

Nutritional Deficiency Disorders among Adolescent Girls in Urban Slums of Moradabad

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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 society. In most developing countries, nutrition initiatives have been focusing on children and women, thus neglecting adolescents. Therefore this study was undertaken with the objective of assessing the problem of nutritional deficiency disorders, among adolescent girls in District Moradabad.

Methods: This cross-sectional study was conducted among 524 adolescent girls. Simple random sampling was used to select the individuals from each slum. Clinical signs and symptoms indicative of nutritional deficiency were studied and noted for each subject. A pre-tested and pre-designed schedule was used to collect the information. Chi-square test was applied to analyse data using SPSS software.

Results: In present study overall 88.5% adolescent girls were having any of the nutritional deficiencies. Most common finding was lustreless and easily pluckable hair. Variation in age wise distribution was found statistically significant only for vitamin A deficiency disorders, vitamin C deficiency disorders, koilonychias and easy pluckability of hair. Respondents belong to socioeconomic status III, IV and V and from joint family were maximally affected. Mothers' educational status shows statistically significant correlation with occurrence of deficiency

disorder among adolescent girls.

Conclusion: The prevalence of deficiency disorders among the adolescent age group was remarkably high. It necessitates creating alertness among adolescent age groups towards various deficiency disorders and its complications. Inclusion of various nutritional supplements in various health programmes with consideration of adolescents' requirements.

Key words: Adolescents, Koilonychias, Slum, Vitamin A deficiency disorders, Vitamin C deficiency disorders.

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INTRODUCTION

WHO identifies adolescence as the period of age between 10-19 years. Globally, adolescent girls constitute about 1/5th of total female population¹. While in India, adolescent girls account for a little more than one-fifth of the population (21.4%)².

Adolescence is an important stage of growth and development in the lifespan and is a crucial period of transition from childhood to adulthood in the life of human beings. They are no longer children but are not considered adults yet¹. The phenomenal growth that occurs in adolescence, second only to that in the first year of life, creates increased demands for energy and nutrients. Total nutrient needs are higher during adolescence than any other time in the lifecycle. Nutrition and physical growth are integrally related; optimal nutrition is a requisite for achieving full growth potential³.

Prior to puberty, nutrient needs are similar for boys and girls. It is during puberty that body composition and biologic changes (e.g., menarche) emerge which affect gender-specific nutrient needs. Adolescence in girls has been recognized as a special period which signifies the transition from girlhood to womanhood. Thus foundation of adequate growth and development is laid before birth, during childhood, and is followed during adolescence.

Adolescents are the future generation of any country and their nutritional needs are critical for the well-being of society.

Nutritional deficiency disorders have been identified as the main factor retarding improvements in human development and a major cause for morbidity in India. In Indian adolescent school children; there is a high prevalence of nutritional disorders. Vitamin A deficiency, iodine deficiency disorders, and iron deficiency anaemia affect large numbers of adolescents and retard both physical and cognitive growth and increases susceptibility to infection, further increasing malnutrition³. In most developing countries, nutrition initiatives have been focusing on children and women, thus neglecting adolescents. Addressing the nutrition needs of adolescents could be an important step towards breaking the vicious cycle of intergenerational malnutrition, chronic diseases and poverty. In the prevailing era of health reformation, limited data are available regarding the nutrition profile of adolescents especially in the area of nutritional deficiency disorders. Therefore this study was undertaken with the objective of assessing the problem of nutritional deficiency disorders, among adolescent girls in District Moradabad.

METHODS

This cross sectional study was conducted in the Department of Community Medicine, for a period of one year from August 2014 to July 2015. The study was carried out in the urban slums of Moradabad district with the broad aim of assessing the occurrence of nutritional deficiency disorders & associated factors among adolescent girls. Among all the slums, 6 highly populous slums were selected by random sampling. Simple random sampling was used to select the individuals from each slum. The first household was selected at random by lottery method in each slum. Thereafter, the other subjects were interviewed in sequence till the desired sample size was achieved for the particular slum. Considering the prior prevalence rate of under nutrition in

adolescent girls as 58.5%⁴, with 5% error, the estimated sample size was 373. Information was collected on background characteristics like age, sex, religion, type of family, socio economic status, type of water supply, type of house, way of excreta disposal, sanitation facility etc. B G Prasad classification was used for socioeconomic classification. Clinical signs and symptoms indicative of nutritional deficiency were studied and noted for each subject. Adolescent girls were interviewed in privacy and desired information was collected on a pilot-tested, structured and predesigned schedule through oral questionnaire method. Finally a total of 524 adolescent girls were interviewed. The data was statistically analysed utilizing SPSS (version. 17.0) for Windows.

