

**Dietary habits and frequency of consumption of food items among rural adolescent girls in Mandya**

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**ABSTRACT**

**Background:** Nutritional status of adolescents in low and middle income countries like India is poorer compared to high income countries. There increase in prevalence of malnutrition around the globe and poor diet is also adding up to the increasing burden of noncommunicable diseases. **Objectives:** To study dietary habits of adolescent girls; To study frequency of consumption of different food items. **Methodology:** This is a cross sectional study conducted in rural field practice area of department of Community Medicine, Mandya Institute of Medical sciences, Mandya. Data was collected using pretested semi structured questionnaire and analyzed for frequencies and percentages. **Results:** Total adolescents included in this study were 302. More than half of them consuming mixed diet and only around 50% consumed regular meals. The food consumption among adolescent girls was deficit in both calories and protein. Deficit was around 1/3<sup>rd</sup> and it was more in the age group of 16-19 years for both calories and protein. Ragi was consumed on daily basis and sunflower oil was most commonly used. Around 1/4<sup>th</sup> of them consumed junk foods on daily basis. **Conclusion:** Dietary habits of adolescents was poor and irregular. It lacked regular consumption of fruits and vegetables.

**Key Words:** dietary habits, adolescent girls, nutrition

**INTRODUCTION**

There are around 1.2 billion adolescents in the world according to World health Organization statistics and major chunk is in developing countries. As per 2011 census there are about 25.3 million adolescents in India which accounts for 20.9% of the population.<sup>1,2</sup> Adolescence is a period during which major changes in stature, bone mass and 50% of adult weight gain occurs (physical, biological, psychological growth and development). Growth and prosperity of country depends on nutritional status and development of adolescents. There is a relationship between nutritional status and dietary intake, dietary habits, practices etc. With some consuming only specific food items like rice is staple diet in some parts of country they suffer from nutritional deficiencies.<sup>3</sup>

Diet and health are interrelated. Nutritional status of adolescents in low and middle income countries like India is poorer compared to high income countries. There increase in prevalence of malnutrition around the globe and poor diet is also adding up to the increasing burden of non-communicable diseases. Nutritional status of adolescents effect the future generations leading to increasing mortality and morbidity among new-borns, u-5 children and maternal mortality and morbidity.<sup>4</sup>

Snacking energy dense foods, skipping meals/irregular meals, increased consumption of fast foods and less

frequent consumption of fruits and vegetables are commonly seen habits among adolescents.<sup>5,6</sup>

Appropriate and adequate dietary intake and healthy dietary habits during adolescence not only important for their immediate growth and performance but will have impact on their long term health. There is wide variation in dietary habits among different communities and dietary habits of adolescents are affected by food habits of their family and community. Other factors like Socio-economic status, religion, customs, traditions etc also effects the dietary habits of the adolescents.<sup>7</sup> Assessment of dietary habits and food frequency pattern of adolescent girls will help in determining pattern and adequacy of food consumption. This study was conducted with the objectives;To study dietary habits of adolescent girls; To study frequency of consumption of different food items

**METHODOLOGY**

The present study is a cross sectional study, was conducted in the rural field practice area of the Department of Community Medicine, MIMS, Mandya. It was a cross sectional study conducted between August 2014 – July 2015. Adolescent girls in the age group of 10-19 years under the purview of Rural health training center were included in the study by simple random sampling of the villages under the purview of

RHTC. RHTC has 18 villages under its purview and total population is 14,303. The sample size was calculated considering prevalence of malnutrition as  $p = 57\%$  based on the previous literature,  $q$  is  $(100 - 57)$ .<sup>8</sup> The permissible error of the estimate (1) was set at 10%. The villages were listed and were selected randomly for inclusion in our study. House to house visit was done in the selected villages till the required sample size of 302 was met. Where more than one adolescent girl were found in the house one of them were selected randomly and included in our study. The adolescent girls and their parent/guardian were explained about the study and those who gave informed consent for the study; data regarding socio-demographic characteristics was obtained by interview method using a predesigned and pretested semi structured questionnaire.

