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RESEARCH ARTICLE

Impact of Integrated Child Development Services (ICDS) on Growth and Development of Pre-School Children at Peri-Urban and Rural Sectors of Purba and Paschim Medinipore Districts, West Bengal: A Critical Analysis

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Abstract

Present study focuses the nutritional status of beneficiaries of preschool children at different blocks of Purba and Paschim Medinipore districts, West Bengal. Nutritional status was assessed using the anthropometric biosensors along with protein and calorie provided through ICDS meal to the subjects. Through this food, ½ of daily protein and ⅓ of daily calorie are not provided to the beneficiaries and they are suffering from stunting, wasting and underweight. So, the supplementary food is unable to upgrade the growth and development of the children.

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Introduction

Undernutrition among preschool children is an important public health issue in the rural sectors of Indian studied by Saxena et al. (1997), Yadav and Singh (1999), Rajaram et al. (2003), Dolla et al.,(2005), Ray (2005), including West Bengal as per reported by Mustaphi and Dobe, (2000). Integrated Child Development Services (ICDS) scheme has been implemented in different states of our country including West Bengal to challenge the undernutrition of beneficiaries including pre school children, pregnant and lactating mother and other women in the age group of 15 to 44 years as per mentioned by Kapil and Pradhan (1990). Services like supplementary nutrition, immunization, health check-up; referral services, nutrition and health education etc are provided to the beneficiaries through ICDS as reported by Kapil and Pradhan (1990). The impact of services provided through the scheme especially on growth and development of preschool children of ICDS centers are evaluated that further facilitate the acceptability of the services in our community or modification require if any. From literature review it has been noted that there are scanty of information in this line according to Renu, and Rekha (1982) and Bedi (2001)

In concern to monitoring of child growth and development, the internationally recommended indicators are child stunting (low height for age), underweight (low weight for age) and wasting (low weight for height) studied by Reinhard and Wijayaratne (2002), and Samba et al. (2008). Stunting reflects a sub-standard level of linear growth, and is considering as an indicator of chronic undernutrition due prolonging food deprivation and / or disease or illness. Underweight focuses low body weight mass relative to chronological age, which is used as a composite indicator to reflect both acute and chronic undernutrition. Reinhard and Wijayaratne (2002) showed that wasting is influenced by child's weight for height and it is used as an indicator of acute undernutrition with special reference to more recent food deprivation or illness.

On the above background, the present survey work has been conducted to find out the impact of ICDS on growth and development of preschool children at different centers of Purba and Paschim Medinipore Districts, West Bengal,

India. In addition, an attempt has been undertaken to assess the levels of stunting, underweight and wasting in the target group of Bengalee ethnicity at our study area.

1. Materials and Methods

The anthropometric survey was conducted on preschool children having the age of 2⁺ to 5⁺ years at remote villages under Haldia, Mahisadal, Tamluk, Rasulpur, Ramnagar-I Blocks in Purba Midnapore district and Garhbeta, Lalgah, Ghatal, Sabang, Belda, Binpur Blocks in Paschim Mednipore district, West Bengal that covered 75 ICDS centers. The programme was conducted from November 2007 to December 2008. A total of 6440 children (Boys 3252 and Girls 3188) were covered in this survey study. These ICDS centers are located at remote areas which are 40 to 60 Km away from the district town. The children were selected in this study those who attend ICDS centers regularly for at least 1 year and maximum for 5 years. The age and ethnic group (Bengalee) of the subject were confirmed from official records. For the conduction of this study the permission was collected from our 'Institutional Ethical Committee' as well as from ICDS Authorities. ICDS centers provides prepared food 5 days/week in the form of porridge consisting of rice 50 gm, potato 40 gm, soyabean 10 gm, pumpkin 10 gm, spinach 10 gm and papaya 10 gm per head in average in different age groups. One egg is provided to the beneficiaries per head per week.

Height in cm and weight in Kg were recorded by anthropometer rod and by weighing machines respectively following the standard protocol (Hamill et al., 1979). Mean weight as well as height along with standard error of mean (SEM) for different age groups were computed. Sex wise and age wise data were compared with reference value for statistical analysis.

Weights as well as heights of the beneficiaries were compared with NCHS (National Center for Health Statistics) data and the values were analyzed statistically. For the assessment of wasting, stunting and underweight, the table of WHO has been used here (WHO, 1995). 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). After such grouping, age group wise prevalence rate in percentage of wasting, stunting and underweight were presented.

For the nutritional support through ICDS to the beneficiaries, the supplement food was analyzed. This was conducted for seven days and the average values of protein and calories were computed. The derived values were compared with reference values i.e. half protein and one third calorie of daily requirement.

