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Original Research Article

Assessment of the nutritional status and dietary practices of the adolescents in the urban field practice areas of Trichy SRM Medical College and Research Centre

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ABSTRACT

Background: Malnutrition is still prevalent globally with the coexistence of both overnutrition and undernutrition in developing countries affecting people of all ages. Adolescents are particularly at risk of malnutrition due to rapid growth and development and changes in dietary habit that influences their nutrient intake. Dietary and other lifestyle behaviors formed during adolescence contribute to adulthood behaviors. This study therefore aimed at assessing the dietary practices and nutritional status of adolescents in urban field practice areas of Trichy SRM Medical College and Research Centre.
Methods: This wass a cross-sectional study with a sample size of 191, conducted in urban field practice areas of Trichy SRM Medical College and Research Centre. The adolescents (11 to 19 years) are the study participants, and a simple random sampling method was followed to recruit the study population. A pretested semi structured questionnaire containing variable details and anthropometric measurements were taken. The chi-square test was used to find the association between different variables and malnutrition.
Results: Among the study population 137 (71.7%) of the adolescents have calorie deficits with 24 hours recall method of food intake. Among the study population, 138 (72.3%) have normal BMI, 2 (1%) were overweight, 29 (15.2%) were thin and 22 (11.5%) are very thin.
Conclusions: Malnutrition is still persistent in the adolescent population which should to addressed with additional specific interventions focusing on this age group. Focused interventions to improve appropriate calorie intake are to be initiated at the community and school level.

Keywords: Adolescents, Anthropometric measurements, BMI, Calorie intake, Malnutrition

INTRODUCTION

Adolescence is a stage of human development encompassing the transition from childhood to adulthood. The term adolescence is derived from the Latin word "adolescere" meaning "to grow up". The World Health Organization (WHO) defines adolescents as individuals aged 10-19 years.[1] Adolescence is often divided into early (10-13 years), middle (14-16 years), and late (17-19 years) adolescence.[2] Adolescence, a period of transition between childhood and adulthood is a significant period of human growth and maturation.[3] It is the time when the nutrient requirements of the body are high.[4] This period has also been identified as a period of potential interest in correcting nutritional imbalance and insufficient growth from childhood.[5] Adolescents are the future generation of any country in the world. Their health has been neglected because they are considered not more vulnerable to diseases compared to young children or old people. Most health programs are mainly focused on childhood health problems, antenatal, and lactating mothers.[6]

Adolescence is a crucial period in life where a person starts to take their own decisions. Their dietary habits are influenced by peers, mass media, social and cultural norms, and lack of nutrition knowledge, while the influence of the family tends to decline.[7] Hence the habits especially in eating will remain in their future adult period. The dietary habits eventually affect their nutritional status.[8] Available literature suggests that energy imbalance between calorie intake and output is associated with malnutrition.[9] Inadequate nutrition intake in adolescents can put them at high risk of chronic diseases. Malnutrition still persists among various age groups despite the implementation and functioning of various National nutritional programs.[10]

Dietary and other lifestyle behaviors formed during adolescence contribute to adulthood behaviors. This study therefore aimed at assessing the dietary practices and nutritional status of adolescents in urban field practice areas of a medical college in central Tamil Nadu. The Objectives of the study were to assess the nutritional status of adolescents and to find the dietary practices of adolescents in the urban field practice areas of Trichy SRM Medical College and Research Centre.

METHODS

This is a cross-sectional study conducted in Urban field Practice areas of a medical college in Central Tamil Nadu. The study was conducted from June 2022 to September 2022. The sample size was 191 by using the formula $4pq/d^2$ where p is 42% q is (1-p) which is 58 and d is 7.5%. All adolescents of age 11 to 19 years residing in the Urban field practice areas of the study institution were included as the study population. Among these adolescents, those who were willing to participate in the study were included and unwilling adolescents and those with chronic diseases and any congenital deformities were excluded. The list of all eligible adolescents residing in the urban area as per the inclusion and exclusion criteria was prepared and simple random sampling was done to recruit the study population.

Body weight was measured (to the nearest 0.5 kg) with the subject standing motionless on the weighing scale. Height was measured (to the nearest 0.5 cm) with the subject standing in an erect posture against a vertical scale and with the head positioned so that the top of the external auditory meatus was level with the inferior margin of the bony orbit. The nutritional status of the adolescents was assessed through BMI for age according to WHO criteria.[11] Calorie assessment was done by 24 hours recall method. The students were interviewed about the food intake of the last 24 hours and a nutritional assessment was done for the same.

A pre-tested semi-structured questionnaire comprising questions related to sociodemographic variables, and dietary practices were asked and an anthropometric assessment was done. Informed assent was obtained from the adolescents after explaining the nature of the study. The questionnaire was used to collect the information from the students by interview technique. Ethical committee clearance was obtained from the institution's ethical committee.

The collected data were analysed using SPSS software version 24.0. Continuous variables were presented as mean and standard deviation (SD), while categorical variables are presented as numbers and percentages. The chi-square test was used to know the association between different variables and malnutrition. P value <0.05 was significant.

