Research Article

NUTRITIONAL STATUS OF ANGANWADI CHILDREN OF PHANSIDEWA BLOCK OF DARJEELING DISTRICT OF WEST BENGAL, INDIA

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ABSTRACT: Malnutrition is one of the causes of child's ill health, child mortality and morbidity rate in India. In this study, an attempt was made to find out the nutritional status of children of age group of 1-6 years in the Anganwadi centre and socio demographic profile of the parents' of the children. The cross-sectional study was carried out at Matigara Block of Darjeeling district in West Bengal on March 2016. Anthropometric measurement was taken of 214 children of the 5 randomly selected Anganwadi centres. MUAC of the child was taken between 1 to 5years. A structural questionnaire was used to ask the mother of the children regarding socio economic profile of the parents. The results reveal that by measuring Mid Upper Arm Circumference boys (8.65%) were suffering moderate malnutrition more than the girls (4.55%). Severe wasting was found only in 3-4 years age group. Severe under-weight (33.34%) and severe stunting (30.0%) were highest in the age group of 4-5 years. Boys were also more affected by severe underweight (5.77%) and stunting (6.73%) than girls. Mostly father (66.82%) and mother (63.08%) were educated upto primary to higher secondary. The occupation of 75.23% father were labour and 95.76% mother were either labour or housewife.

Key words: Anganwadi, Children, Anthropometric measurements, Nutritional status, WHO, Z-score.

INTRODUCTION

Malnutrition is a leading contributor of infant and child mortality and morbidity in India (Silva and Silva 2015). Globally over 162 million children under 5 are stunted, 51 million children are wasted and 17 million children are severely wasted (Rubert 2014). Among all the South Asian countries, the rate of stunted and expected to suffer severely wasting is highest in India (Rubert 2014).

It has been estimated that in India 65%, *i.e.,* nearly 80 million children under 5 years of age suffer from varying degrees of malnutrition (Elizabeth, 2010). The 4th National Family Health Survey (NFHS- 4) showed that the under-five mortality rate (U5MR) in India is 32. NFHS-4 reported that the percentage of children under 5 years who are stunted (height-for age) and who are underweight (weight-for-age) are 32.5 and 31.5 respectively. The percentage of children under 5 years who are wasted (weight-for-height) and severely wasted are 20.3 and 6.5 respectively.

In developing country like India under nutrition is the main cause of high rate of child or infant death. Chronic under nutrition in childhood is linked to slower cognitive development and serious health impairments later in life that reduce the quality of life of individuals (Scrimshaw 1996) Nutritional Status is an important index of this quality (Sachdev 1996).

To combat these malnutrition problem, Govt. of India launched Integrated Child Development Services (ICDS) on 2nd October, 1975. Now, it becomes the largest early child development program. In the ICDS centres supplementary food are given to the beneficiary children between 6 month to 6 years and nutritional status of the children has been evaluated to identify the malnourished children.

There are studies done which shows that there is a positive impact of ICDS on child nutritional Status (Alim and Jahan 2012). Singh *et al*. (1993) and Chaini *et al*. (1994) have found positive impact of ICDS on nutritional status (Alim and Jahan 2012).

Emphasizing the significance of positive impact of ICDS on the nutritional status of children, this study was conducted to assess the prevalence of malnutrition

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Table 1. Distribution of Anganwadi children (n=214) according to age and gender.

Age group	Boys	Girls	Total
0-1 year	1	1	2
1-2 year	21	28	49
2-3 year	25	22	47
3-4 year	27	29	56
4-5 year	25	16	41
5-6 year	5	14	19

(underweight, stunting and wasting) in children (1 year to 6 years) of Anganwadi Centres of Phansidewa Block of Darjeeling District of West Bengal State.

MATERIALS AND METHODS
Study Design

This study is a community based cross sectional study. The study was conducted in the Anganwadi centres of Darjeeling District of West Bengal during March 2016.

Selection of Anganwadi centres and children

The study was conducted at Phansidewa Block of Darjeeling District, West Bengal, India. This Block is under Siliguri Sub-division. At present there are 557 operational Anganwadi centres in this block. Among them, 5 centres were selected randomly. Official approval was taken from the District Project Officer (DPO) for collection of data.