Results

Number of boys and girls in different age groups included in this study were presented in **Table-1**

Table 1: Distribution pattern of preschool children in variation with age and sex in study area

Age (year)	Boys	% of boys	Girls	% of girls	Total
2+	1005	31	995	31	2000
3+	1093	34	1057	33	2150
4+	600	18	590	19	1190
5+	554	17	546	17	1100
Total	3252		3188		6440

Table 2 and 3 represents the Mean weight and height of different age groups with their SEM in sex wise. The concerned values were compared with reference values. Student two tail 't' test was conducted to find out significant difference in respective values. It has been noted that in case of weight of all the age groups in boys and girls, the observed values were significantly less than reference value of NCHS except the 4⁺ age group which differ significantly (P<0.05) from the reference value. Height for boys in the age groups of 2⁺ and 4⁺ were significantly lower than concern NCHS reference values, but there was no significant difference when observed values were compared with reference values of age group 3⁺ and 5⁺ years. In case of girls, the heights of 2⁺ and 4⁺ age group were significantly less than the reference values but for other age groups significant (P<0.05) difference was noted in these parameters in respect to reference value.

Table 2: Weight (Kg) of different age groups (2+ to 5+ yrs) in both sexes and their comparative analysis with reference values as per NCHS. Student two-tail 't' test, values are Mean \pm SEM.

Age group	Boys (weight in Kg)			Girls (weight in Kg)		
	Observed value	Reference value	P-value	Observed Value	Reference value	P-value

2+	9.68±0.15	12.3	<0.05	9.36±0.20	11.8	<0.05
3+	11.94±0.16	14.6	<0.01	12.08±0.17	14.4	<0.05
4+	14.0±0.18	16.7	<0.05	8.97±0.21	16.0	<0.01
5+	14.63±0.19	18.7	<0.01	14.04±0.14	17.7	<0.01

Table 3: Height (cm) of boys and girls in the age group of 2⁺ to 5⁺ years. A comparative analysis with reference values of NCHS. Student two-tail 't'- test, values are Mean ± SEM.

Age group (Year)	Boys (height in cm.)			Girls (height in cm.)		
	Observed value	Reference Value	P Value	Observed value	Reference Value	P-Value
2+	75.06±1.90	85.6	<0.001	78.06±2.14	84.5	<0.01
3+	82.47±0.72	94.9	<0.01	84.04±1.09	93.9	<0.001
4+	96.48±1.93	102.9	<0.001	94.92±1.94	101.6	<0.05
5+	96.84±1.05	109.9	<0.01	99.30±0.74	108.4	<0.01

Table 4: Percentage of different levels of stunting of ICDS beneficiaries at the age group of 2+ to 5+ yrs boys in our study area on the basis of Mean ±1SD, >1SD-< 2SD, >2SD-<3SD, >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (>1SD - <2SD)	Serious (%) (>2SD - <3SD)	Critical (%) (>3SD)	Total % of stunting
2+ (N=1005)	11	16	24	49	89
3+ (N=1093)	14	16	22	48	86
4+ (N= 600)	12	18	21	49	88
5+ (N= 554)	20	16	13	51	80

Table 5: Different levels of stunting of ICDS beneficiaries at the group of 2+ to 5+ yrs girls in our study area on the basis of Mean ±1SD, >1SD-< 2SD, >2SD-<3SD, >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (>1SD - <2SD)	Serious (%) (<2SD - < 3SD)	Critical (%) (>3SD)	Total % of stunting
2+ (N=995)	10	18	21	51	90
3+ (N=1057)	11	15	18	56	89
4+ (N= 590)	16	22	22	40	84
5+ (N= 546)	13	15	23	48	88

Table 4 and 5 focused the percentage of stunting of boys and girls beneficiaries of 2+ to 5+ age group under ICDS scheme where more than 80% boys and girls are also suffering from stunting.

Table 6: Percentage of different categories of under weights of ICDS beneficiaries at the age group of 2+ to 5+ yrs boys in our study area on the basis of Mean ±1SD, >1SD-< 2SD, >2SD-<3SD, >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (>1SD - <2SD)	Serious (%) (>2SD - < 3SD)	Critical (%) (>3SD)	Total % of Underweight
2+ (N=1005)	17	12	24	47	83
3+ (N=1093)	17	21	26	36	83
4+ (N= 600)	15	25	23	37	85
5+ (N= 554)	14	18	20	48.	86

Table 7: Different levels of underweight of ICDS beneficiaries of 2+ to 5+ yrs girls in our study area on the basis of Mean ±1SD, >1SD-< 2SD, >2SD-<3SD, >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (>1SD <2SD)	Serious (%) (>2SD - <3SD)	Critical (%) (>3SD)	Total % of Underweight
2+ (N=995)	10	30	30	30	90
3+ (N=1057)	13	28	23	36	87
4+ (N= 590)	18	21	22	39	82
5+ (N= 546)	16	22	21	41	84

Table 6 and 7 indicated the percentage of different grades of underweight of boys and girls of ICDS beneficiaries belong to preschool age groups of 2+ to 5+ yrs in ICDS scheme. In both the sexes the percentage of above types of undernutrition in critical nature was noticeable where total % of underweight more than 80% in both the cases.

