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Nutrition Status Assessment of Preschool Children at Rural Sectors of Bishnupur Municipality, Bankura District, West Bengal, India

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Abstract:

To assess the overall nutritional status of hearing impaired pre-school children of Bishnupur municipality, Bankura district, West Bengal, India this cross sectional study was conducted for duration of eight months (March 2013 to October, 2013) at local community in the rural areas of Bishnupur Municipality, Bankura district, West Bengal. The study samples were selected by multi stage cluster sampling method. The level of stunting, underweight and wasting was assessed using standard deviation (SD) classification as against National Centre for Health Statistics (NCHS) reference standards. This study comprises of 400 (boys=205, girls=195) pre-school children age between 2-5 years to assess the prevalence of underweight, stunting and wasting. Our findings focused that the preschool children of the study area are being suffering from stunting, wasting and underweight as the rate of undernutrition at preschool age groups is significantly higher than NCHC standard data. So, this study established very high rates of malnutrition in the form of underweight, stunting and wasting. An effective public health strategy should be implicated by the Government to prevent malnutrition among the vulnerable pre-school children of remote villages of Bishnupur municipality of Bankura district.

Keywords: Malnutrition, Pre-school Children, Stunting, Underweight, Wasting, WHO

1. Introduction

Among preschool children malnutrition is an important public health issue in the rural sectors of India including West Bengal (Mustaphi and Dobe, 2000). It is a disorder that results from the interaction between diet and infection. Infants and children are the most susceptible because of their high nutritional needs for physical growth and development (Blössner and de Onis, 2005). In developing countries like India this situation is more prominent as people suffer from food insecurity and poverty as they are mainly from lower socio-economic status. Physical growth is mainly used to assess adequate health, nutrition and development of an individual child (WHO, 1995). In concern to monitoring of child growth and development, the internationally recommended anthropometric indicators are - (1) child stunting (low height for chronological age) reflects a sub-standard level of linear growth, an indicator of chronic undernutrition due prolonging food deprivation and/or disease or illness (2) child underweight (low body weight for chronological age) is used as a composite indicator to reflect both acute and chronic undernutrition and (3) child wasting (low weight for relative height) used as an indicator of acute undernutrition with special reference to more recent food deprivation or illness (Reinhard and Wijayaratne, 2002).

As there is paucity of published literature on nutritional status of preschool children of Bishnipur, Bankura district present study was carried out to assess the overall nutritional status as well as growth and development pattern of preschool children in the target area of Bankura district.

2. Materials and Methods

The cross sectional study for anthropometric survey was conducted on preschool children of local community people having the age of 2⁺ to 5⁺ years at remote villages of Bishnupore municipality from March 2013 to October, 2013. Bishnupur is a town and a municipality in Bankura District in the state of West Bengal, India. Bishnupur is located at 23°05'N 87°19'E. It has an average elevation of 59 metres (Dasgupta et al., 2009).

The study children were selected randomly from 20 clusters and 20 children from each cluster were included and a total of 400 children (Boys 205 and Girls 195) were covered in this survey study. Data on age, sex, height and weight were recorded on a pre-tested proforma by door to door visit following interview and examination. The age of the subject was further confirmed from official records. Parents were informed about the objectives of the study and their consent was obtained prior the survey work. For the conduction of this study the permission was collected from our Institutional Ethical Committee.

Data on anthropometric measurements i.e. height in cm and weight in kg were recorded by anthropometer rod and by digital weighing machines respectively following the standard protocol (Hamill et al. 1979). Using standard deviation (SD) classification based on weight-for-age (underweight) height-for-age (stunting) and weight-for-height (wasting) for different age groups the level of undernutrition was assessed (Banerje and Mondal, 2005). For the gradation of above said undernutrition status, Mean \pm 1SD, >1SD- <2SD, >2SD- <3SD and >3SD values were adopted as per guideline of WHO (WHO 2000). Weights as well as heights of the beneficiaries were compared with NCHS (National Center for Health Statistics) data and the values were analyzed statistically (IIPS and NFHS, 2008).

