Risk factors for Non Communicable Diseases (NCD) among High School Students in an Urban Setting

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Research Article

Abstract: Non Communicable Diseases (NCD) are showing an increasing trend especially in the developing countries. These countries are at an economic and nutrition transition. The rise in NCDs is mainly attributed to change in dietary habits, sedentary lifestyles and increasing obesity. The key to the control of epidemics of NCD's is primary prevention. The basis of prevention of NCD's is therefore identification of the major risk factors and their prevention and control. The objective of the present study is to assess selected risk factors for Non Communicable Diseases among High School children in Guntur city of Andhra Pradesh. Information concerning the life styles and potential risk factors for the Non Communicable Diseases was collected by a self administered questionnaire which was developed based on the WHO STEPS questionnaire and the Global School Health Survey (GSHS) questionnaire. A total of 925 high school children participated in the study. The prevalence of overweight and obesity in the present study are 4.3% and 1.7% respectively. A high prevalence of factors for Non communicable diseases have been observed i.e. taking carbonated drinks > three times per week (30.2%), exposure to cigarette smoke (75.5%), no physical activity (21.8%). The study suggests that awareness regarding risk factors by health education and interventions promoting healthy life style are important to prevent NCD's in future.

Key Words: Non Communicable Diseases, Risk Factors, High School Children, Body Mass Index (BMI).

1. Introduction

Non Communicable Diseases (NCD) overtook the communicable diseases as the leading cause of morbidity in the developed countries. South East Asian countries, like India, are now at an economic and nutritional transition [1]. The nutrition transition is associated with a change in the dietary habits, decrease in physical activity and rise in prevalence of obesity[2].Obesity in children and adolescents is gradually becoming a major public health problem in many developing countries, including India [3]. Even though the period of adolescence is considered morbid free, when compared with other age groups relatively, the change in life style at adolescence, projects the roots for causing non communicable diseases in adult life [4]. There are only a few studies reporting prevalence of adolescent obesity and over weight from different parts of India (Punjab, Maharashtra, Delhi and South India), ranging from 3 to 29% [5]. Non communicable diseases contributed 60% of deaths and 43% of global burden of diseases in the year 2002. By 2020, they are projected to count for 73% of deaths and 60% of disease burden [6]. Chronic diseases, in India, accounted for 53% of all deaths in 2005. Out of which 29% were due to Cardio vascular diseases alone [7]. Clearly non communicable diseases can no longer be regarded as a problem confined to developed countries. Life style related behavioural risk factors are mainly implicated for this increased burden and researches related to these risk factors among adolescents are essential [8].The main risk factors are emerging from improved transport, availability of energy saving devices and high levels of mental stress, which are associated with modernization. Fundamental cause for the risk factors is an energy imbalance, between calories intake and expenditure [9]. Increased BMI highlights the fact that, obesity is a central factor common to the problem of Hypertension, Diabetes and Coronary Heart Diseases [10]. Adolescent physical activity pattern, life style and dietary patterns are the most modifiable risk factors for non communicable diseases [11]. In view of the recent trends of rising non communicable diseases, assessment of prevalence of risk factors in adolescent school going children is necessary for early application of preventive measures. In view of the above scenario the present study was conducted to find out some selected risk factors for non communicable diseases in high school children in an urban setting.

2. Material & Methods

There are 10 municipal corporation high schools in Guntur out of which 4 schools have been selected by simple random sampling technique. All the students who were enrolled from 6^{th} to 10^{th} standard were included in the study. This was a cross sectional study conducted from August to October 2011. The study was approved by Institutional Ethics Committee of Katuri Medical College, Guntur. Permission to conduct the study was taken from the Heads of the schools. Students were explained about the purpose of the study and participation was voluntary. Anonymity

was assured and written informed consent was taken from each student before administering the questionnaire and physical examination.

