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Original Research Article

Study of lifestyle disease risk factors among school going adolescents of urban Bareilly, Uttar Pradesh, India

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ABSTRACT

Background: The rising burden of preventable risk factors for life style diseases among adolescents is a major public health challenge worldwide. This study was conducted to identify the preventable risk factors for life style diseases in adolescents.
Methods: This cross-sectional study was undertaken amongst adolescents studying in senior secondary schools of urban Bareilly using purposive sampling. The students were surveyed through a self administered questionnaire after taking consent from their principal. Dietary practices, physical activity, tobacco and alcohol use were assessed. Blood pressure and body mass index were measured. The data was analyzed using SPSS software.
Results: Out of 250 participants, majority (62.0%) were males. Only 4.8% were currently using tobacco while 3.2% respondents admitted having consumed alcohol in last 30 days. Only 28.8% did brisk walking and cycling for at least 30 minutes continuously thrice a week. Nearly 22.4% were involved in moderate intensity sports while 20.4% in vigorous intensity sports. Nearly 5.6% regularly practiced yoga. About 52.4% were non vegetarians. Nearly 70.8% consumed adverse food items such as fried food, cheese, butter, meat, egg, sweetened drinks, pizza, burger, bakery items, pickles and sauces daily. Only 64% consumed fruits while 75.6% consumed vegetables for at least three days in a typical week. Also 24.4% added extra salt to cooked food items. The overall prevalence of hypertension was 12.0%. About 64.4% were underweight, while 7.6% were overweight.
Conclusions: Adoption of healthy lifestyles by all adolescents is critical for the prevention of lifestyle diseases.

Keywords: Adolescents, Lifestyle, Risk factors

INTRODUCTION

Adolescents are those between the ages of 10 and 19 years old and adolescence is a transitional phase between childhood and adulthood characterized by marked acceleration in growth.[1] Adolescents constitute 18-25% of the population in countries of South East Asia Region, in India, account for one fifth of the total population and are a significant human resource that needs to be given ample opportunity for holistic development towards achieving their full potential.[2] Ten common risk factors such as unhealthy diet, physical inactivity, smoking, alcohol use, tobacco use, overweight, raised blood pressure, raised total cholesterol levels and raised blood sugar are the most prevalent risk factors among the world population.[3]

Adolescent obesity has increased with the change in life

styles, with increased purchasing power and increased physical inactivity and dietary and cultural transition.[4] Hypertension is becoming an important public health problem worldwide. It is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries.[5] Reports indicate that nearly 1 billion adults had hypertension in 2000; this is predicted to increase to 1.56 billion by 2025.[6]

A strong correlation has been reported between changing lifestyle factors (unhealthy diet, physical inactivity, alcohol and tobacco use) and the increase in hypertension. Despite the facts, that the harmful effects of tobacco chewing and smoking are widely known, many young people start smoking during adolescence, largely because they believe that smoking will boost their social acceptability and image.[7]

The prevalence of lifestyle disease risk factors will increase even further unless broad and effective preventive measures are implemented. Thus adolescents are the future generation of any country and their nutritional needs are critical for the well-being of the society. Several factors affect the health status of adolescents. Among these, socio-economic and demographic factors are associated with worldwide patterns of malnutrition. Although various health problems of the adolescents have been addressed, there is paucity of data regarding adolescents particularly in Bareilly district. Therefore this study was conducted to assess the health status of the school going adolescents of Bareilly district.

METHODS

Study area

This cross-sectional study was undertaken amongst adolescents aged 10-19 years studying in classes 9th-12th of senior secondary schools of urban Bareilly. The approval for this study was obtained from the institutional ethical committee. The schools and students were selected by convenience sampling. The students were surveyed through a self-administered questionnaire after taking consent from their principal. The students were assured confidentiality of their responses. Dietary practices, physical activity, tobacco and alcohol use were assessed. Blood pressure and body mass index were measured. All measurements were taken by the authors themselves.

