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## ASSESSMENT OF NUTRITIONAL STATUS OF ADOLESCENT GIRLS IN RURAL AREA OF DISTRICT VARANASI

SWETA SINGH\*, DR. SANGEETA KANSAL\*\* AND DR. ALOK KUMAR\*\*\*

### *Declaration*

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### *Abstract*

*Adolescence is an intense anabolic period when requirements for all nutrients increases. . Unsound food habits and lack of nutritional awareness are considered to be the main factors in determining nutritional status in rural areas. Adolescents are more vulnerable to malnutrition. (WHO, 1994).The aim of this study is to assess the nutritional status of adolescent girls using weight and height measurement. This is a cross-sectional study design using multistage random sampling method. 650 adolescent girls aged 15-19 years were selected as the study subjects. Pertinent information was obtained on a predesigned and pretested Interview schedule. The data thus obtained was analysed using SPSSv16.0. Analysis shows that 26.6% of adolescent girls were undernourished (BMI < 18.5) & 16.3% adolescent girls were at high risk of developing obesity in near future due to increased (BMI > 25.9). Caste, religion and marital status were significantly ( $p < 0.05$ ) associated with nutritional status of adolescents. Therefore the study recommends the strong need of nutritional education for adolescents in the rural area. Focus will be given to adolescents who are married & belong to weaker section of society.*

**Key words:** BMI, Adolescents, Malnutrition, Obesity

### *Introduction*

Adolescence is the transitional period between childhood and adulthood. During this period individual move towards physical and psychological maturity, and economic independence and acquire their adult identity. Demographically, India is a young country today as more than 70% of the population is under

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the age of 35. According to census 2001, there are 225 million adolescents in the age group of 10 to 19 years. Adolescence is an intense anabolic period when requirements for all nutrients increases. This period is very crucial since these are formative years in the life of an individual when major physical, psychological and behavioural changes take place<sup>1</sup>. Adolescent girls, constituting nearly one tenth of Indian population, form a crucial segment of the society. The girls constitute a more vulnerable group especially in the developing countries where they are traditionally married at an early age and are exposed to greater risk of reproductive morbidity and mortality. In general adolescent girls are the worst sufferers of the ravages of various forms of malnutrition because of their increased nutritional needs and low social power.<sup>2</sup> Nutritional deficiencies has far reaching consequences, especially in adolescent girls. If their nutritional needs are not met, they are likely to give birth to undernourished children, thus transmitting under nutrition to future generation. Unfortunately assessment of nutritional status of adolescent girls has been the latest explored area of research particularly in rural India.<sup>3</sup> Malnutrition prevails in rural area due to low economic status, less awareness about healthy diet of adolescent girls. Hence it is essential to assess the nutritional status of adolescent girls, especially in rural area.

### *Objectives*

1. To assess the nutritional status of adolescent girls
2. To ascertain the association between different socio-demographic characters (caste, religion, and marital status) and nutritional status.

### *Material and Methods*

A community based cross-sectional study was conducted during January 2011 to July 2011. Taking into consideration the time restraints and convenience, eight Villages from eighty-four village panchayats in Chiraigaon community development block were selected through multistage random sampling. Six hundred and fifty adolescent girls of the age group 15-19 years were interviewed. Height & Weight were measured using standard techniques. Nutritional assessment was done on the basis of BMI. Pertinent information on socio demographic variables was obtained on a pre-design and pre-tested interview schedule.

Following standard techniques were used for measurements :

*Height* : Height in centimetres was marked on a wall with the help of a measuring tape. All girls were measured against the wall without foot wear and with heels together and their heads positioned so that the line of vision was perpendicular to the body. A glass scale was brought down to the topmost point on the head. The height was recorded to the nearest 1 cm. (Maiti Soumyajit et al)<sup>6</sup>

*Weight*: The weight was measured using a weighing machine (Libra) with an accuracy of + 100gm. The subjects were asked to remove their footwear before measuring their weight. The scales were recalibrated after each measurement.