Questionnaire consisted of two parts. Part 1: socio demographic characteristics and part 2: dietary habits and frequency of consumption. For determining the intake of calories and fat, 24hours recall method was used and excess or deficit consumption was determined. To assess the dietary habits of the adolescent girls, in addition to frequency of consumption of different food items, nature of diet, timing of the meal and frequency of meals was taken into consideration. The participants who consumed both vegetarian and non-vegetarian food items including egg were considered as consuming mixed diet.

The calorie and protein requirement for the adolescent girls were taken from National Institute of Nutrition, 2011 guidelines. The quantity consumption for calculating calorie and protein intake was considered in approximation as per the data provided by the adolescent girls and exact measurement was not done. The energy and protein intake was calculated according to the nutritive value of common Indian foods by NIN, Hyderabad.<sup>9</sup> Data was entered in Microsoft excel sheet and analysed for proportions.

**RESULTS**

**Table 1: Socio demographic characteristics of study subjects**

Socio demographic variables	Number	Percentage
Age group in years	10-12	53 17.6
	13-15	137 45.3
	16-19	112 37.1
Education	Primary school	61 20.2
	High school	152 50.3
	College	89 29.5
Socio economic status	Class II	23 7.6
	Class III	126 41.7
	Class IV	101 33.7
	Class V	51 16.7

Table 1: Among 302 adolescent girl’s maximum number of adolescent girls were in the group of 13 to 15 years (45.3%), followed by 16-19 years (37.1%) and 10-

12years (17.6%) respectively. Most of the adolescent girls very Hindu by religion (97.4%). Socio economic status (SES) was assessed by modified B G Prasad’s classification. Three fourth of the adolescent girls belonged to SES class III and IV i.e. 126 (41.7%) and 101 (33.7%) respectively. Less than 10% belonged to SES class II (7.6%) and SES class I (0.3%).

**Table 2: Distribution of adolescents according to nature of diet and frequency of food consumption**

Variables	Number	%
Nature of diet	Vegetarian	46 15.2
	Mixed diet	256 84.8
Timing of meal	Fixed	152 50.4
	Irregular	150 49.6
	Twice a day	26 8.52
Frequency of food consumption	Thrice a day	110 36.7
	2-3 times a day	104 34.5
	Four times a day	5 1.5
	> Four times a day	57 18.8

Out of 302 adolescent girls, all of them were either doing or had completed primary schooling, 4 (1.3%) of the adolescent girls had discontinued high school and had rejoined after a year or more. 7 (1.9%) who were in college had similarly discontinued their studies in between. 15 (5.1%) adolescent girls were presently not pursuing their studies.

Table 2: Among 302 adolescent girls, maximum were consuming mixed diet (84.8%) and only 15.2% of them were vegetarians by diet. Half of the adolescent girls consumed meals at a fixed time and half the adolescent girls consumed meals on irregular timing. 1/3<sup>rd</sup> of the adolescent girls consumed meals three times a day and other 1/3<sup>rd</sup> consumed 2-3 times a day. Very few (1.5%) of them consumed meals four times a day and 1/5<sup>th</sup> of the adolescent girls (18.8%) consumed meals more than four times a day.

Table 3: The calorie and protein requirement for the adolescent girls were taken from National Institute of Nutrition, 2011 guidelines. The energy and protein intake was calculated according to the nutritive value of common Indian foods by NIN, Hyderabad. The calorie & protein intake were deficit in all the age groups. For the age group between 10-12 years the energy and protein intake were deficit by 29.2% and 21.7% compared to RDA. The calorie and protein intake of the adolescent girls for the age group between 13-15 years were deficit by 38.9% and 28.6%. For the age group between 16-17 years the calorie and protein intake was deficit by 41.8% and 33.6% and 32.5% & 32.7% in 17-19 years age group respectively.

Table 4: The study subjects consumed items like rice almost every day and more than 50% of them consumed ragi on daily basis. When frequency of consumption of pulses was considered the consumption of bengal gram and black gram was more frequent than red gram dhal and green gram dhal.

