

Awareness Of Non-Communicable Diseases And Their Risk Factors Among School Going Adolescents Of Jamnagar City

¹Nasrin A Hala, ²Ilesh S Kotecha, ³Sumit V Unadkat, ⁴Ranchhod N Nakum, ⁵Khyati A Nimavat, ⁶Dipesh V Parmar

¹Tutor, Department of Community Medicine, GMERS Medical College, Junagadh, Gujarat, India

²Assistant Professor, Department of Community Medicine, Shree M. P. Shah Government Medical College, Jamnagar, Gujarat, India

³Associate Professor, Department of Community Medicine, Shree M. P. Shah Government Medical College, Jamnagar, Gujarat, India

⁴Assistant Professor, Department of Community Medicine, GMERS Medical College, Morbi, Gujarat, India

⁵Assistant Professor, Department of Community Medicine, GMERS Medical College, Junagadh, Gujarat, India

⁶Professor and Head, Department of Community Medicine, Shree M. P. Shah Government Medical College, Jamnagar, Gujarat, India

Corresponding Author:

Ranchhod Nareshbhai Nakum

Assistant Professor, Department of Community Medicine, GMERS Medical College, Morbi, Gujarat, India

Email: drnasrinahala@gmail.com

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ABSTRACT

Background: Many of the factors that contribute to health risks among adolescents are preventable if identified and changed as early as possible. Early intervention can alter patterns of behaviors that would have placed young people at risk in later life. Preventing risky behavior and promoting healthy choices among adolescents can yield positive health outcomes not just during adolescence but also during adulthood.

Objectives: To assess the awareness of Non-communicable diseases and their risk factors among school going adolescents of Jamnagar city.

Methodology: A school based cross sectional study was conducted among 960 school going adolescents from the private and government schools of Jamnagar city. Socio-demographic data was collected and awareness of risk factors of non-communicable diseases was assessed with the help of a pre-designed, pre-tested, self-administered questionnaire.

Results: In the study 59.6% adolescents were boys and 53.3% were studying in private schools. More than 80% knew the types, symptoms and presentation of Cancer and Diabetes while 75.5% and 74.3% respectively knew about heart disease and hypertension. For heart diseases main risk factors reported were fatty diet (35.7%), lack of physical activity and excessive anxiety (31.4%), fast food consumption (30.9%) and alcohol consumption (29.9%). For diabetes fatty diet (34.8%), soft drinks (32.2%) and fast food (27.4%) were the main risk factors. Tobacco chewing (87.4%), alcohol consumption (73.3%) and smoking (73.0%) were the risk factors for various type of cancer. Excessive salt intake (57.2%), excessive anxiety and stress (53.7%) and lack of physical activity (29.8%) were the risk factors for hypertension. Only 20.1% had reasonable knowledge about types, symptoms and nature of non-communicable diseases.

Conclusion: Private school students had better knowledge of NCDs and their risk factors. Girl students had better understanding of risk factors like alcohol, tobacco and faulty dietary habits. The study recommends promotion of supportive environment for strengthening student-based approaches and strategic delivery of health education to increase awareness about risk factors among adolescents.

