Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 5, Issue, 08, pp.2315-2317, August, 2013

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

ASSESSMENT OF UNDERWEIGHT AMONG ADOLESCENT IN RURAL AREAS OF BANKURA WEST BENGAL, INDIA

[1]Naba Kumar Das and [2]*Gautam Narayan Sarkar

[1]Helna-Susunia M.S. High School, Bankura-722 146, West Bengal
[2]Department of Community Medicine, Bankura Sammilani Medical College and Hospital, Bankura-722 102, West Bengal

ARTICLE INFO

Article History:
Received 07th May, 2013
Received in revised form
14th June, 2013
Accepted 11th July, 2013
Published online 23rd August, 2013

Key words:
Underweight,
Adolescent,
Rural.

ABSTRACT

Objective: The aim of the present study was to determine the prevalence of underweight among adolescent of 11-16 years old using the 2007 WHO Child Growth Standards.
Methods: This cross-sectional study was undertaken among 1879 school going children (939 boys and 940 girls) from rural area of Bankura District, West Bengal. Body weight (Kg) and height (cm) were measured according to standard procedure.
Results: The overall prevalence of underweight was 53.27%. A high prevalence of underweight was found among girls (55.27%) than boys (51.1%). The height frequency of underweight was observed among boys of 12 years (59.39%) and among girls of 13 years (64.33%).
Conclusion: It is concluded that underweight is highly persists among the adolescent in rural area especially in girls. Nutritional intervention is necessary to ameliorate their underweight.

INTRODUCTION

One of the major health problem faced by the developing countries, today is malnutrition (Tanner, 1978; WHO, 1985; UNICEF, 1990). Health and nutritional status are two crucial interlinked aspects of human development, which in turn interact with demographic variables in important ways (Maiti *et al.*, 2011). The primary cause of ill-health and premature mortality among children, in developing countries is endorsed to under nutrition (Nandy *et al*., 2005). In developing countries, it is postulated that poverty and ignorance are primary informal factors of malnutrition (Odunayo & Oyewole, 2006). Adolescence is a period of transition between childhood and adulthood, occupies a crucial position in the human beings. This period is characterized by an exceptionally rapid rate of growth (Shivaramakrishna *et al*., 2011). The peak rates of growth are exceeded only during the fetal life and infancy (Tanner, 1978). In this time, there are massive physiological, cognitive and psychosocial changes, about 25% of adult height, and up to 50% of adult weights are attained during adolescence (Shafer & Irwin, 1991; Rogol *et al*., 2000). It is also a time of sexual development and increase in fat especially in girls and muscle mass in boys (Rogol *et al*., 2000). The demands of this normal physical growth and maturation direct to increased need for nutrients and micronutrients like vitamins A, B_{12}, C, folic acid, Fe and Ca. This places additional nutritional demands on adolescents (Popkin & Gordon-Larsen, 2004). The extra energy demands of the adolescent growth spurt and deficient diet has contributed a lot to the poor weight status of adolescents. In adolescents it has deleterious effects, as it affects their ability to find out and work at maximal competence and also affects their sexual maturation.

***Corresponding author:** Gautam Narayan Sarkar
Department of Community Medicine, Bankura Sammilani Medical College & Hospital, Bankura-722 102, West Bengal

In Bankura district, there is measly information on the weight status of adolescents. The present study was therefore undertaken to assess the prevalence of underweight among rural adolescents in Bankura, West Bengal of India.

MATERIAL AND METHODS

A cross-sectional study was conducted in secondary schools in the Bankura District which is located about 250 km far from the Kolkata, capital city of West Bengal. The study was conducted from August 2012 to December 2012.

Sample

The study was conducted in five rural Government approved secondary co-education schools of Bankura District.

Procedure

Data was collected by random sampling. A total 939 boys and 940 girls studying in 5th to 10th standard in age group of 11-16 years were included. The school records were utilized to ascertain the age of children.