**Table 3: Energy and protein consumption by adolescent girls**

Age (Years)	Energy (kcal/day)			Protein (g/day)		
	RDA	Mean $\pm$ 2SD	Deficit (%)	RDA	Mean $\pm$ 2SD	Deficit (%)
10-12	2010	1335.5 $\pm$ 88.51	29.2	40.4	25.5 $\pm$ 6.13	21.7
13-15	2330	1303.1 $\pm$ 120.19	38.9	51.9	30.5 $\pm$ 6.54	28.6
16-17	2440	1306.8 $\pm$ 113.80	41.8	55.5	30.2 $\pm$ 6.67	33.6
17-19	2230	1322.6 $\pm$ 183.4	32.5	55	30.8 $\pm$ 6.23	32.7

**Table 4: Consumption frequency of various food items by adolescent girls**

Food items	Frequency of use				
	Daily	Weekly	Monthly	Occasionally	Never
<b>Cereals</b>					
Rice	302 (100)	0	0	0	0
Wheat	21 (7)	220 (72.8)	37 (12.3)	18 (6.0)	6 (2.0)
Ragi	151 (50.0)	80 (26.5)	16 (5.3)	22 (7.6)	29 (9.6)
Maize	0	9 (2.9)	32 (10.6)	135 (44.7)	120 (39.7)
<b>Pulses</b>					
Red gram dhal	76 (25.2)	123 (40.8)	60 (19.9)	27 (8.9)	16 (5.3)
Bengal gram dhal	51 (16.9)	160 (53)	59 (19.5)	27 (8.9)	5 (1.7)
Black gram dhal	24 (7.9)	164 (54.3)	77 (25.5)	27 (8.9)	10 (3.3)
Green gram dhal	41 (13.6)	118 (39.1)	73 (24.2)	52 (17.2)	18 (6.0)
<b>Green leafy vegetables</b>	143 (47.4)	119 (39.4)	18 (6.0)	15 (5.0)	7 (2.3)
<b>Other vegetables</b>	54 (17.9)	135 (44.7)	68 (22.5)	42 (13.9)	3 (1.0)
<b>Roots and tubers</b>	61 (20.2)	129 (42.7)	67 (22.2)	40 (13.2)	5 (1.7)
<b>Fruits</b>	123 (40.7)	124 (41.1)	34 (11.3)	16 (5.3)	5 (1.7)
<b>Milk and its products</b>	176 (58.3)	74 (24.5)	21 (7.0)	12 (4.0)	19 (6.3)
<b>Eggs</b>	24 (7.9)	141 (46.7)	62 (20.5)	32 (10.6)	43 (14.2)
<b>Fleshy foods</b>					
Mutton	1 (0.2)	68 (22.5)	135 (44.7)	31 (10.3)	67 (22.2)
Chicken	1 (0.3)	86 (28.5)	115 (38.5)	35 (11.6)	65 (21.5)
Fish	0	18 (6.0)	67 (22.2)	90 (29.8)	127 (42.1)
Beef	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)	298 (98.7)
Pork	5 (1.7)	1 (0.3)	1 (0.3)	1 (0.3)	294 (97.4)
<b>Jaggery</b>	90 (29.8)	152 (50.3)	31 (10.3)	26 (8.6)	3 (1.0)
<b>Oils</b>					
Ground nut	34 (11.3)	39 (12.9)	16 (5.3)	93 (30.8)	120 (39.7)
Sunflower	254 (84.1)	19 (6.3)	12 (4.0)	14 (4.6)	3 (1.0)
<b>Pickle</b>	129 (42.7)	102 (33.8)	35 (11.6)	26 (8.6)	10 (3.3)
<b>Bakery items</b>	77 (25.5)	147 (48.7)	47 (15.6)	26 (8.9)	4 (1.3)
<b>Road side chats</b>	46 (15.2)	105 (34.8)	81 (26.8)	55 (18.2)	15 (5.0)

The consumption frequency of vegetables was less than 50% on daily basis & 39.4% consumed GLV once a week. 2.3% of adolescent girls never consumed GLV. There was no much difference in the consumption of other vegetables and roots & tubers. 40.7% of adolescent girls consumed fruits every day and 1.7% never consumed fruits. 8.0% of adolescent girls consumed egg on daily basis and less than 50%

consumed egg once a week. 14.2% of adolescent girls never at egg.

