Available Online at www.jddt.in

ISSN: 2320 - 4230

Journal of Drug Discovery and Therapeutics 2 (22) 2014, 39-42

RESEARCH ARTICLE

A study on nutritional status of adolescent girls with reference to BMI among school going adolescent girls, Chidambaram.

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Received 28 September 2014; Accepted 7 October 2014

ABSTRACT

Introduction: Adolescence is a crucial period of important distinctions together with physiological, physical, behavioral and social changes. Under-nutrition among adolescent girls is a major public health problem unsound food habits and lack of nutritional awareness are considered to be the main factors in determining nutritional status.

Objective:

1) To assess the nutritional status of adolescent girls using Body mass index.

2) To study the influence of physical activity on body mass index.

Methodology: Cross sectional study was carried out on 930 school going adolescent girls, Chidambaram. Nutritional status was assessed by Body Mass Index and pretested proforma was used to find out the physical activity. The study was conducted in four higher secondary schools in Chidambaram.

Results: Overweight and obesity in adolescent girls was 8.49% and 2.26% respectively. Significant association was seen between increase in Body Mass Index and not having adequate physical activity.

Conclusion: Physical activity has an influence on occurrence of overweight and obesity in adolescent girls. Life style modification must be advised to prevent its occurrence.

Key words: Adolescent, physical activity, overweight, obesity.

INTRODUCTION:

Adolescence is a crucial period of important distinctions together with physiological, physical, behavioural and social changes. [1]WHO considers adolescence to take place between ages ten to nineteen, whereas in India it is slightly lower and has been reported to be around 12 years (Khadilkar VV et al. 2006, Chumlea WC et al. 2003). Adolescent gain 50% of adult weight and more than 20% of their adult height during this period.[2]

Under-nutrition among adolescent girls is a major public health problem leading onto impaired growth and nutritional anaemia, etc. On the other hand Obesity rates also are rising in all states, races, age groups, and for both men and women. Unsound food habits and lack of nutritional awareness are considered to be the main factors in determining nutritional status. Despite the increasing public awareness of the detrimental health effects of being overweight, the number of obese adolescents has tripled. There are many potential pathways through which sociodemographic variables may impact overweight in youth. One important pathway may be physical activity.

Globally, in 2010 the number of overweight children under the age of five is estimated to be over 42 million. In addition to physical inactivity, sedentary behaviors may play an important role in the association between sociodemographic factors and overweight in adolescence. WHO defines physical activity as any bodily movement produced by skeletal muscles that require energy expenditure – including activities undertaken while working, playing, carrying out household chores, travelling, and engaging in recreational pursuits. Approximately 3.2 million deaths and 32.1 million DALYs (representing about 2.1% of global DALYs) each year are attributable to insufficient physical activity. Insufficient physical activity is the 4th leading risk factor for mortality. People who are insufficiently physically active have a 20% to 30% increased risk of all-cause mortality compared to those who engage in at least 30 minutes of moderate intensity physical activity most days of the week. Both, moderate and vigorous intensity physical activity brings

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health benefits. In order to be beneficial for cardio respiratory health, all activity should be performed in bouts of at least 10 minutes duration. WHO recommends for children and adolescents at least 60 minutes of moderate to vigorous intensity activity per day. Overweight and obesity, as well as their related diseases, are largely preventable. Prevention of childhood obesity therefore needs high priority. Childhood obesity is mainly associated with unhealthy eating and low levels of physical activity, Childhood is a target period for prevention for several reasons; (i) obesity tends to track, so that fatter children are more likely to become fatter adults, (ii) evidence is accumulating that children, like adults, suffer from adverse health consequences relating to their obesity, (iii) children may be more amenable to intervention strategies than adults.[5-7]

With this background this study was conducted

OBJECTIVES:

1) To assess the nutritional status of adolescent girls using Body mass index.

2) To study the influence of physical activity on body mass index.