Following operational definitions were put to use in the present study:

Current smoking: Someone who in the preceding month of the survey, smoked in any form either daily or occasionally.

Current smokeless tobacco use*:* Reported consumption of smokeless tobacco in any form in the preceding month of the survey either daily or occasionally.

Alcohol consumption

Reported consumption of alcohol in last 30 days preceding the survey.

Regular physical exercise

Brisk walking and cycling for at least 30 minutes continuously thrice a week.

Moderate intensity sports

Brisk walking, cycling and swimming for at least 30 minutes continuously at least thrice a week.

Vigorous intensity sports or actives

Running or playing football for at least 30 minutes continuously at least thrice a week.

Adverse food intake

It is defined as consumption of adverse foods items at least twice a week.

Extra salt intake

It was assessed by asking about extra salt being added to cooked food items.

Optimal fruit and vegetable intake

Consumption of at least 5 servings of fruits or vegetables at least thrice a week.

Hypertension

It means systolic BP ≥140mmHg and/or mean diastolic BP ≥90mmHg or history of anti hypertensive treatment fifteen days before the survey.

Overweight/obesity

Body mass index level of > 25 $Kg^{/m2}$ and >30 $Kg^{/m2}$ respectively. History of frequency of consumption of adverse foods items such as cheese, butter, fried local foods, red meat, eggs, chicken, fish, aerated soda or sugar, sweetened drinks, pizza, burger, french fries, bakery items, samosa, namkeen etc was also taken (IDSP).[8]

For physical examination, standardized calibrated mercury column type sphygmomanometer; stethoscope, common weighing machine and measuring tape were used.During the course of the interview, two measurements of blood pressure on each study participant with a mercury column sphygmomanometer were made using a standardized technique 30 minutes apart in sitting position.[9] The first blood pressure measurement was recorded after obtaining demographic information from the study subject, while the second recorded after a brief clinical examination.

Blood pressure measurements were made on the left arm of each study subject, using a cuff of appropriate size at the level of the heart. The cuff pressure was inflated 30 mm Hg above the level at which radial pulse disappeared, then deflated slowly at the rate of about 2mm per sec and the readings were recorded to the nearest 2 mm Hg. In case where the two readings differed by over 10 mm of Hg, a third reading was obtained, and the three measurements were averaged. The pressures at which sound appeared and disappeared were taken as systolic blood pressure (SBP) and diastolic blood pressure (DBP) respectively.

Blood pressure was classified as normal (SBP <120 and DBP <80 mmHg), pre-hypertension (SBP = 120-139 and/or DBP = 80-89 mmHg), stage I hypertension (SBP = 140-159 and/or DBP = 90-99 mmHg), and stage II hypertension (SBP > 160 and/or DBP > 100 mmHg).[10]

Body weight was measured (to the nearest 0.5kg) with the subject standing motionless on the weighing scale, feet about 15cm apart and weight equally distributed on each leg. Subjects were instructed to wear minimum outwear (as culturally appropriate) and no footwear while there weight was being measured. Height was measured (to the nearest 0.5cm) with the subject standing in an erect position against a vertical surface, and the head positioned so that the top of the external auditory meatus was level with the inferior margin of the bony orbit (Frankfurt's plain).

Body Mass Index was calculated as weight in kilograms divided by weight in meters squared. Based on their BMI, individuals were classified into four groups: thin (BMI<18.5), normal (BMI=18.5-24.9), overweight (BMI = 25.0-29.9) and obese (BMI >30.0).[11]

Data entry and statistical analysis were performed using the Microsoft Excel and SPSS windows version 14.0 software. Prevalence rates were given as percentages.

