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A Study on Behavioral Risk Factors of Non-Communicable Diseases among Rural School Going Adolescents in a Block of Hooghly District, West Bengal

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ABSTRACT

Introduction: Cost effective interventions (educational and behavioural interventions) for the reduction of non-communicable diseases risk factors should be promoted especially in the low and middle income countries such as India.
Method: A pre-designed and pre-tested questionnaire was used in class-room setting to collect information from students regarding their socio- demographic characteristics and presence of behavioral risk factors of non-communicable diseases.
Results: A total of 761 students of class VI-XII participated in the study of which 61.4% were boys and rests were girls. Most common risk factor was 'intake of extra salt with food' (54.7%), followed by fast food intake >3 times/week (33.8%). Statistical analysis by chi square test revealed that extra salt intake, tobacco use and alcohol use was significantly associated with age. Similarly, sex of the students was significantly associated with tobacco use, alcohol use and physical activity ($p < 0.05$). Father's education was significantly associated with extra salt intake in food. Mother's education was significantly associated with unsatisfactory intake of fruits and vegetables (< 5 times/week), extra salt intakes in food and tobacco use ($p < 0.05$). Father's occupation was significantly associated with fast food intakes and physical activity whereas mother's occupation had significant association with tobacco use ($p < 0.05$).
Conclusion: Healthy children are the foundation for a healthy nation. The universal belief is that schools are designated as an important setting in which children should develop behaviour and skills for physical, emotional and social well-being.

Key Words: Adolescents, Behavioral Risk factor, Socio-Demographic characteristics, Rural school.

INTRODUCTION

Diseases which are not infectious are called non-communicable disease. The main preventable risk factors for non-communicable diseases are tobacco consumption; poor dietary habits, sedentary life style etc. Cost effective interventions (educational and behavioural interventions) for the reduction of non-communicable diseases risk factors should be promoted especially in the low and middle income countries such as India. Collection of data on key risk factors of major non-communicable diseases at regular intervals in order to design community-based interventions targeted at the reduction of these risk factors and monitoring the results of such interventions.

Further, schools offer an ideal setting of a captive population of adolescents for these interventions. In fact,

the need for early intervention to promote health in children is recognized because children exhibit risk factors for non-communicable diseases that often persist into adulthood. School children were selected as the study group because they are at a receptive age and are influential in determining the health of the next generation. Behavioral interventions for non-communicable diseases abeyance would profit the most, if initiated in this age group. Hence students' awareness about non-communicable diseases and their risk factors in an important part of population-based prevention strategy.

This rural block was chosen due to its proximity to the megacity of Kolkata which influences the lifestyle pattern and other behavioral characteristics of the people residing in the area. The co-education higher-secondary school has over thousands of students of different demographic backgrounds. This is the best way to study adolescents for behavioral risk factor of non-communicable diseases.

MATERIAL AND METHODS

Among the rural block of Hooghly district Tarakeswar was chosen due to its proximity to the megacity of Kolkata which influences the lifestyle pattern and other behavioural characteristics of the people residing in the area. Among five higher secondary co-education schools under Tarakeswar block, Ramnagar Noot Behari Pal Chowdhury High School has been selected for the study. The school caters highest number of students among the five. The present school- based cross sectional study was conducted among students of class VI-XII of academic year 2014-15 (May 2014 to April 2015). A total of 761 students in the age group of 10-18 years were participated in the study of which 61.4% were boys and rests were girls.

Ethical consideration was taken from the Institutional Ethics Committee of All India Institute of Hygiene and Public Health prior to the study. After taking permission from school authority and consent from each participant; they were explained the purpose of the study. All willing students present in the class/section on the day were subjected to data collection. Any participant having any physical disabilities and congenital anomalies were excluded from the study.

The questionnaire was designed as a booklet in Bengali language with instructions based on WHO STEPS methodology [1] and WHO Global School-based Student Survey [2] with some modification to use in class-room setting to collect information from students regarding the presence of risk factors of non-communicable diseases. Face validity of each item and content validity of each domain was ascertained by a group of experts in AIIIH and PH, Kolkata. Prior to the study, the questionnaire was pretested on students of a different school of the same block.