Anthropometric measures

Height and weight of the subjects were recorded using the standard techniques and procedure (Lohman *et al.*, 1988). Height was taken with the help of an anthropometer to the nearest 0.1 cm. The weight was recorded to the nearest 0.5 kg using portable weighing machine and wearing minimum clothing.

Underweight

The children with the Body Mass Index (BMI) less than the 5th percentile BMI standards of the National Centre for Health Statistics (NCHS) were considered as underweight (Elizabeth, 2004).

Analysis

Data collected was entered in Microsoft Office Excel analysis was done for mean and standard deviations. Statistical tests like't' test and chi-square test were applied. All the tests were considered significant at $p < 0.05$ level.

Ethical clearance

Verbal consents of the parents and students were also obtained prior the commencement of study.

RESULTS

Age

In the present study, a total of 1879 children were included from secondary school. The range of age of students was 11 to 16 years. Out of 1879 children, 342 (18.19%) belong to 11+ age group, 278 (14.78%) belong to 12+ age group, 318 (16.91%) belong to 13+ age group, 304 (16.17 %) belong to 14+ age group, 311 (16.55 %) belong to 15 age group and 326 (17.34 %) belong to 16 age group (Table 1).

Sex

In the present study, both boys and girls were included. Out of total 1879 children, 939 (49.94 %) were boys and 940 (50 %) were girls. The present study revealed that both boys and girls were enrolment in same number. The mean age value of boys was 13.88 ± 3.6 years, while the mean age value the girls was 14.12 ± 3.8 years. The difference in age between sex was not statistically significant.

Table 1. Age wise distribution of the participants (N=1879)

Age (years)	Boys N (%)	Girls N (%)	Overall
11	173 (9.2)	169 (8.99)	342 (18.19)
12	133 (7.07)	145 (7.71)	278 (14.78)
13	161 (8.56)	157 (8.35)	318 (16.91)
14	157 (8.35)	147 (7.82)	304 (16.17)
15	156 (8.3)	155 (8.25)	311 (16.55)
16	159 (8.46)	167 (8.88)	326 (17.34)
Total	939 (49.94)	940 (50.0)	1879 (100)

Height and weight

Overall and standard deviation (Mean ±S.D) of height of the girls was 00.0 ± 0.12 boys was. The age wise data revealed that means height of the boys in 11 age group was. The gradual increase in growth was revealed by the weight and height which showed a steady increase with age (Table 2) except at 00 years in males and 00 years in girls. The mean BMI at 00 years for both sexes was 00.00± 0.00 kg/m^2 and by 16 years it had increased to 00.00±0.00 kg/m^2.

Table 2. Mean anthropometric status of the participants

Age (years)	Boys Mean ± SD		Girls Mean ±SD	
	Weight (kg)	Height (cm)	Weight (kg)	Height (cm)
11	23.45±6.67	130.8±8.92	23.04±5.45	128.5±7.88
12	30.20±6.03	137.1±7.76	27.53±6.12	134.1±7.42
13	35.66±5.45	146.7±8.12	31.03±5.66	137.9±6.33
14	38.68±5.87	146.9±9.51	35.50±4.89	141.7±5.85
15	42.18±5.66	164.7±6.55	39.13±6.33	146.4±6.23
16	45.48±6.04	158.6±7.35	42.99±5.56	149.6±6.82

Underweight

Table 3 summarized the prevalence of underweight among the rural children. The overall prevalence of underweight in the studied school children was 53.27%. The prevalence of underweight in boys was 51.1% and in the girls, it was 55.47%. The prevalence of underweight was highest in the age group of 12+ (60.07%).