Table 8: Percentage of different levels of wasting of ICDS male beneficiaries in our study area on the basis of Mean ±1SD, >1SD-< 2SD, >2SD-<3SD, >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (>1SD - <2SD)	Serious (%) (>2SD - < 3SD)	Critical (%) (>3SD)	Total % of wasting
2+ (N=1005)	24	16	20	40	76
3+ (N=1093)	24	26	17	33	76
4+ (N= 600)	27	19	24	30	73
5+ (N= 554)	21	20	21	38	79

Table 9: Different grades of wasting of ICDS girls beneficiaries in 2+ to 5+ age groups in our study area on the basis of Mean ±1SD, >1SD-< 2SD, >2SD-<3SD, >3SD.

Age group (year)	Acceptable (%) (Mean±1SD)	Poor (%) (>1SD - <2SD)	Serious (%) (>2SD - <3SD)	Critical (%) (>3SD)	Total % of wasting
2+ (N=995)	17	21	26	36	83
3+ (N=1057)	23	21	18	38	77
4+ (N= 590)	22	21	24	33	78
5+ (N= 546)	22	21	25	32	78

Table 8 and 9 highlighted the different levels of undernutrition in the form of wasting of boys and girls at the pre-school stage under ICDS scheme where more 70% were suffering from wasting in both of the sexes.

Table10: Analysis of protein and energy deficiencies in ICDS supplementary food in comparison to reference value.

Age (Year)	Protein					Energy				
	Daily reference value (gm)	½ of reference value (gm)	Supplied from ICDS meal (gm)	Deficiency (-) / Excess(+)(gm)	% of deficiency (-) / Excess (+)	Daily reference value (kcal)	1/3 of reference value (kcal)	Supplied from ICDS meal (kcal)	Deficiency (-) / Excess (+)(kcal)	% of deficiency (-) / Excess (+)(kcal)
2-3	24	12	8	4(-)	33(-)	1200	400	259	141(-)	35(-)
4-6	30	15	10	5(-)	33(-)	1700	566	300	266(-)	47(-)

Table 10 focused about deficiencies of both protein and energy among ICDS beneficiaries children in compare to standard value.

Discussion

In developing countries like India, undernutrition is a major public health problem that results ill health of the preschool children. For the evaluation of undernutrition of ICDS beneficiaries from 2⁺ to 5⁺ years age group we recorded the anthropometric data i.e. height and weight. These data were used for the analysis of nutritional status assessment through computation of mean \pm SD. At rural sectors of West Bengal, ICDS programme is going on with a target overcome the undernutrition status as several reports indicates that the rate of undernutrition at preschool age groups is significantly higher than NCHS standard data as per report of Rao et al. (2005) and Nuruddin et al. (2009). Though ICDS provides the regular supplementary diet to the different age groups of children but our report focused that preschool age groups of both the sexes are suffering from stunting, wasting and underweight. The chronic undernutrition is detected by stunting as reported by Gur et al. (2005) and here the low level of stunting is very high which is 80-89% of the observed preschool population in our study. For detection of acute undernutrition and illness, wasting is used as an indicator as mentioned by Nandy et al (2005). Here, serious to critical category of wasting was noted in all the preschool age groups. This may be due to deficiency of supplementary food which is served by the ICDS centers of the concern blocks. Underweight is the reflector of acute and chronic type of undernutrition. In our study area the preschool children are also being suffering from poor to critical categories of underweight. From the analysis of the supplied food through ICDS it has been noticed that there is deficiency both in energy and protein in respect to stipulated reference value. Therefore, the deficiency in protein and energy is one of the main causes for the noted underweight, stunting and wasting.

From our results it may be stated that though ICDS centers have been established to challenge the undernutrition at the poor economic sectors or at the need based sectors but the out come is not satisfactory. This may be due to low amount of food supply or unacceptability of the supplied food by the beneficiaries due to monotony. So, one of the main objectives of the ICDS is not fulfilled at our survey area. It may be suggested that government authority should take proper steps for quality up-gradation of the supplementary food to be provided to the beneficiaries by the allotment of more money in this scheme and by introducing variable food items to remove the boredom.

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