2.1 Data Collection

Data was collected by a self administered questionnaire which was developed based on the WHO STEPS questionnaire [12] and the Global School Health Survey (GSHS) questionnaire [13]. The questionnaire was translated into regional language i.e. telugu and explained in detail to each and every student to avoid misinterpretations or wrong perception of the questions. The date of birth of students was obtained from the school records for their exact age. Information concerning the life styles and potential risk factors for the non communicable diseases of the students was collected. The questionnaire focused on intake of fruits and vegetables, consumption of fast foods and carbonated drinks , exposure to cigarette smoke and physical activity . Weight and height were measured and BMI was calculated according to the following formula

$$BMI = \text{weight (kg)}/\text{height (m)}^2$$

Participants were weighed with uniforms and without shoes, using electronic balance to the nearest 0.1 kg and height was measured by height measuring stand without shoes to the nearest 0.1 cm; BMI was categorized by ELIZ Health Pathway for Adolescents [14].

2.2 Data Analysis

The collected data was entered into Microsoft Excel Spreadsheet and analysed by using SPSS software version 16. Frequency for variables and risk factors was calculated in percentages. Results were summarised as tables in terms of proportions and percentages.

3. Results

3.1 Socio Demographic Characteristics

The socio demographic characteristics of study subjects are shown in Table 1.

Table 1: Socio demographic characteristics of study subjects (n=925)

	Number	(%)
Sex		
Male	606	65.5
Female	319	34.5
Class of Study		
VI	180	19.5
VII	130	14.0
VIII	191	20.6
IX	245	26.5
X	179	19.4
Age		
10	13	1.4
11	119	12.9
12	140	15.1
13	204	22.1
14	246	26.6
15	158	17.1
16 +	45	4.5
Social Caste		
Backward Classes	393	42.5
Scheduled Castes	255	22.0
Other Castes	204	27.6
Scheduled Tribes	73	7.9

Information was collected from a total of 925 high school students studying 6th to 10th class belonging to the selected schools. Out of these 606 (65.5%) were males and 319 (34.5%) were females. The mean age of the study participants was 13.32 ± 1.47 years. Majority (94.1%) of the participants were in age ranging from 11 – 15 years. By Social Caste 42.5% of students are belonging to Backward Classes.

3.2 Risk Factors for Non Communicable Diseases (NCD)

3.2.1 Dietary habits

Among the study subjects 862 (93.2%) were non vegetarian by food habits. The proportion of school children eating meat ≥ 3 times / week was 4.2%. The most common meat consumed was chicken (81.2%). Regarding consumption of fruits, 94.2% of the students were eating fruits but 62.1 % were taking ≤ 3 times / week. The proportion of students reporting vegetable consumption ≤ 3 times / week was 17.5%. In the present study, 30.2 % of children reported consumption of carbonated drinks ≥ 3 times / week. A high proportion of children (56.1%) reported consumption of fast foods ≥ 3 times / week.

3.2.2 Physical Activity

More than half of the study subjects (57.8%) do not have the habit of any physical exercise. In the present study, 21.8% of children reported that they spent < 1 hour / week in any outdoor games in the past week. Nearly one – third of the study participants (32.7%) reported that they spend > 3 hours / day watching television and 66% of the participants had the habit of watching television while eating food.

3.2.3 Body Mass Index

Body Mass Index was categorized by ELIZ Health Pathway for Adolescents (EPHA) (Table 2). According to EPHA [14], BMI <15 indicates underweight or chronic energy deficiency (CED), 15 – 22 indicates normal,>22 – 25 indicates overweight and >25 indicates obesity.

Table 2: Distribution of BMI among study participants by sex

BMI Category	Male	%	Female	%	Total	%
<15	192	31.70%	70	21.90%	262	28.30%
15 - 22	383	63.20%	223	69.90%	606	65.50%
> 22 - 25	24	4.00%	16	5.00%	40	4.30%
> 25	7	1.20%	10	3.10%	17	1.80%
Total	606	100.00%	319	100.00%	925	100.00%

The overall prevalence of overweight and obesity among school children in the present study are 4.3% and 1.8% respectively.

3.2.4 Exposure to cigarette / tobacco smoke

The pattern of exposure to cigarette / tobacco smoke is shown in Table 3.In the present study 75.5% of the students gave history of exposure to cigarette smoke in the past 1 week. The main source of exposure was from family members (61.4%), followed by neighbours and others (37.6%). Out of 606 male students 6 (0.9%) have given a positive history of smoking.