RESULTS

Out of a total of 250 participants, majority (62.0%) was males and was Hindus (78.0%) (Table 1). Although the past smoking rate was observed to be 5.2%, only 4.8% were currently smoking. Also 4.8% were currently using smokeless tobacco while 2.4% of adolescents used smokeless tobacco in the past. A total of 3.2% respondents admitted that they had consumed alcohol in last 30 days and 5.2% had consumed alcohol in the past. Only 28.8% were involved in brisk walking and cycling for at least 30 minutes continuously thrice a week. Nearly 22.4% of adolescents were involved in moderate intensity sports while 20.4% in vigorous intensity sports. Only 56% regularly practiced yoga. About 52.4% were non vegetarians. Nearly 70.8% consumed adverse food items such as fried food, cheese, butter, meat, egg, sweetened drinks, pizza, burger, bakery items, pickles and sauces daily. Only 64% consumed fruits for at least three days while 75.6% consumed fruits for at least three days in a typical week. Also 24.4% added extra salt to cooked food items. The overall prevalence of hypertension was 12.0%. About 64.4% were underweight, 28.0% were normal while 7.6% were overweight (Table 2).

Table 1: Distribution of adolescents according to gender and religion.

Characteristics	Total (n=250)
	No. Studied (%)
Gender	
Male	155 (62.0%)
Female	95 (38.0%)
Religion	
Hindus	195 (78.0%)
Muslims	39 (15.6%)
Others	16 (6.4%)

DISCUSSION

The past smoking rate was observed to be 5.2%, while 4.8% of adolescents were currently smoking in our study. Also 4.8% were currently using smokeless tobacco while 2.4% of adolescents used smokeless tobacco in the past. Global Youth Tobacco Survey conducted in Delhi, India shows that one in 10 students (10%) had ever used tobacco in any form.[12] In a study conducted among 1225 school going children in Chennai city, the prevalence of tobacco use was found to be 41.1%.[13] A total of 3.2% respondents in the current study admitted that they had consumed alcohol in last 30 days and 5.2% had consumed alcohol in the past. Similar findings have been reported by a study conducted among school going male adolescents of Aligarh where 3.8% were taking alcohol.[14] Nearly a quarter of adolescents in this study did brisk walking and cycling for at least 30 minutes continuously at least thrice a week. Nearly one fifth of adolescents were involved in moderate intensity sports while another one fifth in vigorous intensity sports. About half of adolescents regularly practiced yoga in our study. Majority (70.8%) consumed adverse food items such as fried food, cheese, butter, meat, egg, sweetened drinks, pizza, burger, bakery items, pickles and sauces daily. Only 64% consumed fruits for at least three days while 75.6% consumed fruits for at least three days in a typical week. Eating habit like junk food, chocolate, eating outside at weekend and physical activity like exercise, sports, sleeping habit in afternoon has shown a remarkable effect on prevalence on overweight and obesity among middle to high socioeconomic group school going adolescents.[15] Lifestyle counseling resulted in significant reduction in inactivity, energy and fat intakes and increase in micronutrient density of diets and physical activity in groups A (diet-exercise counseling with multivitamin-zinc supplementation) and B (diet-exercise counseling) in comparison to group C (placebo).[16]

Table 2: Prevalence of lifestyle disease risk factors among the study population.