Accuracy of the weighing scale was verified from time to time against known weights. (Gupta M.K. et al)<sup>4</sup>

*BMI*: BMI of the study subject was calculated by using the formula weight (kg)/ height<sup>2</sup> (m<sup>2</sup>). For grading proposed criteria of BMI for Asians (Choo V 2002) and CDC (2010) was adopted.

*Statistical Analysis* : Data thus generated were analysed using SPSS software.

### *Results*

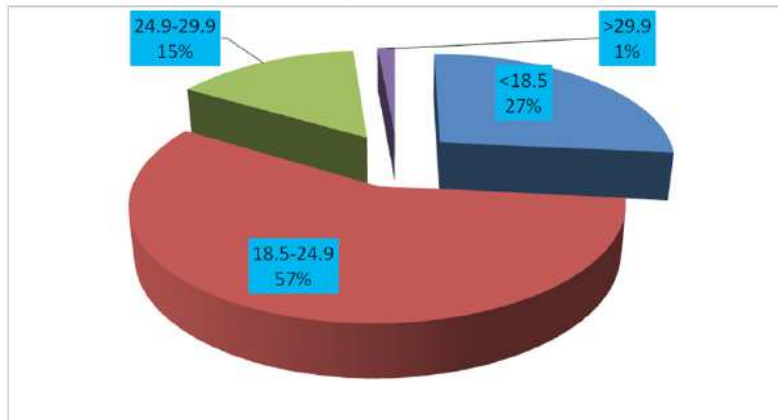
Out of the 650 adolescent girls participated in the study majority (91.7%) were Hindus. Caste wise distribution shows that more than fifty percent were belong to OBC category, 28% General, and only

13.4% were SC. In the study area majority of the respondent were (71.6%) school going & approx. one third were school dropouts. Almost same findings were observed in relation to marital status of respondents, three fourth of the total were unmarried & only 9.5% were married and living with their husband. There is one more important category of adolescent girls who are married (13.2%) but gauna was not done. Out of the total socio demographic variables considered in the study significant association was seen with caste, religion, and marital status only.

The findings of this study (shown in pie-diagram) shows that out of 650 adolescent girls, more than 50% were having BMI between 18.5-24.9, and 27% were below 18.5 only 16% were above 24.9 & at higher risk of developing obesity.

Out of total 650 adolescent girls 13.4%, 58.6% and 28% belonged to SC, OBC and Other caste

Distribution of adolescent girls according to BMI status



category, respectively. Nutritional status of adolescent girls was found significantly ( $p < 0.05$ ) associated with their caste. Under-nutrition was significantly high among girls who belonged to Schedule Caste category. Under different caste categories 39.1%, 26.6% and 22% study subjects were underweight in SC, OBC and Other caste groups, respectively. This variation in under-nutrition among girls from different caste groups may be due to variation in their socioeconomic characteristics and

thereby difference in availability of quality food. (Table: 1)

TABLE 1 Distribution of BMI according to Caste

CASTE	Underweight (BMI < 18.5)		Normal weight (BMI 18.5 – 24.9)		Total	
	No.	%	No.	%	No.	%
Schedule Caste	34	39.1	53	60.9	87	100.0
Other Backward Caste	99	26.6	282	74.0	381	100.0
Other Caste (General)	40	22.0	142	78.0	182	100.0
Total	173	26.6	477	73.4	650	100.0

Chi-square( $x^2$ )=9.003, df=2,  $p=0.011$

Majority (91.7%) of adolescent girls were Hindu by religion. Religion was found to have a significant ( $p < 0.05$ ) influence on nutritional status of adolescent girls. Hindu girls were more vulnerable to under nutrition (27.7%) in comparison to Muslim girls (14.8%). This variation in the trend indirectly represents religion wise variability in food accessibility and dietary intake.(Table:2)

TABLE 2 Distribution of BMI according to Religion

Religion	Underweight (BMI<18.5)		Normal weight (BMI=18.5-24.5)		Total	
	No.	%	No.	%	No.	%
Hindu	165	27.7	431	72.3	596	100.0
Muslim	8	14.8	46	85.2	54	100.0
Total	173	26.6	477	73.4	650	100.0

