Assessment of Prevalence of Risk Factors of Non-Communicable Disease in School Going Adolescents

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Abstract: The rising burden of preventable risk factors for non-communicable diseases (NCDs) among adolescents is a major public health challenge worldwide. The data on these risk factors in school age population is deficient in India. The present study was conducted to evaluate the prevalence of lifestyle associated risk factors for non-communicable diseases in apparently healthy school children. To assess the prevalence of risk factors of non-communicable disease in school going adolescents.

Keywords: Adolescents, Non-communicable diseases, Preventable lifestyle risk factors.

INTRODUCTION

Non-communicable diseases (NCDs) and their associated risk factors have emerged rapidly and are becoming a major public health challenge worldwide. The impact of NCDs is devastating in terms of premature morbidity, mortality, and economic loss [1,2]. There is an extensive literature demonstrating that NCDs are more likely to occur with unhealthy diet, physical inactivity, active and passive smoking, whereas prevention of these factors has positive effects on reducing NCDs rates and all-cause mortality [5,6]. It has been reported that up to 80% of deaths due to heart disease, stroke, and type 2 diabetes and 40% of deaths due to cancers could be prevented by eliminating known lifestyle risk factors [1]. With some exceptions, most previously reported work from various countries has either investigated the combination of biological and clinical risk factors for NCDs in the general population [7,8] or has studied specific groups of adults and elderly populations [10,11], thus missing adolescents, who represent more than one fifth of the world's population (more than 1.2 billion) [12].

The World Health Organization has already warned of increasing NCDs among adolescents as a major public health problem [13]. The importance of this age group also lies in the fact that many serious diseases in adulthood have their roots in adolescence [12,14]. For these reasons, we sought to assess the proportion of preventable lifestyle risk factors for NCDs. Parents are always supposed to be the first teachers and trainers of their child. Children and adolescents usually spend a large proportion of their time with their parents, whose affection, liking, and care contribute vitally towards the health habits of their children. However, data are very scarce about parental factors associated with children's practicing healthy habits. In this study we also identified parental factors that are associated with co-existence of risk factors among study participants. This work will provide a basis for further research and interventions in adolescents for the prevention of NCDs

METHODS

Cross-sectional study carried out among 1997 students of class 5 to class 10 (aged 10 to 16 years) in 16 schools in urban field practice area of Dr. B R Ambedkar Medical College and Hospital. Students were interviewed personally using a predesigned structured questionnaire modified from WHO-STEPS instrument for NCD risk factors and GSHS (Global School Based Student Health Survey) questionnaire.

OBSERVATIONS AND RESULTS

Mean	Male	Female	Total
Mean age in years	13.07(+1.74)	12.99(+1.68)	13.03 (+1.70)
Mean number of days fruit consumed in a typical week	4.36(+2.11)	4.01(+2.10)	4.18(+2.11)
Mean number of servings of fruit consumed on average per day	1.55(+1.20)	1.43(+0.88)	1.49(+1.04)
Mean number of days vegetables consumed in a typical week	4.99(+2.09)	4.87(+2.10)	4.93(+2.10)
Mean number of servings of vegetables consumed on average per day	1.85(+1.24)	1.64(+1.01)	1.74(+1.13)
Percentage who ate less than 5 servings of vegetables on average per day	908(94.7)	1015(97.69)	1923(96.29)
Percentage who ate less than 5 servings of fruit on average per day	936(97.7)	1024(98.55)	1960(98.14)

Mean/ Percentage	Male	Female	Total
Percentage who always or often add salt to their food before eating or as they are eating	532(55.53)	632(60.82)	1164(58.28)
Percentage with insufficient physical activity (defined as < 150 minutes of moderate-intensity activity per week, or equivalent)*	198(20.7)	497(47.8)	695(34.8)
Median time spent in physical activity on average per day (minutes) (presented with inter-quartile range)	90(60-120)	30(0-90)	60(20-120)
Median sedentary time spent per day (min)	240 (132.5-540)	450(180-540)	320(180-540)

Mean / Percentage	Male	Female	Total
Mean body mass index - BMI (kg/m2)	17.93(5.18)	18.78(3.62)	18.37(4.46)
Percentage who are overweight (BMI >23 kg/m2)	47(4.9)	48(4.61)	95(4.75)
Percentage who are obese (BMI 25-30 kg/m2)	15(1.56)	52(5.00)	67(3.35)
Percentage who are obese (BMI >30kg/m2)	6(0.62)	16(1.53)	22(1.10)
Average waist circumference (cm)	62.117(9.73)	61.684(8.56)	61.89(9.14)
Mean systolic blood pressure - SBP (mmHg)	96.81(10.49)	97.16(29.79)	96.99(22.68)
Mean systolic blood pressure - DBP (mmHg)	63.08(9.93)	62.18(8.9)	62.61(9.41)
Percentage with raised SBP	4(50)	4(50)	8(0.7)
Percentage with raised DBP	6(85.7)	1(14.3)	7(0.6)

The present study on assessment of risk factors for non communicable diseases was conducted on 1997 school going adolescents in the age group of 10-16 years. The mean age of the study population was 13.03(+ 1.70). 41.21% were in the age group of 10-12 and 58.78% of the subjects were aged 13-16 years. Table 1 represents the distribution of study population based on age group and gender.

Majority of the population were muslims (56.3%). 78.10% of the students belonged to nuclear family and majority (78.1%) of them lived in a family of >4 members.

Most of them (89.93%) followed a mixed diet. Most of them (88.43%) consumed <4 meals/week that were not prepared at home. Only <15% of students consumed >5 mid day meals per week. [This could be due to the fact that only one government school was included in the study and the private schools did not provide mid day meals.