Table 1: Socio Demographic Distribution of the Adolescent Girls

Variable	Total (n=524)	
	N	%
Age group		
10-13	198	37.8
14-16	218	41.6
17-19	108	20.6
Type of family		
Nuclear	358	68.3
Joint	166	31.7
Education		
Primary or Below	31	5.9
Above Primary to Middle	304	58.0
High school – Intermediate	162	30.9
Above Intermediate	27	5.2
Socioeconomic status		
I	19	3.6
II	66	12.6
III	97	18.5
IV	296	56.5
V	46	8.8

Table 2: Age Wise Distribution of Nutritional Deficiencies among Adolescent Girls

Nutritional disorders	Adolescent girls' age group						Chi Sq (df=2)	p-value
	10-13yrs		14-16 yrs		17-19 yrs			
	N	%	N	%	N	%		
	(N=198)		(N=218)		(N=108)			
Vit A deficiency	4	2.0	14	6.5	10	9.5	8.10	0.017
Vit B deficiency	14	6.5	22	10.7	13	11.9	2.27	0.321
Vit C deficiency	25	11.8	15	6.5	6	4.8	6.04	0.049
Vit D deficiency	32	16.2	49	22.5	18	16.7	3.14	0.208
Dental caries	15	7.6	16	7.3	15	13.9	3.24	0.198
Xerosis of skin	8	4.1	12	5.5	9	8.3	2.46	0.292
Koilonychia	9	4.5	4	1.8	0	0.0	6.61	0.037
Goiter	27	13.6	22	10.1	13	12.1	2.29	0.318
Lustre in hair	78	39.4	86	39.4	54	50.0	3.95	0.139
Thin and sparse hair	94	47.5	82	37.6	47	43.5	4.18	0.124
Easy pluckability of hair	79	39.9	86	39.4	58	53.7	6.92	0.031

RESULTS

In the present study maximum girls were in age group of 14-16 years (41.6%) followed by 10-13 years age group. Nuclear family system (69.1%) was more prevalent in study population. Most of the respondents were educated between primary to middle school (58.0 %). According to modified Prasad's classification maximum number of the adolescent girls (56.5%) belonged to class IV. (Table 1)

In present study overall 88.5% adolescent girls were having any of the nutritional deficiencies. Most common finding was thin and sparse hair (47.5%) in 10-13 years age group whereas lustreless and easily pluckable hair in 14-16 years and 17-19 years age group. Variation in age wise distribution was found in all types' deficiency disorders but it was found statistically significant only

for vitamin A deficiency disorders, vitamin C deficiency disorders, koilonychias and easy pluckability of hair (Table 2)

Deficiency disorders were found maximum in age group 10-13 years (89.9%) followed by in 14-16 years (89.0%). Respondents belong to socioeconomic status III, IV and V and from joint family were maximally affected. Statistically significant correlation was found only in relation to socioeconomic status. (Table 3)

Mothers' educational status shows statistically significant correlation with occurrence of deficiency disorder among adolescent girls. 92.5 % of respondents whose mother's education was less than or equal to primary school were having deficiency disorders. Effect of Fathers educational status was found statistically insignificant. (Table 4)

Table 3: Distribution of Nutritional Deficiency In Relation To Socio-Demographic Characteristics

Socio demographic Characteristics	Total (n=524)			Chi-Square (df)	P-Value
	No. Studied	No. of respondents having Deficiency n=464	%		
Age group (years)					
10-13	198	178	89.9	1.60 (2)	0.449
14-16	218	194	89.0		
17-19	108	92	85.2		
Socio-economic class (Applying modified Prasad's classification)					
I	19	11	57.9	27.3	0.000
II	66	48	72.7		
III	97	89	91.8		
IV	296	274	92.6		
V	46	42	91.3		
Type of family					
Nuclear	358	312	87.2	1.76	0.185
Joint	166	152	91.6		