Age was recorded in year. Age was verified from school record book. Data were entered into a spread sheet and exported to Statistical Package for the Social Science® (SPSS) for Windows, version 16.0 software for analysis.

RESULTS

Table 1: Sex-wise distribution of students according to age group (n=761)

Age group (Years)	Boys No (%)	Girls No (%)	Total No (%)
10-12	142(30.4)	94(32)	236(31)
13-15	215(46)	123(41.8)	338(44.4)
16-18	110(23.6)	77(26.2)	187(24.6)
Total	**467(100)**	**294(100)**	**761(100)**

Students in the age group of 10-12 years, 13-15years and 16-18 years were 31%, 44.4% and 24.6% respectively.

Table 2: Distribution of Behavioral risk factors for non-communicable diseases according to sex

Risk factors	**Boys (n=467) No (%)**	**Girls (n=294) No (%)**	**Total (n=761) No (%)**
Fruits and vegetables < 5 times/week	92(19.7)	49(16.7)	141(18.5)
Fast food >3 times/week	164(35.1)	93(31.6)	257(33.8)
Extra salt intake in food	257(55)	159(54.1)	416(54.7)
Tobacco use in the past 30 days	106(22.7)	3(1)	109(14.3)
Alcohol consumption in the past 30 days	46(9.9)	2(0.7)	48(6.3)
Less physical activity	101(21.6)	161(54.8)	262(34.4)

Most common risk factor was 'intake of extra salt with food' (54.7%), followed by fast food intake >3 times/week (33.8%).

Table 3: Association between behavioral risk factors with age group and sex of participants (n=761)

Behavioral risk factors	**Age group (year)**				**Sex**		
	10-12 No (%)	13-15 No (%)	16-18 No (%)	p ##	Boys No (%)	Girls No (%)	p #
Fruits and vegetables (<5 times/week)							
Yes	44(18.6)	54(16)	43(23)	0.14	92(19.7)	49(16.7)	0.294
No	192(81.4)	284(84)	144(77)		375(80.3)	245(83.3)	
Fast food (>3 times/week)							
Yes	70(29.7)	120(35.5)	67(35.8)	0.274	164(35.1)	93(31.6)	0.322
No	166(90.3)	218(64.5)	120(64.2)		303(64.9)	201(68.4)	
Extra salt intake in food							
Yes	136(57.6)	201(59.5)	79(42.2)	0.000***	257(55)	159(54.1)	0.798
No	100(42.4)	137(40.5)	108(57.5)		210(45)	135(45.9)	
Tobacco use							
Users	18(7.6)	56(16.6)	35(18.7)	0.002**	106(22.7)	3(1)	0.000***
Non-users	218(92.8)	282(83.4)	152(81.3)		361(77.3)	291(99)	
Alcohol use							
Users	1(0.4)	19(5.6)	28(15)	0.000***	46(9.9)	2(0.7)	0.000***
Non-users	235(99.6)	319(94.4)	159(85)		421(90.1)	292(99.3)	
Physical activity							
Less	85(36)	122(36.1)	55(29.4)	0.251	101(21.6)	161(54.8)	0.000***
Active	151(64)	216(63.9)	132(70.6)		366(78.4)	133(45.2)	

##Degree of freedom =Two; #Degree of freedom =One
**P < 0.05; **P < 0.01; ***P < 0.001.*

Statistical analysis by chi square test revealed that extra salt intake, tobacco use and alcohol use was significantly associated with age. Similarly, sex of the students was significantly associated with tobacco use, alcohol use and physical activity (p <0.05).