In the age group of 10-12 years, 30.01% consume fruits 3-4 days a week and 27.58% consume fruits daily. In the 13-16 years age group, 31.43% consume fruits 3-4 days per week and only 20.61% of them consume fruits daily.

99.63% in the 10-12 age group and 97.1% in the 13-16 age group consumes <5 servings of fruit daily. Table 3 shows the distribution based on consumption of fruit servings.

39.12% in 10-12 age group and 37.56% in 13-16 years age group eat vegetables daily but only 2

students in the younger age group and 32 students in older age group eat >5 servings of vegetables per day.

A total of 58.98% of the study population consumed artificial drinks on >3 days per week. 82.57% of them consumed junk food on >3 days per week. Only 37.7% of them consumed milk or milk products daily. 40.51% of study population consumed meat for 3-6 days per week.

76.76% of them walk or use bicycle to get to and from places. 67.95% of population walk/ use bicycle for >3 days a week. In the 10-12 age group 43.2% and in 13-16 age group, 76% of them spend >30 minutes per day for walking and cycling. The trends for both age groups are the same.

79.26% of the students engage in moderate intensity sports. In the younger age group, 71.2% engage in sports for >5 days a week, whereas in the older age group, only 41.7% play >5 days/week and 39.6% play for <3 days a week. 61.44% engage in sports for >60 minutes per day.

2 people in 10-12 age group and 13 people in 13-16 age group said they consume tobacco/betel nut. 3 people in 10-12 age group and 4 people in 13-16 age group said they consume alcohol.

Majority of the students did not have family h/o smoking of tobacco. Among the total number of students examined 23.39% of students gave a positive history of smoking among family and friends. Figure 13 shows the statistics for family h/o consumption of smokeless tobacco and majority of them had a positive history.

Only 6.81% gave history of consumption of alcohol among family members.

The mental and emotional stress (subjective) of the students was assessed. 19.87% of the population said they never had difficulty concentrating on homework. 35.7% of the total population said they rarely found it hard to focus on homework during the last 12 months. 42.2% in the age group of 13-16 years said they found it hard to focus most of the times.8.96% of them said they always found it hard to focus on homework.

35.8% of the students said that in the past 12 months, they were never worried about something so much that they were not hungry or skipped meals. 43.11% said there were rarely worried, 18.47% were worried most of the time and 2.6% said they were always worried.

57.63% of the study population said that their parents pressurized them to study. 76.16% said they

sometimes discussed personal problems with parents. The trends were same in both age groups.

In the 10-12 years age group, 60.1% said their parents beat them sometimes whereas in the 13-16 years group, only 43.6% were beaten by parents.

38.6% of the students said their parents fought sometimes and most of them said their parents never fought.

Among children with family history of hypertension and diabetes mellitus i.e., among their parents and grandparents, 40.61% gave history of hypertension and 36.91% gave history of diabetes.

37% of children among those surveyed gave family history of obesity among their parents.

Maximum students i.e., 58.64% in our study population were found to be underweight that is, they had a BMI of <18.5kg/m2. 32.15% fell in the normal range of 18.5-22.9kg/m2. 9.21% of children were found to have a BMI above the normal range.4.7% were overweight, 3.35% were obese and 1.1% had BMI of more than 30 kg/m2.

Among the total number of boys examined, 1.15% had WC of >90cm and 4.53% of the girls had WC >80cm. [98.85% had a waist circumference of <90cm while 95.47% of the girls had a waist circumference of <80cm.]

On calculation, it was found that 92.79% of the boys showed a waist-hip ratio of <0.90 and 79.49% of girls showed a ratio of <0.80.

On measuring blood pressure for the 13-16 years age group, it was found that a majority of students i.e., 97.8% and 94% of total students fell in the normal range of systolic and diastolic blood pressures respectively.

On measuring skin fold thickness over triceps, it was found those 12 (2.88%) males and 33(8.10%) of females in the age group 10-12 years had skin fold thickness above the normal. In the 13-16 age group only 1(0.18%) male and 9(1.43%) females have skin fold thickness more than normal.

DISCUSSION
This study of adolescents indicated an alarming level of these risk factors, which are preventable to a major extent and have very important public health consequences. Many studies have been done on the prevalence of obesity in adolescent, however only few studies have been done on assessment of risk factors for NCD in adolescent. Nevertheless, this study indicated that almost all participants had at least one preventable lifestyle risk

factor for NCDs, and co-existence of risk factors was very common. This work could help to guide comprehensive, multifaceted, and integrated interventional programs, which should focus on various health promoting issues, such as improved access to healthy foods, prohibition of smoking at work and in public places, and restrictions on the sale of cigarettes and other tobacco products to adolescents and school-age children. The availability of and access to safe playing courts and grounds should be assured. Along with discontinuing advertisements and the promotion of unhealthy behaviors and practices in the media, there should be school-based educational strategies to increase knowledge and awareness about the risk factors of NCDs and their prevention. Being important stakeholders in promoting healthy lifestyles in their children, parents should be advised and counseled about good parenting. These preventive steps will provide cost-effective results in comparison with the very costly treatment and management of NCDs later. This study also provides grounds for conducting further research on a larger scale to identify the magnitude of preventable and modifiable risk factors in the development of NCDs and to develop and test educational and preventative interventions

CONCLUSIONS
Most of the adolescents studied had preventable risk factors for NCDs. These results warrant comprehensive and integrated interventions to prevent lifestyle risk factors, and parents are front-line stakeholders.

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