Table 4: Distribution of Nutritional Deficiency In Relation To Parents' Education

Characteristics	Total (n=524)			Chi-Square (df), P-value
	No. Studied	No. of respondents having Deficiency n=464	%	
Mothers' education				
Less than or equal to primary school	292	270	92.5	9.98 (1)
Above primary school	232	194	83.6	
Fathers' education				
Less than or up to primary school	202	176	87.1	0.655 (1)
Above primary school	322	288	89.4	

DISCUSSION AND CONCLUSION

Out of 524 adolescent girls surveyed, majority were aged between 14-16 years (41.6%) and were from nuclear families (68.3%). Maximum number of the adolescent girls, 304 (58.0%) were educated above primary school level. More than half of respondents belonged to socioeconomic class IV (56.5%) as per Modified Prasad's classification.

As per survey conducted by state planning institute, UP in 2001 about 14.17% adolescents are aged between 10-14 years and 9.84% adolescents are aged between 15-19 years in district Moradabad. As per census 2011 the literacy rate of urban slums

was 84.5% (79.7% among the females and 89.0% among the males)⁵

In the present study vitamin A deficiency was found in 5.4% adolescent girls. A similar observation has been reported in urban Bareilly (6.37%) by Khan et al (2012)⁶. Lower prevalence was reported in urban Ahmadabad (2.9%) by Chauhan et al (2011)⁷. Surveys conducted in various countries of South-eastern Asia have shown vitamin 'A' deficiency ranging from 0.2 % to 15 % in school aged children⁸.

In the present study the overall prevalence of vitamin B deficiency was found to be 9.4% which is higher to that (4.0%) reported by

Choudhary S et al (2003)⁹. Higher prevalence (26.8%) was reported by Blanck HM et al (2002)¹⁰ among adolescent Bhutanese refugees living in south-eastern Nepal. A higher prevalence of angular stomatitis (35.56%) and glossitis (34.15%) was also found among 284 adolescent females in slums in Dibrugarh town by Bhattacharyya et al (2013)¹¹.

In the present study vitamin C deficiency was found in 8.8% of the adolescent girls. Cheung E et al¹² in 2003 in Afghanistan found similar (6.3%) prevalence of scurvy. In contrast to present study Choudhary et al⁹ in 2003 found a higher prevalence of (13.7%) Vitamin C deficiency in Banaras.

In the present study Vitamin D deficiency disorders were found in 18.9% adolescents. This can be attributed to the low dietary intake of vitamin D. American Academy of Paediatrics suggests 400 IU of vitamin D daily among infants, children and adolescents. Another study by Marwaha et al (2006)¹³ in north India also found a high prevalence of nutritional rickets (10.8%) among adolescents aged 10-18 years.

In the present study dental caries were found in 8.8% of the adolescent girls, which is in contrast to the observations made by Moses J et al¹⁴ in 2011 where 1484 (63.83%) out of the 2362 school going children in Chidambaram aged between 5-15 years had dental caries. Wasnik V et al¹⁵ in 2012 in Andhra Pradesh reported a higher prevalence of dental caries (27.1%). In the present study 11.8% adolescents were having goitre. A higher prevalence (16.6%) was observed by Kamath R et al (2009)¹⁶ in Belgaum district of Karnataka.

Most of the adolescent occurrence of Deficiency disorders were found maximally in adolescent belongs to 10-13 year age group, socioeconomic status IV and from joint family. Effect of Mothers' educational status was also found significantly correlate (negative) with occurrence of deficiency disorders. These findings are supported by Spyckerelle Y et al¹⁷. Another study at Varanasi¹⁸ showed that fathers' education status affects more the nutritional status of adolescents than mother educational status. This difference may be due to difference in study frame and regional variation of study setup.

The prevalence of deficiency disorders among the adolescent age group was remarkably high. It necessitates creating alertness among adolescent age groups towards various deficiency disorders and its complications. There is a need of vigorous screening programmes not only at schools but also other adolescents' movement spots such as recreational centres, hobby centres etc. particularly for various nutritional deficiency disorders. Inclusion of various nutritional supplements besides iron and folic acid should also be incorporated in various health programmes with consideration of adolescents' requirements.

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