International Journal of Contemporary Pediatrics
Faizur R et al. Int J Contemp Pediatr. 2016 May;3(2):464-467
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20160692

Research Article

Nutritional status of adolescents in urban and rural area of Kanpur

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Received: 27 February 2016
Accepted: 02 March 2016

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ABSTRACT

Background: Adolescents are the future generation of any country and their nutritional needs are critical for the well-being of the society. The present study was undertaken to find out the nutritional status of adolescents in Kanpur.
Methods: This community based, cross-sectional study was conducted in among 954 adolescents in the age group 10-18 years using simple random sampling. A pre-tested and pre-designed schedule was used to collect the information.
Results: The prevalence of under nutrition was 52.09%. Nearly 45.51% and 50.81 adolescents were undernourished in urban and rural areas respectively. A higher proportion of females (56.9%) were found to be underweight as compared to males (44.3%).
Conclusions: It is important to strengthen health education on the consumption of iron rich foods and proper implementation of intervention programs that would increase the hemoglobin levels among the adolescents age group through prophylaxis treatment, dietary modification and helminthes control.

Keywords: Under nutrition, Adolescents

INTRODUCTION

Adolescence is an important stage of growth and development in the lifespan. They are no longer children but not yet adults.[1] This period is very crucial since these are formative years in life of an individual when major physical, psychological and behavioural changes take place.[1]

Adolescence is marked as a period of growth spurt and maturation, extent of physical growth is not determined by genetic, heredity factors alone but also on availability of adequate nutrition, micronutrients in the diet and access to health services. This phase is characterized by exceptionally rapid rate of growth. It is during this time that they gain up to 50% of their adult height and skeletal mass. Growth in stature, muscle and fat mass during the peak of adolescent growth spurt calls for the need of extra nutrients.[2,3]

Inadequate nutrition during adolescence can have serious consequences throughout reproductive years and beyond. Extra nutritional requirements include increased intake of calcium, iron, iodine, minerals and proteins. Unmet nutritional needs lead to several public health problems such as stunted and retarded growth, impaired mental development, anaemia, complications during pregnancy and low birth weight babies.[3]

It is well documented that short stature in adolescents indicating prolonged under nutrition is associated with lower lean body mass, deficiencies in muscular strength and productivity. In adolescent girls, short stature that carries on into adulthood is associated with many concurrent and future adverse health and pregnancy outcomes.[1]

Recent reports of the WHO suggest that in South East Asian Region a large number of adolescents, who constitute 20% of the population in these countries, suffer from malnutrition, which adversely impacts their

health and development, and that anthropometry is a good indicator of nutritional status and health risks in this group.[3] Simple measurements of height and weight serve as reliable measure to evaluate the growth of the child and also to detect gross abnormalities even when no other clinical sign of illness is manifested.

Underweight (low weight-for-age) reveals low body mass relative to chronological age, which is influenced by both, a child's height and weight.[3]

There is little information about nutritional status of adolescents in India. With this background the present study was undertaken with the objective of assessing the nutritional status of adolescents attending schools as well as those residing in Kanpur.

METHODS

The present one year cross-sectional study was conducted in the department of paediatrics, L.L.R. Associated Hospitals, G.S.V.M. Medical College, Kanpur after taking permission from the institutional ethical committee. The adolescents in the age group of 10-18 years studying in various schools, institutions and residing in different urban and rural areas of Kanpur were included. For this, meeting was arranged with principals of schools and colleges and after explaining the purpose of visit, a verbal consent was obtained from them. In home visit consent was obtained from the parent(s) or guardian(s) for the interview and physical examinations. An attempt was also made to include adolescent girls who were examined in the presence of a female attendant. The respondents were interviewed is small batches not exceeding 40 per day. Thus it required multiple visits to complete each school or college in order to get the required information.

Measurements

Age was determined from the register of the school, from which date of birth was noted. In home visits, data was obtained from their parents.

Height: The standing height was measured by asking the adolescent to stand against the wall, heels together without shoes. The head was positioned in the way that line of vision was perpendicular to the body. The height was measured with the help of a flexible measuring tape graduated in centimeters and inches. The height was recorded by putting a ruler on the head in parallel with the ground and reading was taken on the scale to nearest of 0.5 cm.

Weight was measured by portable weighing machine without foot wear. Zero error was checked for and removed if present. Clothes were not removed as adequate privacy was not available. Weight was recorded to nearest of 500 grams.

All the data were collected and scrutinized after the survey. A master chart was prepared to locate the information at a glance. The data were analysed and tables were prepared to highlight the specific information. The degree of malnutrition was graded according to Indian Academy of Paediatrics (IAP) classification.[4]

Modified Prasad's classification was used for classifying the socioeconomic status. SPSS software was used for statistical analysis.

RESULTS

A total of 1126 adolescents were contacted, 954 (84.7%) were studied and 172 (15.3%) could not be interviewed either due to their absence at the time of survey or they refused to give interview. 539 (56.5%) were males and 415 (43.5%) were females. The overall prevalence of under nutrition was 52.09%. A higher proportion of females (56.9%) were found to be underweight as compared to males (44.3%).

Table1: Gender wise distribution of adolescents in relation to socioeconomic status as per modified prasad's classification.

Social class	Male		Female		Total	
	No.	%	No.	%	No.	%
I	44	4.61	43	4.50	87	9.12
II	93	9.75	71	7.44	164	17.19
III	135	14.15	104	10.90	239	25.05
IV	181	18.97	136	14.26	317	33.23
V	86	9.02	61	6.40	147	15.41
Total	539	56.50	415	43.50	954	100.00

Table 2: Distribution of mean weight and height of male adolescents according to socioeconomic status.

