The Nutritional Status of Grade Eleven Students In The Medical Officer of Health Area Kalutara.

S De Silva [1]

Abstract

Objectives:
To describe the nutritional status of grade eleven school children in the Medical Officer of Health (MOH) area Kalutara.

Methodology:
A descriptive cross-sectional study was carried out among grade eleven school children in Type 1AB and Type 1C state schools in the MOH area Kalutara. Eighteen classes from a total of 14 schools were studied. Cluster sampling technique, probability proportionate to size was used to select the sample. The heights and weights were measured, and the Body Mass Index (BMI) was calculated for each child. The age and sex specific BMI charts developed by the National Centre for Health Statistics 2000 were used as standards. A structured, pre-tested self-administered questionnaire was used to collect the socio-demographic characteristics.

Results :
The prevalence of thinness ($<5^{th}$ percentile) was 35.4% and the prevalence of being at risk of overweight ($\geq 85^{th}$ percentile) was 6.7%.

Conclusions:
Under-nutrition is a problem among grade eleven school children in the MOH area Kalutara. Almost 7% of them were at risk of overweight.

Key Words:
Nutritional Status, School Children

Introduction

The nutritional status of a population determines the overall health status which affects the growth and development of a society (1). The recent decade has experienced marked changes in demography, epidemiology, and nutrition, which is more prominent in the developed countries, yet with no exception in the developing countries. Nearly 46% of the global burden of disease and 56.5 million total deaths reported in the year 2001 have been attributed to chronic diseases (2)**.** Sri Lanka too has experienced rapid urbanization with 21.5% of the population being urban (3), and with changes in the food consumption pattern.

Adolescents, the age group between 10 -19 years (4)**,** represents the future work force of the nation. This is a critical period where more than 20% of the total growth in stature, and up to 50% of adult bone mass is achieved (5). Adolescents in Sri Lanka constitute 3.7 million (19.7%) according to the Department of Census and Statistics (6). In Sri Lanka both under-nutrition and over-nutrition prevail among the adolescents. The prevalence of thinness ranges from 12.3% - 47.2% and the prevalence of overweight ranging from 2.2% - 15.2% (7, 8) depending on the setting of the study.

Methodology

This study was a cross-sectional descriptive study conducted in MOH area Kalutara, in the administrative area of the National Institute of Health Sciences (NIHS). This is situated 40 kilometers south of the city of Colombo. The estimated population was 120,776 for the year 2006 and the area spans 76 square kilometers. This area is a part of Kalutara district where the urban rural population ratio is 1: 8.41(9).

The study population consisted of all children enrolled in grade eleven classes in the government schools in the type 1AB and 1C schools in the MOH area Kalutara. There were 14 schools of the above type with 35 classes out of which 18 were chosen for the study by cluster sampling done according to probability proportionate to size during a period of a 3 weeks starting from mid September 2006.

A data sheet was used to record the anthropometric measurements, date of birth and the sex of the child. The latter two data were extracted from the class register. A structured self-administered questionnaire (SAQ) was used to collect information on socio-demographic and economical variables. The SAQ was translated to Sinhala and was pre-tested in

1. S De Silva, Lecturer, Department of Community Medicine, University of Colombo.

a school in the adjoining MOH area. Retired Public Health Nursing Sisters (PHNSs) and area Public Health Inspectors (PHIs) and two medical officers assisted the principal investigator (PI) in data collection. The PHNSS were trained in taking anthropometric measurements, and the area PHII assisted them. Standard procedures in making the measurements were demonstrated by the PI and the data collectors were trained each for two hours on two days.

Body weight was measured with an accuracy of ± 100g using the electronic weighing scales, and the standing body height was measured to the nearest 0.1cm using a height measuring board. Both instruments were calibrated. The instruments were obtained from the Nutrition Department of the Medical Research Institute. Duplicate measurements were taken by the PI in 10% of the sample to ensure reliability of data.

Ethical clearance for the study was obtained from the Ethical Review Committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura.

Analysis was done using the SPSS version 13.00. The nutritional status was assessed using the age and sex specific body mass index (BMI) calculated using the height and the weights of the children.
BMI = Weight (Kg) /Height ^{2} (m^2)

The National Centre for Health 2000 (10) reference values and World health organization cutoff (4) were used for categorization. Those below the 5th percentile were categorized as Thin while those at risk of overweight were those at the 85th percentile and above.

Results

The study included 639 school children where the great majority were Sinhalese (99.5%, n= 636), Buddhists (95%, n=607). There were no Tamils or Hindus. Females accounted for 55.7% (n=356) of the sample. Most (84.8%, n=542) of the students were residing in rural areas. The mean age of the study sample was 16.1(SD±0.4) years. The age range was 15.5 to 18.5 years.

More than half (58.4%; n=373) the children belonged to social class 4 and 5, and those in social class 1 & 2 constituted 20.8% [n=133]. The social class was measured by the occupation of the father (11). Seventy nine percent (n=502) of the children were able to record their monthly family income and 265 families had a monthly income of less than 10,000 rupees. Ninety eight percent [n=627] of the students were residing in there own homes where as 12 (1.9%) were residing outside home (Table 01).