Table 3: Exposure to cigarette / tobacco smoke in the past week

H / O exposure	Number (%)
Present	698 (75.5)
Absent	227 (24.5)
Source	
Smoking among family members	429(61.4)
Neighbours and others	263(37.6)
Self	6(0.86)

4. Discussion

In the present study a high proportion (93.2%) of children were non vegetarian by food habits. The most common type of meat consumed was chicken (81.2%), followed by fish (4.4%). Fish is nutritious food rich in protein, practically devoid of any carbohydrate and rich in unsaturated fatty acids. In spite of all these benefits, the consumption of fish is very low among the school children in the present study. Fruits and Vegetables are classed as protective foods. They are good sources of vitamins and minerals. Majority of the study participants were consuming fruits (94.2%) and vegetables (97.4%) but the frequency of consumption of fruits was less i.e. 62.1% were taking fruits ≤ 3times / week. Almost similar proportions were reported among boys (61.3%) and girls (63.3%).In the present study, daily consumption of fruits was reported in 23% of the study participants. These findings were unfavourable in comparison to studies done in other Indian cities like Delhi [15] and Mangalore [16].

Regarding intake of vegetables, only 17.5% reported consuming vegetables ≤ 3times / week. Similar finding has been reported among high school students in Mangalore [16]. The proportion of school children drinking carbonated drinks ≥ 3 times / week was 30.2% and consumption of fast foods ≥ 3 times / week was 56.1%. All these factors have been associated with development of overweight and obesity as reported by other studies done in India [16] and other countries [17]. Reduced physical and sports activity and prolonged watching of television for > 2hrs were associated with obesity as reported from similar studies [11],[18] done in India. In the present study, 57.8% did not have the habit of any physical exercise. Nearly one – third of the study participants (32.7%) reported that they spend > 3 hours / day watching television. The combined prevalence of Overweight and Obesity in the present study was 6.1%.These findings are similar to those reported in a study done on among 12- to 17-year-old urban adolescents in Hyderabad, India [11]. However these figures were lower than that reported by a study done in public schools of Meerut [19] using the ELIZ pathway and other similar studies[20]-[22]. In the current study smoking was reported by 0.9% of boys. This was similar to that reported in Mangalore study[16].These findings need to be interpreted with caution as self reporting can be unreliable if the subject is under pressure because of social or medical disapproval and hence tends to provide socially desirable responses[23]. Hence there can be a chance of under estimation of the smoking status.

Data from the Global Youth Tobacco Survey (GYTS) from 132 World Health Organization (WHO) Member States shows that around half of all the students worldwide surveyed were exposed to tobacco smoke in home and outside the home. Among students from South-East Asia region of the WHO, exposure was 37% [24]. In the present study, 46.4% students were exposed to tobacco smoke at home and 28.4% students were exposed to SHS outside their homes. The Mumbai Student Tobacco Survey [25] reported only 16.5% students were exposed to SHS at home and 39.9% students were exposed to SHS outside their homes. It is known that those students, who have at least one parent who smokes, had reported more SHS exposure at home and outside home. This finding was already confirmed among students in GYTS 2008 South Africa survey [26]. Other studies also demonstrated that children who have a parent who smokes are more likely to smoke and to be heavier smokers at young ages [27], [28]. Even according to the Environmental Protection Agency, parents are responsible for 90% of children's exposure to SHS [29].

5. Conclusion

Our study reveals high burden of certain NCD risk factors school children and hence reiterates the need to address these issues comprehensively as a part of NCD prevention and control strategy. The consumption of nutritious foods such as fish meat, fruits and vegetables and dairy foods seem to low among school children where as unhealthy practices like fast food consumption and intake of carbonated drinks are high. Even though the problem of overweight and obesity are low, the risk factors like decreased physical activity, excess television watching are high which are well known causes for overweight and obesity. Educating parents that their smoking has harmful effects on their children would help in preventing children from exposure to tobacco smoke. School-based programs promoting healthy eating, increasing physical activity and cessation of smoking can go a long way in preventing the risk factors for Non communicable diseases in school age children.

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