The frequency of consumption of chicken and mutton on daily and also weekly basis was almost same. Very few (2.5%) of adolescent girls consumed pork and beef. Around 50% consumed jaggery once a week and about 30% consumed it every day. Most of the adolescent girls (84%) consumed sunflower oil and only 11.3% consumed groundnut oil.

## DISCUSSION

In our study maximum number (84.8%) of the study subjects were consuming mixed diet. About half of them consumed meals on fixed timings and half of them consumed meals on irregular basis. Around 1/3<sup>rd</sup> of adolescent girls consumed meals 2-3 times a day (34.5%) and thrice a day (36.7%). Only around 18.8% of them consumed meals more than four times a day. The food consumption among adolescent girls was deficit in both calories and protein. Deficit was around 1/3<sup>rd</sup> and it was more in the age group of 16-19 years for both calories and protein.

A study by S Chowdary et. al, among rural adolescent girls, majority of study subjects followed mixed diet and around 36.6 % ate 3 meals a day. Only around half of them consumed meals on regular basis. The findings of this study are similar to finding of our study.

Adolescent girls in our study consumed rice on daily basis and half of them consumed ragi every day. Most commonly used pulse was red gram dhal and bengal gram. Only about 13.1% of them consumed green leafy vegetables every day and 39.1% consumed leafy veg at least once a week. About half (46.7%) of the adolescent girls consumed egg once a week. About 1/4<sup>th</sup> of them consumed chicken and mutton at least once a week and about 40% of them consumed once a month. About 60% of them consumed milk and milk products on daily basis. Sunflower oil was the most commonly used oil and only about 11.3% of them consumed ground nut oil. About 1/4<sup>th</sup> of the adolescent girls consumed bakery items every day and around 50% of them consumed once a week. About 1/3<sup>rd</sup> of them consumed pickle and road side chats once a week. .

A study was conducted by Puri S et. al among urban and rural high school adolescents of Chandigarh. The study found that about 56.7% rural adolescents were vegetarians; only 12.8% of them consumed vegetables on daily basis and about 15.9% skipped breakfast. About 58.8% of the study subjects preferred fast food items over the regular meals. Among the junk food items, samosa (42.4%), tikki/chat (39.7%), noodles (25.4%), burger (24.5%) and pizza (23.3%) were preferred by most of the adolescents.<sup>10</sup>

Vipna Kumari Bhandari conducted a study on nutritional status, dietary practices and nutrition related beliefs of high school girls in urban area of Bangalore city. 57.3% girls ate green leafy vegetables once a week and 18% of girls did not consume non vegetarian food. 85.3% did not take breakfast and they skipped it and 90.7% girls eat while watching TV.<sup>11</sup>

Srivastava S P conducted a study on dietary practices and beliefs among adolescent girls in Bihar. A vast majority of respondents were consuming three major meals in the day. This practice was same in both high and middle SES (92% to 100%) whereas in the low SES substantial proportions (23.4% to 32%) were eating only two or lesser meals per day. The practice of snacks interspersed between the major meals was also almost universal in high and middle SES and was less frequent

in the low SES. This study also compared the dietary practices of adolescents in rural area and found that about half (54.5%) of the subjects were consuming only two or less major meals per day. Regular intake of non-vegetarian food was documented in only 4.5%, snacks were taken by about one-third (36.8%). Boys were given a preference for milk and non-vegetarian foods.<sup>12</sup>

**Conclusion:** Adolescents have poor dietary habits and most of them as seen in different studies among different parts of country are consuming less calories and protein than the recommended dietary allowances. As dietary habits and food choices of adolescents will have large impact on their long term health appropriate guidance and importance regarding regular food consumption and choosing the right food may have a large impact on improving their overall health status.

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