Table 1: Description of the study sample

Variable (n=639)	No	%
Sex		
Female	356	55.7
Male	283	44.3
Residence by sector		
Rural	542	84.8
Urban	97	15.2
Ethnicity		
Sinhalese	636	99.5
Non Sinhalese	3	0.5
Religion		
Buddhism	607	95.0
Non Buddhist	32	5.0
Social class		
Class 1 &2	133	20.8
Class 3	133	20.8
Class 4 & 5	373	58.4
Total monthly family income		
< 10,000	265	41.5
>=10,000	237	37.1
Do not know	137	21.4

The prevalence of thinness was 35.4% (n=226) and prevalence of being at risk of overweight was 6.7% (n=43). Out of the males 43.8% (n=124) were in the thinness category compared to the girls (28.7%, n=102). Among those at risk of overweight, females (8.7%, n=31) had a higher prevalence than the males (4.3%, n=12). This finding was statistically significant (p=0.0001).

More of the rural children were in the thinness category (36.3%, n=197) and more urban students were at risk of overweight (10.3%, n=10), yet not statistically significant. Although there was no statistically significant difference between the nutritional status and parental factors, a higher proportion of thinness was observed when the mothers did not reside with the children and where mothers' education was less than G.C.E. O/L [Table 2].

Table 2: Distribution of the nutritional status of the children according to socio demographic and parental factors

Variable	Nutritional Status						Total	Test of signifi-cance
	Thinness		Normal		At risk of overweight			
	No	%	No	%	No	%	No	
Sex								χ^2 =19.9
Female	102	28.7	223	62.6	31	8.7	356	df=2
Male	124	43.8	147	51.9	12	4.3	283	P=0.0001
Residence by sector								
Rural	197	36.3	312	57.6	33	6.1	542	χ^2 =3.2
Urban	29	29.9	58	59.8	10	10.3	97	df=2 p=0.2
Social class								
Class 1 & 2	48	36.1	73	54.9	12	9.0	133	χ^2 =3.97
Class 3	45	33.8	76	57.1	12	9.0	133	df=4
Class 4 & 5	133	35.8	221	59.1	19	5.1	373	p=0.41
Monthly family income								
< Rs 10,000	107	**40.4**	149	56.2	9	3.4	265	χ^2 =11.53
>= Rs 10,000	77	32.5	137	57.8	23	9.7	237	df=2
Do not know *	42	30.7	84	61.3	11	8.0	137	p=**0.021**
Employment status of father								
Employed	201	36.2	316	56.8	39	7.0	556	χ^2 =4.12
Not employed	8	32.0	17	68.0	0	0	25	df=4
Retired	10	29.4	23	67.6	1	2.9	34	p= 0.39
Do not know *	3	29.2	14	58.3	3	12.5	24	
Education level of the mother								
< G.C.E. O/L	129	**37.6**	195	56.8	19	5.6	343	χ^2 =3.54
> G.C.E O/L	79	32.9	139	57.9	22	9.2	240	df=2
Do not know *	18	32.1	36	64.3	2	3.6	56	p=0.17
Presence of parents at residence								
Both present	200	35.4	327	57.9	38	6.7	565	χ^2 =3.68
Father only present	7	41.2	10	58.8	0	0	17	df=6
Mother only present	11	28.2	25	64.1	3	7.7	39	p=0.719
Both not present	8	44.4	8	44.4	2	11.2	18	
Total	**226**	**35.4**	**370**	**57.9**	**43**	**6.7**	**639**	

Discussion

Nutrition of adolescents is the cornerstone of a healthy nation. In the nutrition policy special emphasis has been given to promote the nutritional status of the youth by appropriate behavioural change communication that promotes healthy food habits and adequate physical activity (14).

As compared to a study carried out among adolescents in urban schools in the Colombo district (7) where the prevalence of thinness was in the range of 15.6% to 29% depending on the age category, the present study shows a higher prevalence of thinness (35.4%). Both studies show that the prevalence of thinness was higher among the boys indicating the need for a targeted approach for the different sexes. The inclusion of private schools and the level of urbanization may have contributed to the low level of thinness in the Colombo district.

The present study revealed that 6.7% of children were at risk of overweight with a male to female ratio of 1:3.7. In the national study (8**)** those at risk of overweight was 2.2% with the above ratio being 1:1.6. It is no secret that with the change of life styles and the level of urbanization overweight is becoming a problem in many parts of the world including the developing nations (13). This leads to the double burden of both under nutrition and obesity. Global prevalence of overweight and obesity in school aged youth from 34 countries in the year 2001-2002 have shown that the two countries with the highest prevalence of overweight was Malta (25.4%) and the United States of America (25.1%) (14). Even in India a considerable increase in the prevalence of overweight is seen over the past 20 years (13).

The higher prevalence of thinness in the rural children and higher prevalence of at risk of overweight in the urban children was seen in the present study which is comparable with the national study (8). Thinness was observed more in the student in poor income families. This association was statistically significant and similar associations are seen in other studies done in Sri Lanka (7). The association of poor nutritional status with thinness indicates that the household food purchasing power maybe a contributing factor for the nutritional status of the adolescents.

Parents are the main source of influence for growth and development of the children especially during infancy and childhood. They have significant effects on the adolescent nutritional status as well, as they are the providers of food and other resources, although there is some element of independence in the dietary habits in adolescents (15). In the Sri Lankan setting parents may play a bigger role with reference to the diet of the children than in the western world. A statistically significant association was observed in our study between the nutritional status and the education level of the mother indicating the possible parental influence on adolescent nutrition.

Conclusions

Under-nutrition (35.4%) is a problem among grade eleven school children in the Kalutara Medical Officer of Health area. Almost 7% of them were at risk of overweight. The nutritional status showed statistically significant associations with the sex of the child and the monthly family income.

Acknowledgements

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