Age (years)		Mean weight		Mean height	
		Mean	SD	Mean	SD
10-11	USES	28.9	3.32	137.8	3.68
	LSES	22.0	2.68	130.1	2.82
11-12	USES	32.5	4.12	144.6	3.44
	LSES	26.6	5.31	135.4	2.72
12-13	USES	34.7	5.62	150.8	5.82
	LSES	29.6	4.46	142.3	5.24
13-14	USES	41.5	7.16	154.1	6.18
	LSES	35.7	6.43	147.8	5.20
14-15	USES	46.6	6.56	157.6	4.28
	LSES	39.1	3.88	151.5	6.31
15-16	USES	49.8	4.92	161.8	5.32
	LSES	41.6	5.24	154.4	4.81
16-17	USES	54.5	7.16	163.2	6.76
	LSES	45.2	6.54	156.6	5.87
17-18	USES	57.8	5.81	165.8	3.88
	LSES	48.6	4.32	158.8	4.24

Majority of subjects belonged to Middle socioeconomic class (17.19% in group II, 25.05% in group III and 33.23% in group IV) (Table 1).

Table 2 indicates that male adolescents of upper class attained a mean weight of 28.9 at 10-11 years of age was approximately same as that attained by males of lower class at 12-13 years (29.6). The mean height was more in upper class than the lower class in the corresponding age groups.

Table 3: Distribution of mean weight and height of female adolescents according to socioeconomic status.

Age (years)		Mean weight		Mean height	
		Mean	SD	Mean	SD
10-11	USES	29.1	2.71	136.6	5.54
	LSES	22.3	2.45	129.2	4.36
11-12	USES	32.7	3.62	143.5	6.21
	LSES	25.5	3.28	134.7	3.78
12-13	USES	36.8	4.56	149.4	5.62
	LSES	29.1	4.74	141.3	4.67
13-14	USES	40.2	5.91	152.9	6.46
	LSES	32.9	3.82	145.2	5.21
14-15	USES	42.8	4.84	154.8	5.84
	LSES	35.3	5.16	147.4	3.86
15-16	USES	45.6	6.64	155.2	5.28
	LSES	37.7	3.56	148.8	4.32
16-17	USES	48.8	4.38	156.1	6.82
	LSES	39.6	5.41	149.2	5.61
17-18	USES	52.6	3.28	156.4	6.54
	LSES	40.8	4.32	149.1	4.74

Table 3 shows that the mean weight of female adolescents of upper class at 10-11 year was 29.1 Kg. while the same weight (29.1) was attained by lower class at 12-13 years of age. Like the mean weight, mean height was greater in female adolescents of upper class than lower in corresponding age groups.

Table 4: Nutritional status of urban adolescents (weight for age) (according to Indian academy of paediatrics).

Nutritional status	Male		Female		Total	
	No.	%	No.	%	No.	%
Normal	172	58.50	113	49.34	285	54.49
Grade I	68	23.13	59	25.76	127	24.28
Grade II	37	12.59	37	16.16	74	14.15
Grade III	14	4.76	16	6.99	30	5.74
Grade IV	3	1.20	4	1.75	7	1.34
Total	294	100.00	229	100.00	523	100.00

Table 4 shows that 45.51% urban adolescents were malnourished i.e., 41.50% urban males and 50.66% urban females were malnourished.

Table 5: Nutritional status of rural adolescents (weight for age) (according to IAP).

Nutritional status	Male		Female		Total	
	No.	%	No.	%	No.	%
Normal	128	52.24	84	45.16	212	49.19
Grade I	62	25.31	50	26.88	112	25.99
Grade II	35	14.29	32	17.21	67	15.55
Grade III	15	6.21	15	8.06	30	6.96
Grade IV	5	2.04	5	2.69	10	2.31
Total	245	100.00	229	100.00	431	100.00

The above table reveals that 47.76% rural male adolescents were malnourished while 54.86% rural female adolescents were malnourished. Overall 50.81% were malnourished in rural areas.

DISCUSSION

This study was based on school and home visit among urban & rural as well as in different socioeconomic status. Thus, the result of this survey are representative of school going children and non-school going of rural and urban area belonging to different socioeconomic status.

In the present study 52.09% (45.51% urban and 50.81% rural) adolescents were undernourished. According to their low weight for age. Srinivasan K, et al, Deshmukh, et al and Rao, et al, found prevalence of under nutrition 78.4%, 75.3% and 61.7%, respectively which was higher than present study.[5-7] Similar prevalence has been reported by Dambhare, et al, Mondal, et al and Dey, et al (51.7%, 42.4% and 40% respectively).[1,8,9]

Lower prevalence has been reported by Mukhopadhyay, et al and Das, et al (36.49% and 28.60%, respectively).[10-11]

In the present study prevalence of under nutrition was higher among females than in males. On the contrary under nutrition was higher among males than females in the studies by Mukhopadhyay, et al and Das, et al.[10-11]

Thus a high prevalence (28.60 %-78.4%) of malnutrition has been previously reported from India. This may be attributed to the difference in living conditions and socioeconomic status.

Efforts directed towards improvement of socioeconomic status, living conditions and nutrition education will have a positive impact on the nutritional status of adolescents.

CONCLUSION

It is important to strengthen health education on the consumption of iron rich foods and proper implementation of intervention programs that would increase the hemoglobin levels among the adolescents

age group through prophylaxis treatment, dietary modification and helminthes control.

Funding: No funding sources
Conflict of interest*: None declared*
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Faizur R, Tripathi VN. Nutritional status of adolescents in urban and rural area of Kanpur. Int J Contemp Pediatr 2016;3:464-7.