Anthropometric measurements (Height, Weight and Mid Upper Arm Circumference) were taken of the enrolled children between 1-6 years of Anganwadi centre who were present at the time data collection. Total 214 children were present. Among them 104 children were boys and 110 were girls. The age of the children was recorded from the Mother and Child Protection Card supplied by the Government.Weight was taken by using digital weighing machine to the nearest 100 gm with minimal clothing and bare foot. The portable scale was checked and calibrated every day using known standard weight.

Height was taken by Height / Length board of UNICEF to the nearest centimetre with bare foot.

The mid upper arm circumference was taken by using MUAC tape of UNICEF to the nearest centimetres.

A structured questionnaire was used to ask the mother of the children to obtain the information about occupation and level and family income.

ANALYSIS OF DATA

The anthropometric indices were calculated using reference medians recommended by the World Health

Table 2. Percentage of under nutrition among Anganwadi Children (n=214) by MUAC for age Z-score.

MUAC for Age Z-score	Boys	Girls
Normal	91.35	95.45
<-2SD	8.65	4.55
<-3SD	0	0

Organization (WHO) and classified according to standard deviation units (z-scores), based on WHO criteria (Olack 2011).

The following indexes of nutritional status was used (WHO 2006), (WHO 2007)

i.Weight for Age (to detect underweight).
ii.Height for Age (to detect stunting).
iii.Weight for Height (to detect wasting).
iv.MUAC for Age (to detect under nutrition).

Weight-for Height z-score (WHZ) <-2 standard deviation (SD) and <-3SD indicate wasting and severe wasting respectively. This is used to detect acute malnutrition which is the result of recent nutritional deficiencies.

Height-for-Age z-score (HAZ) <-2SD and <-3SD are marked as stunting and severe stunting which means chronic malnutrition. This indicate a long period of nutritional deficiency.

Weight-for Age z-score (WAZ) <-2SD and <-3SD indicate underweight and severe underweight, respectively. This is a measure for both acute and chronic malnutrition.

For MUAC <-2SD was considered as moderate malnutrition and <-3SD as severe malnutrition. MUAC was taken between the children of age group of 1-5years.

Above 2 z-score value is considered as normal for each index.

Table3. Socio-demographic profile of parents (n=214).

Parameter	Father (%)	Mother (%)
Education		
Below primary	27.57	35.05
Primary to higher secondary	66.82	63.08
Above higher secondary	5.61	1.87
Occupation		
Labourer (or housewife in case of mother)	75.23	95.76
Business holder	17.76	0.47
Service holder	7.01	3.74
Income		
Lower	5.14	—
Moderate	80.84	—
Higher	14.02	—

Table 4. Prevalence of malnutrition among Anganwadi children according to their age.

Type of Malnutrition	0-1 year	1-2 year	2-3 year	3-4 year	4-5 year	5-6 year	Total
Weight for Height							
Normal	1.15	24.14	22.99	27.01	16.09	8.62	100
Wasting	0	18.42	18.42	18.42	34.21	10.53	100
Severe wasting	0	0	0	100	0	0	100
Weight for Age							
Normal	1.25	25	24.38	25	16.25	8.12	100
Underweight	0	17.78	13.33	31.11	26.67	11.11	100
Severe Underweight	0	11.11	22.22	22.22	33.34	11.11	100
Height for Age							
Normal	1.16	23.84	22.68	25	17.44	9.88	100
Stunting	0	18.75	18.75	34.38	25	3.12	100
Severe Stunting	0	20	20	20	30	10	100
MUAC for Age							
Normal	1.1	25.41	24.86	27.63	21	0	100
MUAC <-2SD	0	21.43	14.29	42.86	21.42	0	100
MUAC <-3SD	0	0	0	0	0	0	0

The educational and occupational level of the parents were divided into three groups. The groups were graded as below-

For Educational level

i.Below Primary

ii.Primary to Higher Secondary

iii.Above Higher Secondary

For Occupational level

i.Labour (or Housewife in case of mother)

ii.Business holder

iii.Service worker

In same way income level of family was also divided into three categories. At first highest and lowest income was identified of the family of the children of that Anganwadi Centre. After that Mean and Standard Deviation (SD) of the total income of all of the family of the children of the centre was calculated and then the income was categorised as below (Snedecor and Cochran 1994).

i.Lower [(Lowest income to (Mean-SD)]

ii.Moderate [more than (Mean-SD) to (Mean+SD)]

iii.Higher [more than (Mean+SD) to Highest income]

RESULTS AND DISCUSSION

Out of 214 children, 104 children (48.60%) were boys and 110 children (54.40%) were girls. Distribution of the children according to their age and sex is presented in the Table 1.

