NUTRITIONAL STATUS OF ADOLESCENT GIRLS IN SLUMS OF DIBRUGARH TOWN- A CROSS SECTIONAL STUDY

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ABSTRACT

BACKGROUND

Adolescence is the important period of life when 35% of adult weight and 11-18% of adult height is acquired. But Adolescent girls (AGs) are particularly at high risk of malnutrition because of gender discrimination in distribution of, and access to, food within the family.

Objective- To assess the prevalence of stunting and thinness among AGs in slums of Dibrugarh district of Assam and the factors influencing.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted in slums of Dibrugarh town of Assam among AGs between 10-19 years. Sample size was calculated to be 135. Two stage sampling was carried out. Firstly, out of 10 registered slums, 5 were selected randomly. Sample was divided proportionately between the 5 slums based on population. In second stage, AGs from each slum were selected by consecutive sampling. Nutritional status was determined using BMI and Height for age using WHO standard.

RESULTS

Prevalence of thinness among AGs was 28.89% and stunting 42.2%. Thinness was found to be significantly associated with educational qualification of father ($p=0.045$) and educational qualification of mother of AG ($p=0.006$).

CONCLUSION

Thinness and stunting among AGs in slums of Dibrugarh town was 28.89% and 42.2% respectively.

KEYWORDS

Adolescent Girls, Slum, Nutritional Status, Stunting, BMI, Thinness.

HOW TO CITE THIS ARTICLE: Boruah M, Ahmed R, Sarmah R. Nutritional status of adolescent girls in slums of Dibrugarh town- A cross sectional study. J. Evolution Med. Dent. Sci. 2017;6(57):4227-4229, DOI: 10.14260/Jemds/2017/917

BACKGROUND

The entire period of transition from childhood to adulthood is considered as adolescence. WHO defines adolescence in terms of age as spanning the ages between 10 and 19 years¹. It is the period when 35% of the adult weight and 11-18% of the adult height is acquired.² Adolescent age group comprises 20.5% of the total population in India of which adolescent girls constitute 9.9%. Adolescence is considered as a nutritionally critical period of life as nutritional requirements increase due to growth spurt and there are changes in lifestyle and food habits.³ Adolescent girls are particularly at high risk of malnutrition because of gender discrimination in distribution of, and access to, food within the family. Gender discrimination plays an important role in intra household food allocation.³ In India, adolescent girls are the most malnourished among women of childbearing age, and over time this has remained unchanged. Childbearing begins by the age of 19 for more than a third of women, contributing to poor maternal nutritional status and birth outcomes.⁴

Financial or Other, Competing Interest: None.

Submission 12-06-2017, Peer Review 06-07-2017,

Acceptance 12-07-2017, Published 17-07-2017.

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DOI: 10.14260/jemds/2017/917

The world's population is increasingly concentrated in urban settlements, presenting both opportunities for and challenges to sustainable development.⁵ Rapid urban growth has led to an increase in the number of urban poor, especially those living in slums. India's urban poor have even outnumbered the rural poor, since 1998. Although urban India has a relatively strong health and nutrition infrastructure - with public sector investments coming from central, state, and local bodies as well as a vast private sector - there is marked inequitable distribution of service availability and utilisation between the rich and poor, between the settled urban population and the marginalised slum dwellers. Vulnerable urban communities continue to be poorly served. This is not only the result of under provision or "service" barriers but is a product of interrelated variables such as poverty, inequitable distribution of primary healthcare services, poor referral systems, vertical programming, and attitudinal and management challenges.⁶

Adolescent girls in slums are a vulnerable group. They are the future mothers and their nutritional status determines their health status in the next stage of their lives. Upper Assam which includes Dibrugarh also has the highest maternal mortality ratio in India- 404 for 1 lakh live births.⁷

So, this study was conducted to assess the nutritional status of adolescent girls in slums of Dibrugarh district of Assam and determine the factors influencing their nutritional status.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted in slums of Dibrugarh town of Assam among adolescent girls in the age group of 10-19 years for a period of 6 months from June to November 2016. The sample size was calculated to be 135 by using the formula, $n = Z^2PQ/d^2$ considering prevalence of thinness (P) as 31.33% among adolescent girls in urban slums of Dibrugarh⁸ and taking 8% absolute error (d), $Q=P-1$ and $Z=1.96$ for 95% confidence interval.

There are a total of 10 registered slums in Dibrugarh town and 5 slums were chosen randomly for the study using random number table. From each slum 27 adolescent girls were included. The first household in each slum was selected randomly as per method described for Expanded Programme of Immunization (EPI) by WHO⁹ and then subsequent households were visited consecutively. Households where adolescent girls were present were included in the study.

In each household, the adolescent girl was carefully briefed regarding the purpose of the study. Written informed consent was obtained from all 18-19 years old adolescent girls. For 10-17 years adolescent girls, assent was obtained from the adolescent girl and written informed consent from their legal guardian prior to the interview.

Nutritional status of adolescent girls was determined based on anthropometric measurements. Height was recorded using portable stadiometer up to nearest 0.1 cm and weight was recorded by electronic weight scale up to 0.10 kg wearing no shoes, with light clothing. BMI for age and Height for age were then determined using WHO standards. Thinness was defined as BMI for age below -2 SD (Standard deviation) and stunting as height for age below -2 SD. Age of adolescent girls was determined using documentary evidence wherever available.

The study population was described by using percentage, mean and SD. Data was analysed using Chi-square test and Fisher-exact test.

RESULTS

Out of 135 adolescent girls, majority (74.7%) were in the age group of 10-14 years. The mean age of the study participants was observed to be 14.05 ± 2.28 years. Majority (93.33%) of the adolescent girls were literate but 21.48% were out of school. Most of the adolescent girls belonged to nuclear families (67.6%). [Table 1].