Table 4: Association between behavioral risk factors and educational status of the parents of school children (n=761)

Behavioral risk factors	**Educational status**					
	Father			**Mother**		
	≥Secondary No (%)	**<Secondary No (%)**	**p #**	**≥Secondary No (%)**	**<Secondary No (%)**	**p #**
Fruits and vegetables (<5 times/week)						
Yes	55(17.9)	86(18.9)	0.720	40(13.4)	101(21.8)	0.004**
No	252(82.1)	368(81.1)		258(86.6)	362(78.2)	
Fast food (>3 times/week)						
Yes	115(37.5)	142(31.3)	0.077	106(35.6)	151(32.6)	0.400
No	192(62.5)	312(68.7)		192(64.4)	312(67.4)	
Extra salt intake in food						
Yes	145(47.2)	271(59.7)	0.001**	141(47.3)	275(59.4)	0.001**
No	162(52.8)	183(40.3)		157(52.7)	188(40.6)	
Tobacco use						
Users	35(11.4)	74(16.3)	0.058	29(9.7)	80(17.3)	0.004**
Non-users	272(88.6)	380(83.7)		269(90.3)	383(82.7)	
Alcohol use						
Users	21(6.8)	27(5.9)	0.619	21(7)	27(5.8)	0.501
Non-users	286(93.8)	427(94.1)		277(93)	436(94.2)	
Physical activity						
Less	117(38.1)	145(31.9)	0.079	109(36.6)	153(33)	0.317
Active	190(61.9)	309(68.1)		189(63.4)	310(67)	

#Degree of freedom =One **P < 0.05; **P < 0.01; ***P < 0.001.*

Statistical analysis by chi square test revealed that Father's education was significantly associated with extra salt intake in food. Mother's education was significantly associated with unsatisfactory intake of fruits and vegetables (< 5

times/week), extra salt intakes in food and tobacco use (p <0.05).

Table 5: Association between behavioral risk factors and occupational status of the parents of school children (n=761)

Behavioral risk factors	Occupational status					
	Father			Mother		
	Farmer and manual labour No (%)	Other No (%)	p #	House wife No (%)	Other No (%)	p #
Fruits and vegetables (<5 times/week)						
Yes	92(20.7)	49(15.5)	0.065	129(19.1)	12(14.3)	0.304
No	352(79.3)	268(84.5)		548(80.9)	72(85.7)	
Fast food (>3 times/week)						
Yes	135(30.4)	122(38.5)	0.020*	221(32.6)	36(42.9)	0.062
No	309(69.6)	195(61.5)		456(67.4)	48(57.1)	
Extra salt intake in food						
Yes	256(57.7)	160(50.5)	0.05	377(55.7)	39(46.4)	0.108
No	188(42.3)	157(49.5)		300(44.3)	45(53.6)	
Tobacco use						
Users	69(15.5)	40(12.6)	0.257	104(15.4)	5(6)	0.020*
Non-users	375(84.5)	277(87.4)		573(84.6)	79(94)	
alcohol use						
Users	24(5.4)	24(7.6)	0.226	46(6.8)	2(2.4)	0.117
Non users	420(94.6)	293(92.4)		631(93.2)	82(97.6)	
Physical activity						
Less	137(30.9)	125(39.4)	0.014*	231(34.1)	31(36.9)	0.613
Active	307(69.1)	192(60.6)		446(65.9)	53(63.1)	

#Degree of freedom =One **P < 0.05; **P < 0.01; ***P < 0.001.*

Statistical analysis by chi square test revealed that Father's occupation was significantly associated with fast food intakes and physical activity whereas mother's occupation had significant association with tobacco use (p <0.05).

DISCUSSION

The present school-based study on risk factors of non-communicable diseases among students has documented a high risk factor profile among adolescence.

Table 2 found Most common risk factor was 'intake of extra salt with food' (54.7%), followed by fast food intake >3 times/week (33.8%).

Increases in the number of extra salt intake among students in both sexes may be due to change in the dietary behaviour of the students. Salt is an independent risk factor for hypertension and has dose-response relationship with hypertension [3]. However; this relationship depends upon the genetic make-up of the subjects.

Fruits and Vegetables are classed as protective foods. They are good sources of vitamins and minerals. Change of dietary pattern may be the result of economic and nutritional transition. This probably reflects emerging trends in fast food eating practices in rural adolescents.

