Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.2458

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **5 (1):** 942-947 (2017)

Research Article

International Journal of Pure & Applied Bioscience

OPEN ACCESS

Assessment of Anthriopometric Indices of School Going Children of Rural Areas of Dantiwada

Prashant J. Joshi[1*], Namrata G. Khatri[2] and Kandarp R. Chaudhary[3]

[1,2]Department of Food Science and Nutrition, ASPEE College of Home Science and Nutrition,

[3]Department of Veterinary extension education, College of Veterinary Science & A.H., S.D. Agricultural University, Sardarkrushinagar, Gujarat

*Corresponding Author E-mail: dantiwada.bhaskar@gmail.com

Received: 14.01.2017 | Revised: 25.01.2017 | Accepted: 27.01.2017

ABSTRACT

Nutritional deficiencies are more common observed in children belongs to developing countries like India. The under nutrition influence economic productivity through decreases in the scholastic performances, IQ levels, psychological development, cognitive functions and adult size. The present study is to understand the common nutritional disorders/ deficiencies based on assessment of anthropometric indices of school going children of rural areas of Dantiwada Taluka, North Gujarat. The anthropometric survey of 220 school children on the basis of associations of nutritional status with socio-economic status, education status of mothers and family size were carried out and compared against the NCHS/WHO reference standards to evaluate their nutritional status. The prevalence of stunting, wasting and under nutrition was observed as 18.18 %, 80 % and 85.45 %, respectively. The comparative results of associations of nutritional status with socio-economic status, education status of mothers and family size with NCHS/WHO reference standards indicated that most of rural parents don't have enough knowledge of proper child rearing practices and about their children's nutrition requirement. So it is necessary to carry out more on it and studies on the basis of maternal educational status and family size because they are important factors to determining the nutritional status of the child. This would help in improve knowledge level of rural parents and for the improvement of their health status.

Key words: *Nutritional status, School going children, Maternal education.*

INTRODUCTION

Children are dynastic altruism and wealth of every nation. Health of children is dependents on food intake which provides sufficient energy level to body and its nutrients which increase social, physical growth. Nutritional deficiencies are more common observed in children belongs to developing countries like India. According to estimates in developing countries, 57 million under weight children live in India out of world's 146 million[16].

Cite this article: Joshi, P.J., Khatri, N.G. and Chaudhary, K.R., Assessment of Anthriopometric Indices of School Going Children of Rural Areas of Dantiwada, *Int. J. Pure App. Biosci.* **5(1):** 942-947 (2017). doi: http://dx.doi.org/10.18782/2320-7051.2458

In the developing world, 43% of the children are stunted and 9% are wasted[13]. In India, the National Family Health Survey I & II reported that both chronic and acute under nutrition was high in many states[8]. Hence, it is scarcely amazing that one of the millennium development goals (MDGs), approved upon by countries of the world is to reduce the proportion of underweight children by half by the year 2015[2]. The school age is nutritionally crucial due to body's mechanism toward stores of nutrients for preparation of rapid growth of adolescence[9]. The under nutrition influence economic productivity through decreases in the scholastic performances, IQ levels, psychological development, cognitive functions and adult size[7]. It is very important to know the nutritional status of school going children and therefore the present study was carried out in the rural areas of Dantiwada Taluka to assess the nutritional status of 6-10 years school going children and to investigate the prevalence of under nutrition among the selected children.

MATERIAL AND METHODS

The study was carried out in three randomly selected villages of Dantiwada Taluka. The age group of 5-11 years were grouped into class I to VII. Sample size calculated taking alpha error as 5%, p=0.5 and expected deviation was as 4%. 220 school going children out of which 146 boys and 74 girls were taken as a sample. A spring weighing machine was used to measure the body weight to nearest 0.1cm using non-stretchable fibre tape. The individuals were kept with minimum clothing and without shoes. Height was measured in a standing position to the nearest 0.1 cm using non-stretchable fibre tape. Height for age (stunted), weight for height (wasted) and weight for age (underweight) for each child was calculated and compared with the WHO/NCHS standards. Cut off point values between ± 2SD were considered as normal. Age of child was determined using school records. Mother's educational level was classified into six different groups *viz.* Illiterate, Primary (completed class V), Middle school (completed class VIII), High school (completed class X), Intermediate (completed class XII) and Graduate and beyond.

RESULTS AND DISCUSSION

The present study showed a growth in basic parameters of anthropometric measurements *viz.* height and weight and as compared to the reference standards laid down by NCHS/WHO amongst school going children in rural areas of Dantiwada Taluka of North Gujarat.