RESULTS

Out of 191 study participants, males are relatively high in number when compared to the females. The mid adolescents (51.3%) compromise a major strength compared to the early and late adolescents. Most of the study participants (56% in high and higher secondary education. According to modified BG prasad scale class II socioeconomic class participants (57.1%) were majority in number. Most of the adolescents live in the nuclear family (53.4%). 71.7% of the study participants have a calories deficit in 24 hours recall method of food intake. Skipping the meals (61.3%) and taking junk foods (90.1%) were commonly seen in the study participants. Table 1 describe the details of the sociodemographic characteristics of the study population.

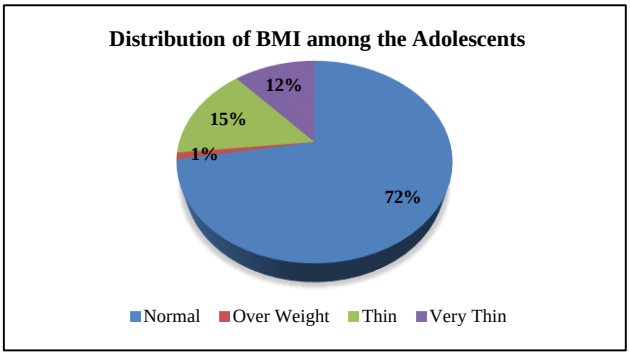

Figure 1: Distribution of BMI among the study population according to WHO classification.

Table 2 describes the association of calorie intake of the study population with other variables. Age of the adolescents, sex, grade of education, and skipping of meals were found to be associated with the calorie intake of the study population The calorie deficit was more in the early adolescents which was 70 (82.3%). The male adolescents (92.2%), adolescents from joint families (69.6%), and those who skip meals (63%) were found to be calorie deficient compared to the others.

Figure 1 gives the details of the distribution of the BMI category of adolescents. Among the study population, 138 (72.3%) have normal BMI, 2 (1%) were overweight, 29 (15.2%) were thin and 22 (11.5%) were very thin.

Table 1: Sociodemographic characteristics of the study population.

Variables and category	Frequency (N=191)	Percentage
Age (in years)		
Early	84	44
Mid	98	51.3
Late	9	4.7
Grade		
High and higher	107	56
Middle	84	44
Sex		
Female	88	46.1
Male	103	53.9
Socio-economic class		
Class I	4	2.1
Class II	109	57.1
Class III	75	39.3
Class IV	3	1.6
Class V	0	0
Family Type		
Nuclear	102	53.4
Joint	89	46.6
Calorie intake		
Adequate	54	28.3
Deficit	137	71.7
BMI category		
Normal	138	72.3
Overweight	2	1.0
Thin	29	15.2
Very thin	22	11.5
Meals skipped		
No	64	33.5
Yes	127	66.5
No. of meals skipped		
One Time	117	61.3
Two Times	10	5.2
Junk food		
No	19	9.9
Yes	172	90.1
Outside food		
No	130	68.1
Yes	61	31.9

Table 2: Comparison of sociodemographic variables with the calorie intake of the study population.

Variables and category	Calories adequate (%)	Calories deficit (%)	CHI-square value	P value
Age (in years)				
Early	14 (16.7)	70 (82.3)		
Mid	5 (55.6)	4 (44.4)	11.6	0.003*
Late	35 (35.7)	63 (64.3)		
Sex				
Female	46 (52.3)	42 (47.7)		
Male	8 (7.8)	95 (92.2)	46.35	0.00*
Grade				
High and higher	40 (37.4)	67 (62.6)		
Middle	14 (16.7)	70 (83.3)	9.96	0.02*

Continued.

Variables and category	Calories adequate (%)	Calories deficit (%)	CHI-square value	P value
Socio-economic class				
Class I	2 (50)	2 (50)	4.07	0.254
Class II	35 (32.1)	74 (67.9)		
Class III	17 (22.7)	58 (77.3)		
Class IV	0 (0)	3 (100)		
Class V	0 (0)	0 (0)		
Family type				
Nuclear	23 (25.8)	66 (74.2)	0.486	0.297
Joint	31 (30.4)	71 (69.6)		
Meals skipped				
No	7 (10.9)	57 (89.1)	14.26	0.000*
Yes	47 (37)	80 (63)		
Junk food				
No	5 (26.3)	14 (73.7)	0.40	0.540
Yes	49 (28.5)	123 (71.5)		
Outside food				
No	43 (33.1)	87 (66.9)	4.634	0.38
Yes	11 (18.0)	50 (82)		
Total	54 (28.27)	135 (70.68)		

Table 3: Comparison of sociodemographic variables with the BMI of the study population.