Malnutrition is related with inappropriate eating practice and food security. At Anganwadi centres the Anganwadi workers advice mothers about good feeding practices. The children up to 6 years were provided supplementary foods and they were practised spot feeding. According to the guideline, Anganwadi workers
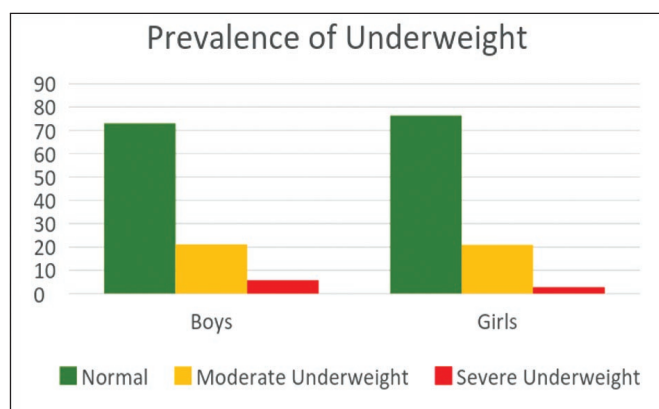

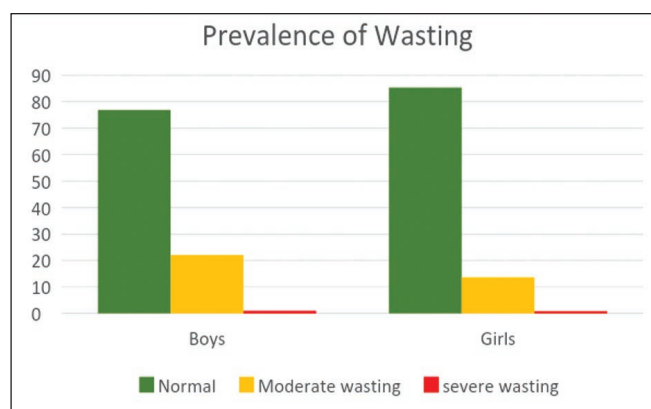**Fig. 1. Prevalence of Underweight among Anganwadi children.**

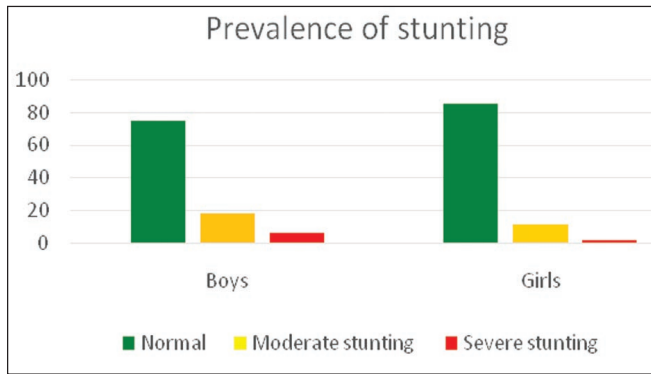**Fig. 2. Prevalence of Wasting among Anganwadi children.**

Fig. 3. Prevalence of Stunting among Anganwadi children.

had to identify the severe malnourished children and supply them double supplementary foods. But, actually the nutritional status of the children was recorded very casually and they do not mark any severe malnourished children. So there was no variation in the amount of foods given. All the children were provided same quality of food.

According to the Z-score of mid upper arm circumference, there was no severe under nutrition. But 4.55% girls and 8.65% boys were affected by moderate level of malnutrition (Table 2). In the age group of 3-4 years, moderate malnutrition is 42.86%. There was no severe malnutrition in respect to MUAC measurement.

There were no significance differences in sex in moderate underweight. But about 2.73% girls were severely underweight. The percentage of severely underweight in boys was more than double of the girls *i.e*. 5.77% (Fig. 1). Among moderate underweight condition, highest was the age group of 3-4 years *i.e.* 31.11% (Table 4). Among severe underweight condition, highest was 4-5 years age group *i.e.* 33.34%. In the 2-3years and 3-4 years separately, severe underweight is 22.22%.