Distribution of children by age and sex

The data was analyzed with respect to the objectives of the current study which were to find that a total of 220 children were studied belonging to the age group 5 to 11 years. Out of the 220 students, 146 (66.37%) were boys and 74 (33.63%) were girls. Among the 220 children, 30 (13.64%) were belonging to 5+ years age group, 33 (15.00%) were belonging to 6+ years age group, 28 (12.73%) were belonging to 7+ years, 34 (15.45%) were belonging to 8+ years, 31 (14.09%) were belonging to 9+ years age group, 35 (15.91%) were belonging to 10+ years age group and 29 (13.18%) were belonging to 11+ years age group (Table 1).

Table 1 Distribution of children by age and sex

Age group (years)	Female (%)	Male (%)	Total (%)
5+	11 (33.60)	19 (63.33)	30 (13.64)
6+	10 (30.30)	23 (69.70)	33(15.00)
7+	8 (28.57)	20 (71.43)	28(12.73)
8+	13 (38.24)	21 (61.76)	34(15.45)
9+	10 (32.26)	21 (67.74)	31(14.09)
10+	12 (34.29)	23 (65.71)	35(15.91)
11+	10 (34.48)	19 (65.52)	29(13.18)
Total	74 (33.63)	146 (66.37)	220 (100)

Mean weight of the boys and girls

The mean weight of the boys and girls for all the age groups was founded lower than the mean weight of WHO/NCHS standards (Table 2). The mean weight increased from 16.70 kg and 16.30 kg for boys and girls respectively in the 5+ age group to 34.4 kg and 33.29 kg, respectively in the 11+ age group. The mean weight of boys were more than girls till 7+ years age group, thereafter girls weighed more till 9+ years age group. However there was no significant difference observed in the mean weight of the boys and girls in any of the years age groups in the present study.

Table 2 Comparison of the mean weight of the boys and girls

Age group	Boys				Girls			
	Number examined	Mean Weight (kg)	SD	Mean weight (boys) WHO/NCHS standards	Number examined	Mean Weight (kg)	SD	Mean weight (girls) WHO/NCHS standards
5+	19	16.70	2.66	18.90	11	16.30	2.30	18.10
6+	23	19.14	3.10	21.30	10	18.80	3.31	21.00
7+	20	21.90	2.91	24.00	8	20.93	3.89	22.20
8+	21	23.00	3.49	26.40	13	24.61	4.25	26.30
9+	21	25.10	3.84	28.80	10	28.70	3.71	30.80
10+	23	31.70	4.12	33.60	12	29.17	4.18	32.60
11+	19	34.40	4.86	36.90	10	33.29	5.05	37.60

Mean height of the boys and girls

Mean height was founded lower than the mean weight of WHO/NCHS standards in all the age group (Table 3). The mean height of boys and girls in all the age groups were observed as a 105.3 cm and 103.1 cm for 5+ age group, 111.1 cm and 110.8 cm for 6+ age group, 117.5 cm and 115.9 cm for 7+ age group, 122.5 cm and 120.2 cm for 8+ age group, 127.5 cm and 128.0 cm for 9+ age group, 133.1 cm and 134.9 cm for 10+ age group and 139.1 cm and 141.1 cm for 11+ age group, respectively. Result revealed that the mean height of boys was significantly increases up to 9+ year age group, but thereafter the mean height of girls was increases greater than the mean height of boys.

Table 3 Comparison of the mean height of the boys and girls

Age group	Boys				Girls			
	Number examined	Mean height (cm)	SD	Mean height (boys) WHO/NCHS standards	Number examined	Mean height (cm)	SD	Mean height (girls) WHO/NCHS standards
5+	19	105.3	3.60	108.9	11	103.1	7.40	107.9
6+	23	111.1	5.03	116.1	10	110.8	3.79	115.4
7+	20	117.5	5.40	122.6	8	115.9	5.08	120.6
8+	21	122.5	6.20	128.1	13	120.2	6.60	127.4
9+	21	127.5	5.30	131.6	10	128.0	6.30	133.2
10+	23	133.1	4.41	138.1	12	134.9	5.01	138.5
11+	19	139.1	6.69	143.4	10	141.1	7.63	144.00

Prevalence of stunting, wasting and underweight in study group according to WHO/NCHS standards