Keywords: Non-communicable diseases, risk factors, school going adolescents

INTRODUCTION

World changes every second of every day which brings about the changes in lifestyle. Modern lifestyle has drastically changed the way we live and the way it has affected our health and fitness. Chronic non-communicable diseases (NCD) are a major contributor to the burden of disease in developed countries, and are increasing rapidly in developing countries⁽¹⁾. Mortality, morbidity and disability due to major non-communicable diseases account for about 60% of all deaths and 47% of the global burden of disease⁽²⁾. India is a diverse country, and many states in India are passing through an epidemiological health transition with high rates of urbanization. Urbanization has led to economic improvement, the consequences of which are increased food consumption, tobacco-use, and decreased physical activity. One of the effects of this economic transition is a shift in the disease spectrum from communicable to non-communicable diseases (NCDs)⁽³⁾. Adolescence is a critical period of mental, social and emotional wellbeing and development. During adolescence brain undergo significant developmental changes, establishing neural pathways and behavioral patterns that will last in to adulthood⁽⁴⁾. Adolescence is the life stage when the individuals begin to formulate their health habits, setting patterns that continue in to adulthood. Habits and behaviors picked up during adolescence have lifelong impact⁽⁵⁾. The increasing prevalence of NCDs among adolescents is a significant public health problem^{(6) (7)}. Many risk factors for NCDs among adults are associated with behaviors, such as poor dietary habits and physical inactivity, learned during childhood and adolescence⁽⁸⁾. Many of the factors that contribute to health risks among adolescents are preventable if identified and changed as early as possible. Early intervention can alter patterns of behaviors that would have placed young people at risk in later life⁽⁹⁾. Preventing risky behavior and promoting healthy choices among adolescents can yield positive health outcomes not just during adolescence but also during adulthood⁽⁹⁾. Through the present study an attempt has been made to explore the awareness of risk factors of non-communicable diseases in school going adolescents in the study city.

MATERIALS AND METHODS

The present study was a school based cross sectional study conducted in the urban area of Jamnagar city of Gujarat, India. All the government and private schools of study city made our sampling universe. There were total 101 schools and 26942 students in 9th to 12th standard in municipal corporation area. Two stage sampling technique was adopted for this study.

An anticipated p value was taken as 50% as per WHO practical manual on sample size determination in health studies by Lwanga and Lemeshow⁽¹⁰⁾. Using the formula

$$N = 4pq/l^2$$

Where, N= required sample size. p= proportion or prevalence of interest, q=100-p and l=allowable error (10%), the sample size was calculated to be 400

In a study of population-based cluster survey to determine the design effect, Katz (AJCN, 1995) found the design effect range from 0.44 to 2.59 for nutritional related study. Therefore, it is conservative to take Design effect of 2. Considering the design effect, sample size was calculated to be 800. A 20% safety margin was added to allow for a maximum estimated non-response, giving a sample size of about 960. In first stage we selected 30 schools and in second stage by Systematic Random Sampling 32 students (8 students each from standard 9th, 10th, 11th and 12th) were selected from each of the 30 schools. Thus total 960 school going adolescent students were recruited from schools of study city.

A structured pre-coded proforma with the help of WHO Steps Approach and CDC's Global school-based student health survey (GSHS) was prepared in Gujarati and English language

for the survey. The proforma was pre-tested in the two schools on 30 children. Data was collected by self-administering the questionnaire by students after explaining them the items of proforma. An oral consent was taken from all participants of the study after fully explaining the purpose of the study and assuring them of full confidentiality.

Data entry was done using statistical software Epi Info version 3.5.2 and analyzed for various parameters and cross tabulation was done using the same software. Categorical data were presented with frequency and percentage and Chi square test was applied to look for any association between various parameters with p value < 0.05 considered as statistically significant.

The study protocol was reviewed and approved by The Institutional Ethical Committee.

RESULTS

Table 1: Distribution as per the gender, age and type of school

Variable		Male No. (%)	Female No. (%)	Total No. (%)
Age group (in years)	13 – 15	259 (45.3%)	165 (42.5%)	424 (44.2%)
	15 - 17	241 (42.1%)	195 (50.3%)	436 (45.4%)
	17 - 19	72 (12.6%)	28 (07.2%)	100 (10.4%)
Type of school	Government	279 (48.8%)	169 (43.6%)	448 (46.7%)
	Private	293 (51.2%)	219 (56.4%)	512 (53.3%)
Total		572 (59.6%)	388 (40.4%)	960 (100.0%)