3. Results

Number of boys and girls with different age groups included in this study are presented in Fig. 1. The sex wise distribution pattern of weight and height of relevant age groups have been displayed in Table 1 and Table 2 respectively and the concerned values have been compared with reference values. To find out significant difference in respective values Student two tail 't' test has also been conducted. It has been noted that in case of weight of all the age groups in boys and girls, the observed values were significantly ($p < 0.05$) less than reference value of NCHS. For boys height in the age group of 2⁺ to 5⁺ years was significantly lower than concern NCHS reference values and in case of girls the comparison of height with the reference values for 2⁺ and 4⁺ years of age groups similar findings i.e. significantly less ($p < 0.05$) has been observed. Table 3 and Table 4 showed the percentage of stunting of boys and girls of 2+ to 5+ years age group where more than 80% boys and girls are also suffering from stunting. Table 5 and Table 6 indicated the percentage of different grades of underweight of boys and girls belong to preschool age i.e. 2+ to 5+ yrs. In both the sexes the percentage of above types of undernutrition in critical nature is noticeable where total % of underweight more than 80% in both the cases. Table 7 and Table 8 highlighted the different levels of undernutrition in the form of wasting of boys and girls at the pre-school stage where more 70% are suffering from wasting in both the sexes.

4. Discussion

Undernutrition is a major public health problem in rural areas of developing countries that results ill health of the preschool children. Anthropometric data i.e. height and weight of boys and girls from 2⁺ to 5⁺ years age group were recorded for the evaluation of undernutrition, which were used for the analysis of nutritional status assessment (Bisai et al., 2012). In rural areas of West Bengal though several child development program like ICDS is running but programmes on malnutrition is limited and it has been revealed from earlier reports that presently the prevalence of malnutrition among the children is increasing (Gur et al., 2005). Though these child development programmes provide regular supplementary diet to the different age groups of preschool children but our report focus that they are being suffering from stunting, wasting and underweight (Rao et al., 2005).

Prevalence of stunting among rural preschool children in India varies from 35.1% to 67.8% (Bisai and Mallick, 2011). The prevalence of stunting in our findings also indicated the same.

In India, the prevalence of underweight among tribal preschool children ranged from 37.4% to 93.9% (Bisai and Mallick, 2011). To overcome the undernutrition status in rural sectors of developing countries remedial programmes are going on but report of other researcher indicated that the rate of undernutrition at preschool age groups is significantly higher than NCHC standard data (Nuruddin et al., 2009). It is similar to our present findings confirmed from the prevalence of underweight boys and girls at our study area.

The prevalence of wasting among rural preschool children in India ranged between 13.4% and 85.6% (Bisai and Mallick, 2011). The prevalence of wasting in our present study also strongly supported the fact.

From our study the nutritional status of the studied children were found unsatisfactory. Girls were more prone to have undernutrition than boys. The severity of malnutrition i.e. the rate of underweight, stunting and wasting was very high, indicating a critical situation. Therefore, Government should take effective public health strategy to overcome pre-school child malnutrition among socio-economically poor communities in rural areas of India.

5. References

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Annexure

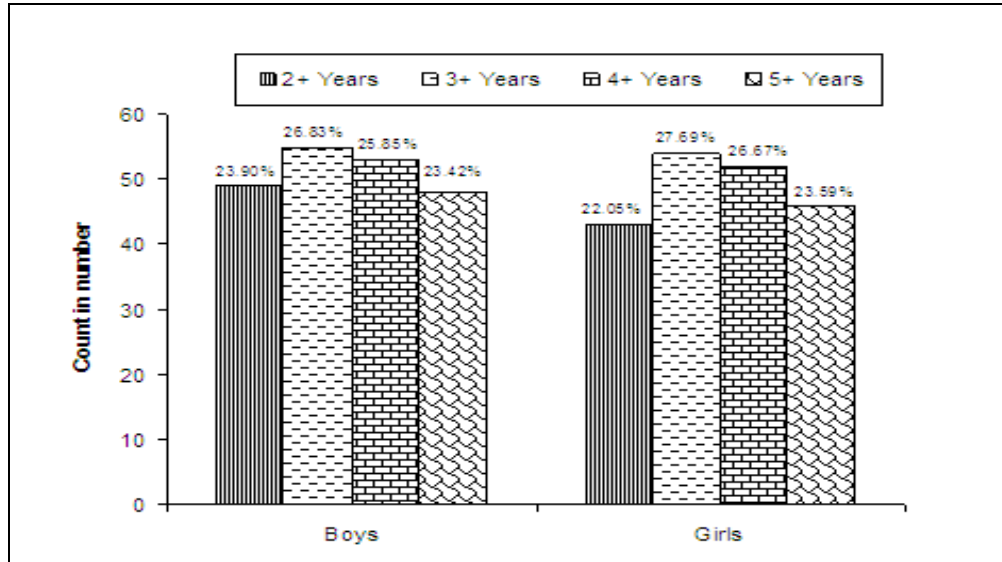


Figure 1: Distribution pattern of preschool children (Total Boys= 205 and Total Girls= 195) in variation with age and sex.