MATERIALS AND METHODS:

The descriptive cross sectional study was conducted in 4 higher secondary schools in the urban field practice area of RMMC in Chidambaram. The sample size of 930 was calculated from the prevalence of overweight and obesity (13.5%) reported in previous study by Rawat R et al. using the formula $n=4pq/l^2$.The study was carried out for the period of one year from June 2013 to June 2014. School authorities were explained regarding the purpose of the study. A good rapport was built up and confidentiality guaranteed so as to collect more reliable answers from them. The girls were interviewed separately and privately. Bathroom weighing scale, vertical scale and proforma were used for the study .Body weight was measured with the subjects standing on the weighing scale with feet 15 cm apart .The zero error was checked for and removed if present before each reading . Their weight was recorded to the nearest 500 grams. 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 scale was brought down to the topmost point on the head. The height was recorded to the nearest 0.5 cm. Body mass index of each participant was computed by using, the formula

$$\frac{\text{Weight (kg)}}{\text{Height (m}^2\text{)}}$$

Investigator administered interview was conducted. The data was collected in a predesigned, pre-tested semi structured questionnaire with both open and closed ended questions. The questionnaire was verbally interpreted in simple language and properly explained to avoid any form of misunderstanding and to facilitate accurate response by the subjects. The study variables were age , parents educational status, occupational status, monthly family income, habit of physical activity , habit of physical exercise (in hours).

Data were coded, revised and analyzed using computer programme SPSS /PC Version 20.0. The statistical tests used to determine the attributes include mean and standard deviation, percentages and independent't' test. *P* values less than 0.05 were considered significant to test for significance level.

RESULTS:

This study was conducted among 930 school going adolescent girls. Table 1 shows that around 34.4% students belong to 13 years of age followed by 23.2% in the age group of 14 years. Table 2 shows the nutritional status of adolescent girls according to standard international classification of BMI. The prevalence of underweight, normoweight, overweight and obese is found to be 44.52%, 44.73%, 8.49% and 2.26% respectively. Of the total 930 subjects 824 (88.6%) reported habit of physical activity such as helping in household maintenance, washing clothes etc.

Table 3 reveals the correlation of mean and standard deviation of anthropometry with physical activity. The significant 'p' value for BMI and Weight infers that both BMI and Weight statistically differ by the habit of physical activity.

DISCUSSION:

In the present study, 44.5% of adolescent girls were undernourished based on BMI which coincides with the results 46% reported by Alinda M. Bosch *et al*. [8] whereas studies carried out in a rural area of Bhopal district by Sheloj M Joshi *et al*. [9], in a rural area of Kolar district by H.R.Shivaramakrishna *et al*.[13] and in Lucknow by Rajaat Vohra *et al*. [10] among adolescent girls observed 71.2% ,73.5% and 60.4% of undernourishment respectively. The reason could be that these studies have been carried out in various rural areas. Goyle A *et al.* and Soumyajit Maitistudy *et al*. studied malnutrition among girls using weight / age criteria and found that 72.8% of girls were suffering from various degree of malnutrition [11, 12]. There are studies which demonstrated lower prevalence of undernourishment among the adolescent girls varying from 5.03% to 27.9% by Maiti S *et al*.[14] in Urban and Rural

adolescent girls of West Bengal and Francis *et al.*[15] in Nigeria.

The current study attempted to find out the association between physical activity and Body Mass Index. There was a decrease in the Body Mass Index with increase in physical activity. This was found to be statistically significant. Similar finding was observed by Sulemana H *et al*.[10] in their study on relationship between physical activity and body mass index in adolescents. (r=-0.37; P<0.05); Samia Mora *et al*.[16] in their study to find the association of physical activity and

Body Mass Index reported independent association between lower levels of physical activity and higher levels of BMI (*P* for trend <.001). Another longitudinal study conducted by Tessa J Parsons *et al*.[17] reported less gain in BMI with increase in physical activity.