Overall 39 (28.9%) adolescent girls in slums of Dibrugarh were thin (including both Thinness and Severe Thinness). However, 96 (71.7%) had normal BMI and no obese or overweight adolescent girls were observed. Overall 57 (42.2%) adolescent girls in slums of Dibrugarh were stunted (including both stunted and severe stunted). [Table 2].

The prevalence of overall thinness was higher (71.8%) in the age group of 10-14 years as compared to the age group of 15-19 years (28.2%). Also among school going adolescent girls, prevalence of thinness 79.5% was higher compared to out of school going adolescent girls 20.5%.

Educational qualification of father ($p=0.045$) and educational qualification of mother of adolescent girl ($p=0.006$) was found to be significantly associated with thinness in adolescent girls. But other sociodemographic factors were not found to be significantly associated with thinness in adolescent girls.

Sociodemographic Characteristics		Adolescent Girls (n=135)	
		No.	%
Age (years)	10-14	100	74.07
	15-19	35	25.93
Educational qualification (Father)	Illiterate	48	35.56
	Below Primary School	18	13.33
	Primary to Middle School	33	24.44
	High School & above	36	26.67
Educational qualification (Mother)	Illiterate	70	51.85
	Below Primary School	18	13.33
	Primary to Middle School	29	21.48
	High School & above	18	13.33
Educational qualification (Adolescent girls)	Illiterate	9	6.67
	Below Primary School	9	6.67
	Primary to Middle School	77	57.04
	High School & above	40	29.63
Type of Family	Nuclear	90	66.67
	Joint	45	33.33
Socioeconomic Status (B. G. Prasad Classification)	Class I	1	0.74
	Class II	13	9.63
	Class III	36	26.67
	Class IV	67	49.63
	Class V	18	13.33
School Enrolment status	School going	106	78.52
	Out of school	29	21.48

Table 1. Distribution of the Adolescent Girls According to Sociodemographic Characteristics

Nutritional status of Adolescent Girls			Number (n=135)	%
BMI for age	Obesity	>+2 SD	0	0
	Overweight	>+1 SD to +2 SD	0	0
	Normal	-2 SD to +1 SD	96	71.7
	Thinness	<-2 SD to -3 SD	25	18.5
	Severe thinness	<-3 SD	14	10.4
Height for age	Normal	>-2 SD	78	57.8
	Stunted	(<-2 SD to -3 SD)	48	35.6
	Severely stunted	(<-3 SD)	9	6.6

Table 2. Nutritional Status of Adolescent Girls

Sociodemographic Characteristic of Adolescent Girls		Thinness (n=39)		p-value *
		No.	%	
Age (Years)	10-14	28	71.8	0.700
	15-19	11	28.2	
Educational qualification (Father)	Illiterate	10	25.6	0.045
	Below Primary School	2	5.1	
	Primary to Middle School	12	30.8	
	High School & above	15	38.5	
Educational qualification (Mother)	Illiterate	14	35.9	0.006
	Below Primary School	3	7.7	
	Primary to Middle School	12	30.8	
	High School & above	10	25.6	
Educational qualification (Adolescent girls)	Illiterate	0	0.0	0.136
	Below Primary School	4	10.3	
	Primary to Middle School	21	53.8	
	High School & above	14	35.9	
Type of Family	Nuclear	27	69.2	0.689
	Joint	12	30.8	
Socioeconomic Class	Class I	1	2.6	0.428
	Class II	2	5.1	

(B. G. Prasad Classification)	Class III	10	25.6	0.862
	Class IV	20	51.3	
	Class V	6	15.4	
School Enrolment Status	School going	31	79.5	0.862
	Out of School	8	20.5	
Table 3. Thinness in Adolescent Girls and Sociodemographic Characteristics				

[Percentages are calculated column wise] *Chi-Square test

DISCUSSION

In the present study, the prevalence of thinness among adolescent girls in slums of Dibrugarh was 28.89%. Bhattacharyya M et al reported 30% prevalence of underweight among adolescent school girls in urban slum of Kolkata.¹⁰ Baliga et al reported 39.43% adolescent girls between the age 15 and 19 years were thin from District Belgaum, Karnataka.¹¹ Difference in prevalence reported by Baliga et al may be due to non-inclusion of 10-14 years age group of adolescent girls.

In the present study, no adolescent girl was overweight or obese. Kowsalya T et al observed 6.86% adolescent girls in Salem District, India were overweight or obese.¹² Patanwar P et al reported 3.6% adolescent girls in Raipur city, Chhattisgarh as overweight.¹³ Lower sample size in the present study may have been the cause of this observation.

42.2% adolescent girls were stunted in the present study. Rajaretnam T et al observed 26.5% stunting among adolescent girls in urban areas of northern Karnataka.¹⁴ Stunting among adolescent girls in rural areas was reported in the range of 40.84% to 30.39% in different parts of India.^{11,15} Higher stunting among adolescent girls observed in slums in Dibrugarh signifies that chronic malnutrition is a major problem here.

In the present study, thinness was found to be significantly associated with educational qualification of parents of adolescent girl but not socioeconomic status. Chaudhary S et al observed thinness in adolescent girls decreased with increase in literacy status of the family. In the present study, thinness was more in lower socioeconomic class (III-V) than higher (I-II) but the association was not significant. Chaudhary S et al also made similar observation that undernutrition was significantly less in the subjects belonging to higher socioeconomic class.¹⁶

CONCLUSION

Thinness (28.89%) and stunting (42.2%) among adolescent girls in slums of Dibrugarh can lead to impaired growth. Education status of parents is significantly associated with thinness in adolescent girls.

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