Gender wise distribution of the studied adolescents showed that almost sixty percent were boys (59.6%) and more than half of the participants were studying in private school (53.3%). Almost similar proportion of the adolescents belonged to 13-15 and 15-17 years of age group while very few students were in 17-19 years of age group (10.4%). [Table-1]

Table 2: Knowledge of Non-communicable disease

Heard about	Knows types, symptoms, presentation	Knowledge about person distribution	Knowledge about preventive measures	Myth that NCDs are Communicable
Heart Disease	725 (75.5%)	497 (51.8%)	494 (56.4%)	101 (10.5%)
Cancer	790 (82.3%)	571 (59.5%)	541 (56.4%)	141 (14.7%)
Diabetes	795 (82.8%)	550 (57.3%)	551 (57.4%)	107 (11.2%)
Hypertension	713 (74.3%)	476 (49.6%)	514 (53.5%)	96 (10.0%)

Majority of the adolescents have heard about Heart disease, Cancer, Diabetes and Hypertension and non-communicable disease. Majority (more than 80%) knew the types, symptoms and presentation of Cancer and Diabetes while three fourth (75.5% and 74.3% respectively) knew about heart disease and hypertension. Almost half of the students had Knowledge about who are at risk of developing this NCDs and whether NCDs are a public health problem. More than half of the adolescents knew that NCDs can be prevented. Few adolescents (around 10%) also had myth that NCDs are communicable. [Table-2]

Table 3: Risk factors NCDs identified by adolescents

Risk Factors	Knows non-communicable diseases			
	Heart disease	Diabetes	Cancer	Hypertension
Alcohol use	287 (29.9%)	37 (03.9%)	704 (73.3%)	80 (08.3%)
Chewing tobacco	151 (15.7%)	28 (02.9%)	839 (87.4%)	58 (06.0%)
Excess salt intake	110 (11.5%)	198 (20.6%)	23 (02.4%)	549 (57.2%)
Excessive anxiety	301 (31.4%)	124 (12.9%)	38 (04.0%)	515 (53.7%)

Fatty diet	343 (35.7%)	334 (34.8%)	46 (04.8%)	229 (23.9%)
Fast food consumption	297 (30.9%)	263 (27.4%)	122 (12.7%)	183 (19.1%)
Obesity	275 (28.7%)	209 (21.8%)	152 (15.8%)	205 (21.4%)
Passive smoking	270 (28.1%)	32 (03.3%)	570 (59.4%)	78 (08.1%)
Reuse of cooking oil	274 (28.5%)	132 (13.8%)	141 (14.7%)	158 (16.5%)
Smoking tobacco	199 (20.7%)	53 (05.5%)	701 (73.0%)	74 (07.7%)
Use of soft drinks	168 (17.5%)	309 (32.2%)	115 (12.0%)	139 (14.5%)
Lack of physical activity	301 (31.4%)	175 (18.2%)	73 (07.6%)	286 (29.8%)

Majority of the prominent risk factors for known NCDs were identified by the studied adolescents. For heart diseases main risk factors reported were fatty diet (35.7%), lack of physical activity and excessive anxiety (31.4%), fast food consumption (30.9%) and alcohol consumption (29.9%). For diabetes fatty diet (34.8%), soft drinks (32.2%) and fast food (27.4%) were the main risk factors mentioned by the students. Majority of the students reported that tobacco chewing (87.4%), alcohol consumption (73.3%) and smoking (73.0%) are the risk factors for various type of cancer. More than half of the adolescents reported excessive salt intake (57.2%), excessive anxiety and stress (53.7%) and lack of physical activity (29.8%) as the risk factors for hypertension. Other risk factors reported were obesity, passive smoking and reuse of cooking oil. [Table-3]