Age group (year)	Boys (weight in Kg)			Girls (weight in Kg)		
	Observed value	Reference value	P-value	Observed Value	Reference value	P-value
2+	9.72±0.13	12.3	<0.05	9.42±0.19	11.8	<0.05
3+	11.61±0.11	14.6	<0.01	12.18±0.13	14.4	<0.05
4+	14.4±0.16	16.7	<0.05	8.65±0.17	16.0	<0.01
5+	14.71±0.21	18.7	<0.01	13.94±0.21	17.7	<0.01

Table 1: Body weight (Kg) of different age groups (2+ to 5+ yrs) in both sexes and their comparative analysis with reference values as per NCHS. In each vertical column values are expressed as Mean ± SEM and Student two-tail ‘t’- test is applied for comparison.

Age group (year)	Boys (height in cm.)			Girls (height in cm.)		
	Observed value	Reference Value	P Value	Observed value	Reference Value	P-Value
2+	73.23±1.91	85.4	<0.001	75.23±2.81	84.5	<0.01
3+	83.71±0.73	94.9	<0.01	86.12±1.70	93.9	<0.001
4+	96.41±1.87	102.9	<0.001	93.29±1.73	101.6	<0.05
5+	94.84±1.15	109.9	<0.01	98.98±0.84	108.4	<0.01

Table 2: Height (cm) of boys and girls in the age group of 2+ to 5+ years. A comparative analysis with reference values of NCHS. In each vertical column values are expressed as Mean ± SEM and Student two-tail ‘t’- test is applied for comparison.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (≥1SD to <2SD)	Serious (%) (≥2SD to ≤3SD)	Critical (%) (>3SD)	Total % of stunting
2+(N=49)	13	14	23	50	88
3+(N=55)	15	15	21	49	85
4+(N=53)	13	19	20	48	87
5+(N=48)	18	17	13	52	82

Table 3: Different levels of stunting of boys subjects at the age group of 2+ to 5+ yrs in our study area on the basis of Mean ± 1SD, ≥1SD- <2SD, ≥2SD–≤3SD and >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (≥1SD to <2SD)	Serious (%) (≥2SD to ≤3SD)	Critical (%) (>3SD)	Total % of stunting
2+(N=43)	11	16	21	52	89
3+(N=54)	13	14	18	55	87
4+(N= 52)	16	19	21	44	84
5+(N=46)	12	16	22	50	88

Table 4: Stunting levels of girls at the age group of 2+ to 5+ yrs on the basis of Mean ± 1SD, ≥1SD- <2SD, ≥2SD–≤3SD and >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (≥1SD to <2SD)	Serious (%) (≥2SD to ≤3SD)	Critical (%) (>3SD)	Total % of underweight
2+(N=49)	19	11	23	47	81
3+(N=55)	18	20	26	36	82
4+(N=53)	16	24	23	37	84
5+(N=48)	15	18	18	49	85

Table 5: Percentage of different categories of underweights boys at the age group of 2+ to 5+ yrs on the basis of Mean ± 1SD, ≥1SD- <2SD, ≥2SD-≤3SD and >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (≥1SD to < 2SD)	Serious (%) (≥2SD to ≤3SD)	Critical (%) (>3SD)	Total % of underweight
2+(N=43)	11	25	29	35	89
3+(N=54)	15	27	22	36	85
4+(N= 52)	18	22	20	40	82
5+(N=46)	16	20	22	42	84

Table 6: Different levels of underweight girls having age between 2+ to 5+ yrs on the basis of Mean ± 1SD, ≥1SD- <2SD, ≥2SD-≤3SD and >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (≥1SD to < 2SD)	Serious (%) (≥2SD to ≤3SD)	Critical (%) (>3SD)	Total % of wasting
2+(N=49)	14	17	28	41	86
3+(N=55)	20	26	17	37	80
4+(N=53)	24	20	23	33	76
5+(N=48)	17	21	23	39	83

Table 7: Percentage of different levels of wasting in preschool boys in study area on the basis of Mean ± 1SD, ≥1SD- <2SD, ≥2SD-≤3SD and >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (≥1SD to <2SD)	Serious (%) (≥2SD to ≤3SD)	Critical (%) (>3SD)	Total % of wasting
2+(N=43)	11	24	27	38	89
3+(N=54)	24	19	22	35	76
4+(N= 52)	23	20	23	34	77
5+(N=46)	26	23	22	29	74

Table 8: Different grades of wasting among preschool girls on the basis of Mean ± 1SD, ≥1SD- <2SD, ≥2SD-≤3SD and >3SD.