Sociodemographic variables	BMI-normal N (%)	BMI-overweight	BMI-thin	BMI-very thin	Chi square value	P value
Age (in years)						
Early	47 (56)	1 (1.2)	17(20.2)	19 (22.6)	25.375	0.000*
Mid	9 (100)	0 (0)	0 (0)	0 (0)		
Late	87 (83.7)	1 (1)	12 (12.2)	3 (3.1)		
Sex						
Female	68 (77.3)	1 (1.1)	13 (14.8)	6 (6.8)	3.73	0.292
Male	70 (68)	1 (1)	16 (15.5)	16 (15.5)		
Grade						
High and higher	91 (85)	1 (0.9)	12 (11.2)	3 (2.8)	24.107	0.000*
Middle	47 (56)	1 (1.2)	17 (20.2)	19 (22.6)		
Socio-economic class						
Class I	3 (75)	0 (0)	0 (0)	1 (25)	11.214	0.261
Class II	8(78.9)	0 (0)	14 (12.8)	9 (8.3)		
Class III	46 (61.3)	2 (2.7)	15 (20)	12 (16)		
Class IV	3 (100)	0 (0)	0 (0)	0 (0)		
Class V	0 (0)	0 (0)	0 (0)	0 (0)		
Family type						
Nuclear	75 (73.5)	1(1)	16 (15.7)	10 (9.8)	0.654	0.884
Joint	63 (70.8)	1(1.1)	13 (14.6)	12 (13.5)		
Meals skipped						
No	26 (40.6)	0 (0)	22 (34.4)	16 (25)	52.87	0.000*
Yes	112 (88.7)	2 (1)	7 (5.5)	6 (4.7)		
Junk food						
No	13 (68.4)	1 (5.3)	3 (15.8)	2 (10.5)	3.648	0.302
Yes	125 (72.7)	1 (0.6)	26 (15.1)	20 (11.6)		
Outside food						
No	100 (76.9)	2 (1.5)	16 (12.3)	12 (9.2)	6.234	0.101
Yes	38 (62.3)	0 (0)	13 (21.3)	10 (16.4)		
Calorie intake						
Adequate	49 (90.7)	2 (3.7)	1 (1.9)	2 (3.7)	21.440	0.302
Deficit	89 (65)	0 (0)	28 (15.2)	20 (14.6)		

*P value significant

Table 3 gives the details of the association of the variables with the BMI status of the study population. Among the study population, age of the adolescents, grade of their education, and meals skipped by them were found to be associated with BMI status of the adolescents.

DISCUSSION

In the present study, the proportion of mid-adolescents is 51.3% which is similar to the studies done by Anantha Narayana et al, from North Karnataka and Gebrehiot et al, from North-eastern Ethiopia where the mid-adolescents were more in number and which is contrast to the studies done by Singh et al, a hospital-based study done in Uttar Pradesh, and Subhashini et al, a study in rural Coimbatore where the early adolescent proportion is more 47% and 53.1% respectively.[12-15] But the study done by them shows mid adolescent proportions were more in their studies.

In the study population of the present study, the proportion of male was more than the females which are similar to the studies conducted by Ganesan et al, and Narayana et al. The majority of the study population were from the nuclear family which is similar to the study done by Narayana et al.[13,14]

In our study, 72.3% of the adolescents had normal BMI which is similar to the studies done by Ganesan et al, Gebrehiot et al, and Fathima et al, where 63%, 83.4% and 59% of the adolescents had normal BMI respectively.[14-16]

In current study, 17.8% of the adolescents were thin as per their BMI which is almost similar to the studies done by Ganesan et al, (19%), Narayana et al (15.8%) and Gebrehiot et al, (15.2%).[13-15] The proportion of adolescent who were very thin was 11.5% in our present study which is similar to Narayana et al, in which it was 13%. Also, the overweight category was 1% in our present study which is similar to Gebrehiot et al, which was 0.8% were overweight. In contrast to the proportion of overweight adolescents in these studies, Narayana et al, and Fathima et al, has reported a higher proportion of adolescent's overweight which was 4.8% and 13.97% respectively.[13-15]

In our present study, 66.5% had skipped their meal which is similar to the study by Ganesan et al, where 79.4% of adolescents skipped meals. In contrast to this, in the study done by Gebrehiot et al, it was 18.2%.[14,15]

Eating Junk foods in Ganesan et al from Coimbatore was 83.3% which is similar to the present study which was 90.1%.[13]

In our present study, the age of the adolescents, grade of the adolescents, and skipping of meals are found to be associated with BMI of the adolescents whereas, the factors such as family size, birth order, and poverty line were associated in a study by Narayana et al, and occupation of the mother, number of meals per day were associated with BMI in another study by Ganesan et al.[13,15]

Limitation of this study is that since the study was a cross-sectional design, it provides only a snapshot of the current nutritional status of the study population which shall be improved with prospective studies. The second limitation is that the outcome of the present study relied on self-reporting of the dietary practices which is subjective and hence appropriate dietary practices could not be assessed.

CONCLUSION

The present study has analysed the nutritional status and dietary intake of adolescents. The dietary intake analysed by the 24 hours recall method reveals that there is a deficit in calorie intake among adolescents. The prevalence of malnutrition in the present study was 28%. Malnutrition still persists in the adolescent population which has to be given more focus so as to create a healthier future generation. The results of the present study will be useful for policymakers to formulate various developmental and healthcare programs. Additional nutritional interventions are also needed to improve the present status of malnutrition among adolescents.

The studies assessing the dietary intake and calorie values of adolescents are very minimal and hence we recommend further studies on the assessing dietary intake of the adolescent.

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