Table 1: Distribution of students according to age

AGE (YRS)	FREQUENCY(N)	PERCENTAGE (%)
11	25	2.7
12	182	19.6
13	320	34.4
14	216	23.2
15	131	14.1
16	56	6.0
TOTAL	930	100.0

Table 2: Body mass index of the study population

BMI	N	PERCENTAGE (%)
<18.5	414	44.52
18.5-24.99	416	44.73
25-29.99	79	8.49
>30	21	2.26
TOTAL	930	100.00

Table 3: Mean and standard deviation of anthropometry by habit of physical activity

HABIT OF PHYSICAL ACTIVITY		N	MEAN	STD.DEVIATION	t-TEST	p-VALUE
BMI	No	106	21.17	4.32871	3.730	<0.001
	Yes	824	19.59	4.07172		
Ht	No	106	149.40	6.5621	0.513	0.608
	Yes	824	149.05	6.3315		
Wt	No	106	47.34	10.6511	3.531	<0.001
	Yes	824	43.64	10.0780		

REFERENCE:

1. Shila Benenjy , relation of obesity and menarche age among adolescent students . Journal of family and reproductive health vol.2,No.4,Dec2008
2. A.Acharya et al Nutritional status and menarche in adolescent girls in an urban resettlement colony of South Delhi,IJCM,Vol31,No.4,2006.
3. Whincup PH, Gilg JA, Odoki K, Taylor SJ, Cook DG. Age of menarche in contemporary British teenagers: survey of girls born between 1982 and 1986. BMJ 2001; 322: 1095-6.
4. WHO fact sheet : Physical activity
5. Tessa J Parsons, Orly Manor and Chris Power. Physical activity and change in body mass index from adolescence to mid-adulthood in the 1958 British cohort: International Journal of Epidemiology 2006; 35:197–204

6. Power C, Lake JK, Cole TJ. Measurement and long-term health risks of child and adolescent fatness. Int J Obes 1997; 21:507–26.
7. Reilly JJ, Methven E, McDowell ZC et al. Health consequences of obesity. Arch Dis Child 2003; 88:748–52.
8. Alinda Bosch, Frans Willekens, Abdullah Baqui, Jeroen van Ginneken, Inge Hutter A Life Course Study about Menarche Made Feasible by the Health and Demographic Surveillance System in Matlab, Bangladesh: PAA, Annual Meeting 2006.
9. Sheloj M Joshi, Swarna Likhar, Sanjay S Agarwal, Mahesh Kumar Mishra, Umashankar Shukla . A Study of Nutritional Status Of Adolescent Girls In Rural Area Of Bhopal District: National Journal of Community Medicine | Volume 5 | Issue 2 | Apr – June 2014
10. Sulemana H, Smolensky MH, Lai D. Relationship between physical activity and body mass index in adolescents.
11. Goyle A. Nutritional status of girls studying in a government school in Jaipur city as determined by anthropometry. Anthropologist 2009; 11: p225-227.
12. Soumyajit Maiti, Kauhik Chattterjee, Kazi Monjur Ali, Debidas Ghosh, Shyamapada Paul. Assessment of nutritional status of rural early adolescent schoolgirls in dantan-iiblock, paschim medinipur district, West Bengal. National Journal of Community Medicine 2011;2(1): p14-18
13. *H.R. Shivaramakrishna, A.V. Deepa and M. Sarithareddy. Nutritional Status of Adolescent Girls in Rural Area of Kolar District -A Cross-Sectional Study. Al Ameen Journal Medical Science. 2011; 4 (3): 243-246.*
14. Maiti S, Ali KM, De D, Bera TK, Ghosh D, Paul S.A Comparative Study on Nutritional Status of Urban and Rural Early Adolescent School Girls of West Bengal, India :J. Nepal Paediatr. Soc. -169-September-December, 2011/Vol 31/Issue 3
15. Francis A, Seline O, Angela O. Nutritional Status of Newly Enrolled Primary Schoolchildren in Jos-Plateau, Nigeria. Pak J Nutr 2010;9: 1166-70
16. Samia Mora, MD, MHS; I-Min Lee, MBBS, ScD; Julie E. Buring, ScD; Paul M Ridker, MD, MPH. Association of Physical Activity and Body Mass Index With Novel and Traditional Cardiovascular Biomarkers in Women: *JAMA.* 2006; 295(12):1412-1419. doi:10.1001/jama.295.12.1412.
17. Tessa J Parsons , Orly Manor, and Chris Power. Physical activity and change in body mass index from adolescence to mid-adulthood in the 1958 British cohort.