The results of studies according to WHO/NCHS standards founded that the overall prevalence of stunting in the given study was 14.77 % in 40 respondents (Table 4). The prevalence of stunting was more in boys (15.70%) as compared to girls (22.97%). Among the girls and boys, stunting was prominent in the age group 11 to 12 years with 29.2% in girls and 34% in boys. Total 80% children (176) observed with prevalence of wasting in the present study. The higher

proportion of children with wasting with a prevalence of young children between the ages of 5 to 7 years are more stunted than children between the age of 8 to 9 years and no wasting found in those ≥10 years. The prevalence of underweight was observed in 85.45% children (188). It showed that higher proportions of girls (87.84%) are underweight compared to boys (84.25%). Among the girls underweight was seen more commonly in the age group 11 to 12years and among boys in 6 to 7 year age group. (Table 4).

Table 4 Prevalence of stunting, wasting and underweight in study group according to WHO/NCHS standards

	Stunted			Wasted			Underweight		
	Sever (%)	Moderate (%)	Total (%)	Severe (%)	Moderate (%)	Total (%)	Severe (%)	Moderate (%)	Total (%)
Girls (n=74)	3 (4.05)	14 (18.92)	17 (22.97)	6 (8.11)	53 (71.62)	59 (79.73)	18 (24.33)	47 (63.51)	65 (87.84)
Boys (n=146)	5 (3.42)	18 (12.33)	23 (15.70)	8 (5.48)	109 (74.66)	117 (80.14)	39 (26.71)	84 (57.54)	123 (84.25)
Total (n=220)	8 (3.64)	32 (14.55)	40 (18.18)	14 (6.36)	162 (73.64)	176 (80.00)	57 (25.91)	131 (59.55)	188 (85.45)

Prevalence of stunting, wasting and underweight in study group according to maternal educational status

From these 220 children, the mothers of 1.82 % (4) were graduates and higher then that, 4.55 % (10) had studied till intermediate school, 11.36 % (25) up to high school, 21.36 % (47) up to middle school, 42.27 % (93) mothers were educated up to primary level and 18.64 % (41) mothers were found illiterate. On comparing the homogeneity of distribution of girls and boys according to motherly education status, it was observed that girls and boys were homogeneously dispersed and majority of the mothers were home worker in the present study. The highest prevalence of stunting 37.5% (15) was obtained among children whose mothers were learned up to primary level. Of the 49 children whose mothers were uneducated, 95.12 % (39) had wasting while the lowest prevalence of wasting 50 % (2) was observed in children whose mothers were graduates or post graduates. The prevalence for underweight was least 50 % (2) among children whose mothers were graduates or beyond, while the highest prevalence 92.68 % (32) was observed among the children whose mothers were illiterate. Family size showed statistically significant association with the three nutritional indices of stunting, wasting and underweight (Table 5).

Table 5 Prevalence of stunting, wasting and underweight in study group according to maternal educational status

Mother's Education	**n (%)**	**Stunted (%)**	**Wasted (%)**	**Underweight (%)**
Illiterate	41 (18.64)	9 (21.95)	39 (95.12)	38 (92.68)
Primary	93 (42.27)	15 (16.13)	74 (79.56)	86 (92.47)
Middle School	47 (21.36)	7 (14.89)	37 (78.72)	37 (78.72)
High school	25 (11.36)	5 (20.00)	18 (72.00)	19 (76.00)
Intermediate	10 (04.55)	3 (30.00)	6 (60.00)	6 (60.00)
Graduation and beyond	4 (01.82)	1 (25.00)	2 (50.00)	2 (50.00)
Total	220 (100)	40 (18.18)	176 (80)	188 (100)

Prevalence of stunting, wasting and underweight with respect to family size

When data was analysed according to family size, from that 20.91 % (46) children came from families which had three members, and 18.18 % (40) children were from families with more than five members, however, 60.91% family was observed with 4 to 5 children in their family size. The girls and boys were homogeneously distributed with respect to the family size.

Table 6 Prevalence of stunting, wasting and underweight with respect to family size

Family size (members)	n (%)	Stunted (%)	Wasted (%)	Underweight (%)
3	46 (20.90)	5 (10.87)	20 (43.48)	36 (78.26)
4-5	134 (60.91)	14 (10.45)	119 (88.81)	117 (87.31)
>5	40 (18.18)	21 (52.50)	37 (92.50)	35 (87.5)
Total	220 (100)	40 (18.18)	176 (80)	188 (100)

Our findings are in agreement with that reported by other workers from India[1,3,4,5,6,10,11,12,14,15]. The prevalence of stunting, wasting and underweight was analyzed as a marker of undernutrition and found them present in 18.18% ,80% and 85.45 % of children, respectively. The data analysis of National Family Health Survey (NFHS) 1also indicated that maternal education has a strong independent effect on a child's nutritional status even after overprotective for the potentially impenetrably effects of the 12 other demographic and socioeconomic variables. Moreover improvement in nutritional status with mother's education had also been reported by other workers. In present study, family size showed a strong association with all three indices of malnutrition. NFHS survey also showed that children with three or more older siblings were more likely to suffer chronic malnutrition than children from smaller families.