Table 3 found statistical analysis by chi square test revealed that extra salt intake, tobacco use and alcohol use was significantly associated with age. Similarly, sex of the students was significantly associated with tobacco use, alcohol use and physical activity. (p <0.05).

Tsering D, et al.[4] (2010) Substance use was associated more with male students,

Jain A et al. [5] (2012) chi square test determine the significant (p <0.05) association between physical activity and sex, R. Sogarwal et al. [6] (2014) significant association was found between the uses of tobacco/alcohol with age and use of tobacco among girl students was significantly lower compared to their counterparts, Shradha S P et al .[7] (2015) gender (p<0.001) was significantly associated with current smoking, current consumption of alcohol and the number of females involved in physical activity was found to be significantly less. Bathma V et al. [8] (2015) the use of tobacco was significantly higher amongst boys as compared to girls, Khuwaja AK et al. [9] (2011) physically inactivity was true of more girls than boys (p <0.001).

The study participants were in their adolescence age. This is a stage of formation of habits, behaviors and attitude

that remain through the life. Tobacco use, particularly at younger ages, increases the duration of tobacco exposure, leading to a higher risk of developing non-communicable diseases at comparatively early ages, during what are usually thought to be the most productive years of life.

Reason for the high percentage of physically inactive girls may be that in our society, for cultural reasons, girls are generally not permitted to go outside the home and participate in sports or physical activity programs.

Table 4 found father's education was significantly associated with extra salt intakes in food. Mother's education was significantly associated with unsatisfactory intake of fruits and vegetables (< 5 times/week), extra salt intakes in food and tobacco use. ($p < 0.05$).

Khuwaja AK et al. [9] (2011) found the pattern of the co-existence of these risk factors was also higher among adolescents whose fathers worked at blue-collar jobs.

Table 5 found father's occupation was significantly associated with fast food intakes and physical activity whereas mother's occupation had significant association with tobacco use. ($p < 0.05$).

Parental occupation and education predict healthy habits in adulthood. [10] This may reflect a gap in the perception of care between child and parent. There are some likely explanations for this attitude in the relationship; probably the most important is a lack of quality time spent together and a lack of attention given by parents to their child.

Due to a lack of political commitment and poor awareness about the health hazards of passive effect, smoking is still done in prohibited areas like public places, public transport, or shopping areas.

The cross-sectional study was conducted in a single school of Tarakeswar Block of Hooghly District. Results are not representative of the district or the block.

Quality of collected information through questionnaire on dietary behaviour of participants such as frequency of intake of fruits and vegetables, fast food intake, intake of extra salt intake with food etc. had some inherent limitation due to recall bias which is very much dependent on age of the participant, gender, intelligence, mood, attention, and consistency of eating pattern etc.

As information regarding health related practices were self-reported by the participants there is a possibility that sensitive and socially undesirable responses like smoking habit, alcohol intake etc., might have been underreported though the assurance made by the researcher regarding maintenance of anonymity and confidentiality of the data.

CONCLUSION

The present school-based study on behavioural risk factors of non-communicable diseases among students has documented a high risk factor profile for non-communicable diseases among students. The study findings strongly argue in favour of early life interventions to promote healthy life style among children and adolescents. School-based life style education interventions have the potential of reducing emergence of non-communicable diseases risk factors, like tobacco use, excess intake of salts, lack of fruits and vegetables in diet and sedentary life style. In this context, sensitization and training of school teachers on magnitude of non-communicable diseases, their risk factors and preventive interventions can be initiated as a pilot basis.

Observance of different health days/week in relation to NCDs in school (Anti-Tobacco day -31st May, World Cancer Day - 4th February, World Health Day - 7th April, National Nutrition Week -- 1st week of September) may facilitate awareness generation on life style issues among students, teachers and parents. Prevention and control efforts outside the health sector, like banning of sale of tobacco and alcohol to children and adolescents need to be implemented strictly.

Much of a nation's future depends upon the status of its children. Healthy children are the foundation for a healthy nation. The universal belief is that schools are designated as an important setting in which children should develop behaviour and skills for physical, emotional and social well-being.

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