Risk factors	Males	Females	Total (n=250)	P- value
			No. (%)	
Current smoking status				
Smokers	9 (3.6%)	3 (1.2%)	12 (4.8%)	>.05
Non-smokers	146 (58.4%)	92 (36.8%)	238 (95.2%)	
Past smoking status				
Smokers	10 (4.0%)	3 (1.2%)	13 (5.2%)	>.05
Non-smokers	145 (58.0%)	92 (36.8%)	237 (94.8%)	
Current smokeless tobacco use				
Present	8 (3.2%)	4 (1.6%)	12 (4.8%)	>.05
Absent	147 (58.8%)	91 (36.4%)	238 (95.2%)	
Past smokeless tobacco use				
Present	4 (1.6%)	2 (0.8%)	6 (2.4%)	>.05
Absent	151 (60.4%)	93 (37.2%)	244 (97.6%)	
Alcohol consumption in last 30 days				
Present	5 (2.0%)	3(1.2%)	8 (3.2%)	>.05
Absent	150 (60.0%)	92 (36.8%)	242 (96.8%)	
Alcohol consumption in the past				
Ever consumers	8 (3.2%)	5 (2.0%)	13 (5.2%)	>.05
Never consumers	147 (58.8%)	90 (36.0%)	237 (94.8%)	
Regular physical exercise				
Present	45 (18.0%)	27 (10.8%)	72 (28.8%)	>.05
Absent	110 (44.0%)	68 (27.2%)	178 (71.2%)	
Moderate intensity sports				
Yes	35 (14.0%)	21 (8.4%)	56 (22.4%)	>.05
No	120 (48.0%)	74 (29.6%)	194 (77.6%)	
Vigorous intensity sports				
Yes	38 (15.2%)	13 (5.2%)	51 (20.4%)	<.05
No	117 (46.8%)	82 (32.8%)	199 (79.6%)	
Yoga				
Yes	8 (3.2%)	6 (2.4%)	14 (5.6%)	>.05
No	147 (58.8%)	89 (35.6%)	236 (94.4%)	
Diet				
Vegetarian	66 (26.4%)	53 (21.2%)	119 (47.6%)	<.05
Non Vegetarian	89 (35.6%)	42 (16.8%)	131 (52.4%)	
Extra salt added				
Yes	41 (16.4%)	20 (8.0%)	61 (24.4%)	>.05
No	114 (45.6%)	75 (30.0%)	189 (75.6%)	
Adverse food intake				
Present	113 (45.2%)	64 (25.6%)	177 (70.8%)	<0.5
Absent	42 (16.8%)	31 (12.4%)	73 (29.2%)	
Optimal fruit Intake				
Present	85(34.0%)	75 (30.0%)	160 (64.0%)	<.001
Absent	70(28.0%)	20 (8.0%)	90 (36.0%)	
Optimal vegetable intake				
Present	112(44.8%)	77 (30.8%)	189 (75.6%)	>.05
Absent	43 (17.2%)	18 (7.2%)	61 (24.4%)	
Body mass index				
<18.5	90(36.0%)	71 (28.4%)	161 (64.4%)	
18.5-24.9	52 (20.8%)	18 (7.2%)	70 (28.0%)	>0.5
25-30	7 (2.8%)	3 (1.2%)	10 (4.0%)	
>30	6 (2.4%)	3 (1.2%)	9 (3.6%)	
Hypertension				
Present	17 (6.8%)	13 (5.2%)	30 (12.0%)	>0.5
Absent	138 (55.2%)	82(32.8%)	220 (88.0%)	

The overall prevalence of hypertension was 12.0% in the present study. In a cross-sectional population-based study of 1022 students aged 14-19 years in New Delhi, hypertension was seen in 6.4% of adolescents.[17] The prevalence of hypertension in a study conducted among school children of Surat was also found to be 6.48%.[18] About 64.4% were underweight, while 7.6% were overweight in our study. I*ncidence of obesity was 3.4% and overweight was 12.7% among affluent school going adolescents of Ludhiana.*[19] As per new guidelines by the Government of India 56.4 % was found to be undernourished while 5.8 % was found to be Overweight (BMI >23.5 kg/m^2) among early adolescent girls in Andhra Pradesh.[20] Nearly 41.3% of adolescents were found underweight in a study conducted in Ahmedabad.[21]

We can have projections from the study that lifestyle modifications such as restriction of tobacco and alcohol use, high intake of fruits and vegetables and increased physically activity may lead to decrease in blood pressure and weight of an individual. This study also emphasizes the need for large, nationwide, multicentric, prospective, and supervised epidemiological studies as presently there is an increase in cases of hypertension, obesity and other lifestyle diseases among urban adolescents in our country. This can largely be attributed to the transformation in the lifestyles of young adolescents from being physically active and consuming more of home cooked food to being physically inactive (spending more time at home playing indoor games, watching television and using the internet) and eating adverse food items such as fried food, cheese, butter, meat, egg, sweetened drinks, pizza, burger, bakery items, pickles and sauces.

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