CONCLUSION

Stunting is a result of long term malnutrition, and is influenced by child concern practices and parental attitudes accumulating over a long period of time. Most rural parents don't have enough awareness of proper child nurture practices and child nutrition. Lower socio economic status of the rural people, maternal education and environmental circumstances influencing over a long period of time could serve for a higher prevalence of stunting among the children. Besides, underweight and wasting reflect an acute phenomenon and do not appear to have any strong relationship with socio economic status of the family. Present study showed that maternal educational status and family size are central factors determining the nutritional status of the child. Hard work towards improvement of female literacy and effort toward the restricting family size will have a positive impact on the nutritional status of the school going children.

REFERENCES

1. Agarwal, D.K., Agarwal, K.N., Upadhay, S.K., Mittal, R., Prakash, R. and Rai, S., Physical and sexual growth pattern of affluent Indian children from 5-18 years of age. *Indian Pediatr*., **29:** 1202-84 ((1992).
2. Agarwal, K.N., Agarwal, D.K., Benakappa, D.G., Gupta, S.M., Khanduja, P.C., Khatua, S.P., Ramachandran, K., Udani, P.M. and Gopalan, C., *Per-formance of Affluent Indian Children (Under Fives): Growth Standard for Indian Children*, Nutrition Foundation of India, New Delhi (1991).
3. Banerjee, A., Height and weight patterns as indicators of growth among school children in an Air Force Station: A cross sectional study. *MJAFI*., **57:** 8-11 (2001).
4. Bhasin, S.K., Singh, S., Kapil, U. and Sood, V.P., Gaur DR. Height and Weight

of 'well to do' school children in Haryana. *Indian Pediatr*., **27:** 1089-93 (1990).

5. Bishnoi, P., Sehgal, S. and Kwatra, A., Anthropometric measurements of preschool children as effected by socio-economic factors. *Asian Pacific J Clinical Nutrition*., **13:** S132 (2004).
6. Gopaldas, T., Patel, P. and Bakshi, M., Selected socio-economic, environmental, maternal, and child factors associated with the nutritional status of infants and toddlers. *Food and Nutrition* Bulletin., **10:** (1998).
7. International Food Policy Research Institute. Nutrition through out the lifecycle. 4th Report on the World Nutrition Situation. Geneva : UN Administrative Committee on Coordination, (2000).
8. International Institute of Population Sciences. National Family Health Survey-2, 1998-99. Mumbai, India: IIPS (2000).
9. Kumari, S. and Jain, R., Assessment of mental and motor abilities of school children from rural Bihar. *Ind. J. Nutr. Dietet*, **42:** 99-105 (2005).
10. Mishra, V.K. and Retherford, R.D., Women's Education can improve Child Nutrition in India. *NFHS Bulletin*., **15:** 7-10 (2000).
11. Mukherjee, M.R., Chaturvedi, C.S., Bhalwar, C.R., Determinants of Nutritional Status of School Children. *MJAFI*., **64:** 227-231 (2008).
12. Panda, P., Benjamin, A.I., Singh, S. and Zachariah, P., Health status of school children in Ludhiana city. *Indian Journal of Community Medicine*, **25:** 150-5 (2000).
13. Park, K., Parks Textbook of Preventive and Social Medicine.18th ed. Jabalpur: Banarasidas Bhanot (2005).
14. Ray, S.K., Biswas, A.K., Gupta, S.D., Mukerjee, D., Kumar, S., Biswas, B. and Joardar, G., Rapid Assessment of nutritional status and dietary pattern in a municipal area. *Indian Journal of Community Medicine*., 7-10 (2000).
15. Shah, S.M., Selwyn, B.J., Luby, S., Merchant, A. and Bano, R., Prevalence and correlates of stunting among children in rural Pakistan. *Pediatrics International*., **45:** 49-53 (2003).
16. UNICEF., Nutritional anemia in South Asia. Malnutrition in South Asia- A Regional Profile. Rosa Publications, pp: 75-83 (1997).