Table 3. Prevalence of underweight (weight-for-age) among the participants

Age (years)	Underweight		
	Boys N (%)	Girls N (%)	Overall N (%)
11	98 (56.64)	97 (57.39)	195 (57.01)
12	79 (59.39)	88 (60.68)	167 (60.07)
13	74 (45.96)	101 (64.33)	175 (55.03)
14	85 (54.14)	75 (51.02)	160 (52.63)
15	63 (40.38)	68 (43.87)	131(42.12)
16	81 (50.94)	92 (55.08)	173 (53.06)
Total	480 (51.1)	521 (55.42)	1001 (53.27)

DISCUSSION

The present study was undertaken to assess the prevalence of undernutrition among the rural school going adolescent. The survey done in Bankura, found that highly persistence of undernutrition among school going boys and girls. The study revealed that 1001 (53.27%) of the study population were underweight. The prevalence of underweight was highest in the early age group. The prevalence of underweight was more among girls compared to boys (55.42% vs.51.1%). This may be due to improper dietary habits and ignorance of girls in our society. The prevalence of underweight in the present study was lower as compared to other studies. A previous study by Joseph, from rural areas of Karnataka state, prevalence of underweight was reported as 60.4% (Joseph *et al.*, 2002). Another study conducted in the rural area of Vadodara district of Gujarat reported highly prevalence with 70% of children being underweight (Rachna and Iyer, 2011). The study reflects that prevalence of underweight is very high among school children of rural Bankura. There is urgent need to improve nutrition to combat stunting.

Acknowledgements

We are grateful to the school children who participated in the study. We also thank the head master and school authorities of the selected secondary schools for their cooperation during the study.

REFERENCES

Elizabeth KE (2004). Nutrition and child development. 3rd Ed. Hyderabad: Paras Medical Publisher. p. 145-147. http://web.worldbank.org (accessed on June 01, 2013).

Joseph B, Rebello A, Kullu P, Raj VD (2002). Prevalence of malnutrition in rural Karnataka, South India: A comparison of anthropometric indicators. Indian *J Health Popul Nutri*, 3:239-244.

Lohman, TG., Roche, AF. and Martorell, R (). Anthropometric standardization reference manual. Chicago: Human kinetics books, p: 3-80.

Maiti S, Ali KM, De D, Bera TK, Ghosh D, Paul S (2011). A Comparative Study on Nutritional Status of Urban and Rural Early Adolescent School Girls of West Bengal, India. *J Nepal Paediatr Soc*; 31(3):169-174.

Nandy S, Irving M, Gordon D, Subramanian SV, Smith GD (2005). Poverty, child under nutrition and morbidity: new evidence from India. *Bull World Health Organ*; 83:3.

Odunayo SI, Oyewole AO (2006). Risk factors for malnutrition among rural Nigerian children. *Asia Pac J Clin Nutr* 2006; 15:491-495.

Popkin BM, Gordon-Larsen P (2004). The nutrition transition: worldwide obesity dynamics and their determinants**.** *Int J Obes Relat Metab Disord*; 28(Suppl 3):S2-9.

Rachna B, Iyer U (2011). Magnitude of malnutrition and iron deficiency anemia among rural school children: An appraisal. *Asian J Exp Biol Sci*, 2(2):354-361.

Rogol AD, Clark PA, Roemmich JN (2000). Growth and pubertal development in children and adolescents: effects of diet and physical activity. *Am J Clin Nutr*; 72(2): 521-528.

Shafer MB, Irwin CE (1991). The adolescent patient. In: Rudolph AM, editor. Rudolph's pediatrics. 19th. Englewood Cliffs (NJ): Appleton & Lange; p. 39.

Shivaramakrishna HR, Deepa AV, Sarithareddy M (2011). Nutrition Status of Girls in Rural Area of Kolar District-A Cross-Sectional Study. *Al Ameen J Med Sci*; 4(3):243-246.

Tanner JM (1978). Fetus into man: Physical Growth from Conception to Maturity. Wells, Open Book Publishing Limited.

UNICEF (1990). UNICEFPolicy Review: Strategy for improved nutrition of children and women in developing countries. UNICEF, New York: USA; p. 5-36.

WHO (1985). World Health Organization Expert Committee: An estimate for the prevalence of child malnutrition in developing countries. *World Health Stat Q*; 38:331-347.

WHO (1995). World Health Organization. Physical status: the use and interpretation of anthropometry: Technical report series no. 854. Geneva: World Health Organization, p-36.

****