Around 1% of both girl and boy were suffering from severe wasting conditions (Fig. 2).This result is not at per with a study in another block of the same district where severe wasting was observed among 4.35% of boys and 2.0% girls (Sarkar *et al.* 2017). The prevalence of moderate wasting was 22.12% in boys and 13.64% in girls. 34.21% moderate wasting was found in the age group of 4-5 years. Moderate underweight was found 18.42% in the age group of 1-2 years, 2-3 years, and 3-4 years separately.

A difference was found in the percentages of different degree of stunted according to sex. 75% boys and 85.45% girls were normal. 18.27% boys and 11.82% girls were recorded as moderate stunted and 6.73% boys were severely stunted which was approximately three times of girls (2.73%) (Fig. 3). Among moderate stunting 34.38% was in the age group of 3-4 years and 18.75%

were in the age group of 1-2 years and 2-3 years separately. Among severe stunting 30% was in the age group of 4-5 years and 20% was in the age group of 1-2 years, 2-3 years and 3-4 years.

The socio demographic profile of the parents is given in Table 3. Maximum parents of the children had education above primary and up to higher secondary. Only 1.87% mother and 5.61% father had qualification above higher secondary.

95.76% mother were either housewife or labourer. 75.23% and 17.76% father were labourer and businessman, respectively. 7.01% father and 3.74% mother were service holder. 80.84% family has moderate level of income. Only 5.14% family belongs to lower income group.

In conclusion, this study indicated that the nutritional status of the age group of 3-4 years and 4-5 years were serious. Under nutrition and childhood morbidity have a synergistic relationship (Olack 2011). The interrelationship of the two is in such a way that illness can suppress appetite precipitating under nutrition of a child while, on the other hand, nutritional deficiencies increase the susceptibility of the child to infectious disease (Pelletier 1995). Stunting is also a predominant nutritional problem, and the elevated prevalence in the older children indicates failure in growth and development during the first two years of life (Olack 2011).

From all these findings, it can be recommended that the supplementary feeding should be strengthened in the anganwadi with spot feeding technique and Supervisors should monitor the centres regularly.

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REFERENCES

Alim R, Jahan F (2012) Assessment of nutritional status of rural Anganwadi children of Aligarh under the ICDS (Integrated Child Development Services) and rural health. Study Home Com Sci 6(2): 95-98.

Elizabeth KE (2010) Nutrition and child development. Pars Medical Publisher. 4(1): 163.

Olack B, Burhe H, Cosmas L, Bamrah S, Dooling K, Feikin DR, Talley LE, Breiman RF (2011) Nutritional status of under-five-children living in an informal urban settlement in Nairobi, Kenya. J Hlth Populat Nutri 29: 357-363.

Pelletier DL, Frongillo EA Jr, Schroeder DG, Habicht JP (1995) The effects of malnutrition on child mortality in developing countries. Bull World Hlth Org. 73: 443- 448.

Rubert C (2014) Malnutrition in Asia promoted child nutrition in Asia. Ventiane. UNICEF East Asia Pacific Office. Nov: 4 - 6.

Sachdev HPS (1996) Assessing child malnutrition: some basic issues. Nutriti Foundation India. 16(4): 1-5.

Sarkar M, Mandal GP, Prabha S, Baidya P, Badya S (2017) Nutritional status of Anganwadi children of Matigara block of Darjeeling district of West Bengal. Explor Anim Med Res 7(1): 22 - 27.

Scrimshaw NS (1996) Nutrition and health from womb to tomb. Nutri Today 31: 55-56.

Snedecor WG, Cochran WG (1994) Statistical Methods. Oxford and IBH publication. New Delhi, India.

Silva VGP, Silva SGP (2015) Nutritional status of Anganwadi children under the Integrated Child Development Services scheme in a rural area in Goa. Intern J Scientif Study 3(7): 217- 221.

World Health Organization (2006) WHO Multicentre growth reference study group WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva. World Hlth Org. 312.

World Health Organization (2007) WHO multicentre growth reference study group WHO Child Growth Standards: Head circumference-for-age, arm circumference-for-age, triceps skinfold-for-age and subscapular skin_fold-for-age: Methods and development Geneva: World Hlth Org. 217.