.	%	No.	%
AGE (IN YEARS)	16-20	27	13.5	28	14
	21-25	108	54	87	43.5
	26-30	58	29	82	41
	31-35	6	3	2	1
	36-40	1	0.5	1	0.5
FAMILY TYPE	Nuclear	84	42	107	53.5
	Joint	116	58	93	46.5
RELIGION	Hindu	194	97	137	68.5
	Muslim	0	0	59	29.5
	Christian	6	3	4	2
CASTE	General	0	0	59	29.5
	SC	17	8.5	13	6.5
	ST	169	84.5	24	12
	OBC	14	7	104	52
EDUCATION	ILLITERATE	37	18.5	49	24.5
	LITERATE	163	81.5	151	75.5
OCCUPATION	EMPLOYED	10	5	50	25
	UNEMPLOYED	190	95	150	75
INCOME*	I	28	14	58	29
	II	34	17	29	19.5
	III	41	20.5	14	7
	IV	43	22.5	24	12
	V	14	7	75	38.5

(\* Updated BG Prasad Classification 2012)

**TABLE 2 TABLE SHOWING THE DISTRIBUTION OF THE CHILDREN ACCORDING TO AGE AND BIRTH ORDER**

Variable		Area of Residence							
		Rural				Urban			
		Male(N=100)		Female(N=100)		Male(N=100)		Female(N=100)	
		No.	%	No.	%	No.	%	No.	%
Age (in months)	0-11	7	7	6	6	5	5	5	5
	12-23	40	40	33	33	39	39	41	41
	24-35	38	38	30	30	16	16	24	24
	36-47	8	8	15	15	31	31	23	23
	48-60	7	7	16	16	9	9	7	7
	Total	100	100	100	100	100	100	100	100
Birth Order	1	40	40	50	50	76	76	52	52
	≥ 2	60	60	50	50	24	24	48	48
	Total	100	100	100	100	100	100	100	100

**TABLE 3 TABLE SHOWING THE DISTRIBUTION OF UNDERWEIGHT, STUNTING AND WASTING IN CHILDREN AGED 1-5 YEARS IN RURAL AND URBAN AREA:**

Nutritional Status	Area of residence									
	Rural					Urban				
	Male(n=100)		Female(n=100)		Total	Male(n=100)		Female(n=100)		Total
No.	%	No.	%	No.		%	No.	%		
<b>Weight for age*</b>	$\chi^2 = 0.094, df = 1, p = 0.760$					$\chi^2 = 5.380, df = 1, p = 0.020$				
<-2 SD	32	32	30	30	62(31%)	31	31	48	48	79(39.5%)
>-2 SD	68	68	70	70	138(69%)	69	69	52	52	121(60.5%)
<b>Height for age*</b>	$\chi^2 = 0.097, df = 1, p = 0.755$					$\chi^2 = 0.781, df = 1, p = 0.377$				
<-2 SD	28	28	30	30	58(29%)	33	33	39	39	72(36%)
>-2 SD	72	72	70	70	142(71%)	67	67	61	61	128(64%)
<b>Weight for height*</b>	$\chi^2 = 1.871, df = 1, p = 0.171$					$\chi^2 = 0.676, df = 1, p = 0.411$				
<-2 SD	19	19	12	12	31(15.5%)	22	22	27	27	49(24.5%)
>-2 SD	81	81	88	88	169(84.5%)	78	78	73	73	151(75.5%)

(\* Z score of WHO Child Growth standard was used)

**TABLE 4 SOCIO-DEMOGRAPHIC FACTORS RELATED TO GENDER DISPARITY IN UNDERWEIGHT CHILDREN IN URBAN AREA**

Socio-Demographic factors	Underweight children				
		Male	Female	$\chi^2$ (df)	P value
Religion	Hindu	25	26	0.023	0.879
	Muslim	5	21	20.686	0.000
	Christian	1	1	1.333	0.248
Caste	General	17	4	3.207	0.073
	OBC	6	33	18.531	0.000
	SC	1	2	1.311	0.252
	ST	7	9	0.800	0.371
Family Type	Nuclear	8	27	12.340	0.000
	Joint	23	21	0.030	0.863
Education of mother	Illiterate	3	25	5.168	0.023
	Literate	28	23	0.519	0.471
Occupation of mother	Employed	14	3	1.872	0.171
	Unemployed	17	45	10.900	0.001
Birth Order	1	24	24	2.338	0.126
	≥ 2	7	24	3.541	0.060
Income	≥ 4700	5	3	0.095	0.758
	< 4700	16	45	8.613	0.003