Chi-square( $x^2$ )=4.199, df=1,  $p=0.040$

As much as three forth (75.5%) respondents were unmarried while 24.5% girls were married or engaged to be married. Out of these married subjects 41.9% were biologically married at the time of interview. Table 3 indicates that nutritional status of adolescent girls was significantly ( $p < 0.05$ ) associated with their marital status. The girls who were engaged to be married were found more at the risk of under-nutrition (63.6%) than the girls who were unmarried, biologically married and married but still waiting for gauna. That represents the girl's psychology to look slim and beautiful at the time of marriage, so indulge in dieting and other aggressive physical activities to reduce their weight drastically within a short span of time. Biological marriage and complete settlement of family was showing a psychological satiety effect on nutritional status.(Table:3)

T A B L E 3 *Distribution of BMI on the basis of Marital status of adolescent girls*

Marital status	Underweight (BMI < 18.5)		Normal weight (BMI = 18.5-24.9)		Total	
	No.	%	No.	%	No.	%
Unmarried	129	26.3	362	73.7	491	100.0
Married (living with husband)	10	16.1	52	83.9	62	100.0
Married (Awaiting gauna)	27	31.4	59	68.6	86	100.0
Engaged to be married	7	63.6	4	36.4	11	100.0
Total	173	26.6	477	73.4	650	100.0
Chi-square( $\chi^2$ )=1.22, df=3, p=0.007						

### *Discussion*

Adolescents have specific health and development needs, and many face challenges that hinder their well being. In the present study 26.6% of adolescent girls were underweight and 16.3% were found at high risk of overweight and obesity. Most of the girls in the study area were having normal BMI (57%). This variation is due to adequate knowledge and awareness regarding nutritional health, because majority of the girls were school going. Choudhary S et al<sup>2</sup> reported that 68.52% of adolescents had BMI less than 18.5 in rural area of Varanasi. This study finding is in contrast with our study findings. The extent of undernutrition was slightly lower (27%) in our study in comparison to 36.49% of undernutrition reported by Mukhopadhyaya A et al (2005)<sup>4</sup>. The findings in the study of Shivaramakrishna et.al (2011)<sup>3</sup> reported that there is higher prevalence of undernutrition in adolescent girls, this is in contrast with our findings. The study findings of Deshmukh et al<sup>5</sup> is somewhat coherent to our study because it reported 44% of adolescent girls have normal weight in rural areas. Undernutrition was prevalent among the rural adolescent girls of Ethiopia (Afework et al)<sup>6</sup>, this is again in contrast with our findings. Prevalence of malnutrition in the present study (43%) appeared to be distinctively lower than the study done by Maiti et al<sup>7</sup> (71.7%). The correlation between nutritional status and demographic characters are similar to the study done by Choudhary et al and T Kumar Ashok<sup>8,9</sup>. The rate of undernutrition among adolescent girls of the present study (27%) demonstrated a significantly higher rate of undernutrition compared to Bangladeshi girls (16%) studied by Ahmed et al. (1998)<sup>10</sup>, but lower than Kenyan refgee girls (55%) and rural Indian girls (40%) reported by IRC (1997)<sup>11</sup> and Venkaiah et al (2002)<sup>12</sup> respectively.

### *Conclusion & Recommendations*

This study found that majority (57%) of adolescent girls have normal BMI, 27% have lower BMI, if their nutritional needs are not met, they are likely to give birth to undernourished children, thus transmitting undernutrition to future generations.

Therefore it is essential to provide nutritional education to adolescent girl's especially in rural areas and to the weaker sections of the society. Adolescent girls (16%) have higher BMI, these overweight and obese girls predispose to heart diseases, hypertension, and other chronic diseases near future.

Therefore, it is essential to implement adolescent friendly health services at primary health care level with emphasis on nutritional counselling component both for married & unmarried. This will decrease the poorly nourished adolescent mothers, who are more likely to give to low birth-weight babies, perpetuating a cycle of health problems which pass from one generation to another.

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