Table 4: Association between socio-demographic variables and knowledge of NCDs

Variables		Reasonably good Knowledge of NCDs		Chi-square value	p value
		Yes	No		
Type of School	Government	70 (15.6%)	378 (84.4%)	10.49	0.0012
	Private	123 (24.0%)	389 (76.0%)		
Gender	Male	125 (21.9%)	447 (78.1%)	2.69	0.1
	Female	68 (17.5%)	320 (82.5%)		
Age group (in years)	13-15	79 (18.5%)	347 (81.5%)	1.19	0.557
	15-17	93 (21.4%)	341 (78.6%)		
	17-19	21 (21.0%)	79 (79.0%)		

Only 193 of the studied 960 adolescents (20.1%) had reasonable knowledge about types, symptoms and nature of non-communicable diseases. This proportion was found to be higher for private school students (24.0%) compared to government school students (15.6%). This difference was statistically significant (chi-square 10.49, df=1, p=0.0012). For male students (21.9%) proportion of reasonably good knowledge was better than female students (17.5%) but the difference was not significant. Association of knowledge with the age group revealed that students more than 15 years of age had better knowledge than who were less than 15 years of age but again the difference was not statistically significant. [Table -4]

Table 5: Association between socio-demographic variables and awareness about risk factors of NCS

Variables		Risk factors of NCDs				
		Alcohol	Tobacco	Faulty dietary habits	Obesity	Physical activity
Type of school	Government	387 (86.4%)	409 (91.3%)	383 (85.5%)	261 (58.3%)	241 (53.8%)
	Private	468 (91.4%)	488 (95.3%)	470 (91.8%)	345 (67.4%)	336 (65.6%)
	chi-square	6.18	6.29	9.59	8.54	13.94
	p value	0.012	0.012	0.001	0.003	0.0001
Gender	Male	494 (86.4%)	525 (91.8%)	500 (87.4%)	354 (61.9%)	344 (60.1%)
	Female	361	372 (95.9%)	353 (91.0%)	252 (64.9%)	233 (60.1%)

		(93.0%)				
	chi-square	10.58	6.31	2.97	0.93	0.0008
	p value	0.001	0.011	0.084	0.334	0.978
Age group (in years)	13-15	378 (88.7%)	393 (92.3%)	373 (87.6%)	265 (62.2%)	253 (59.4%)
	15-17	387 (89.2%)	409 (94.2%)	390 (89.9%)	282 (65.0%)	270 (62.2%)
	17-19	90 (90.0%)	95 (95.0%)	90 (90.0%)	59 (59.0%)	54 (54.0%)
	chi-square	0.14	1.82	1.29	1.52	2.44
	p value	0.931	0.401	0.522	0.466	0.293

Awareness about major risk factors were analyzed to find association with socio-demographic variables. Majority of the private school students identified alcohol (91.4%), tobacco (95.3%) and faulty dietary habits (91.8%), obesity (67.4%) and lack of physical activity (65.6%) as risk factors for NCDs. These proportions among government school students were significantly less (86.4%, 91.3%, 85.5%, 58.3% and 53.8% respectively). Alcohol (93.0%), tobacco (95.9%) and faulty dietary habits (91.0%) were identified as risk factors by female students more than male students (86.4%, 91.8% and 87.4% respectively) and difference in proportion was significant. Obesity and lack of physical activity were identified equally by both the boys and girls. Age wise distribution showed that awareness about major risk factors was almost same in different age groups. [Table-5]

DISCUSSION

This study was conducted in school going adolescents of class 9 to 12 in urban area to assess the awareness about Non-communicable diseases and risk factors associated with them. Adolescence is age of transition and clearly recognized for its vulnerability to adoption of behaviors and life styles predisposing to NCD development.

More than half of the participants in the present study were from private school while rest of the students were in government or grant in aid schools. Present study revealed that almost sixty percent of the studied adolescents were boys. Similar gender distribution was found by Chaitanya Gujjarlapudi *et al.*, (2013) in their study which was done in high school students in urban settings of Guntur showed that (65.5%) were males⁽¹¹⁾ and Kishor Adhikari *et al.*, (2013) in their study on adolescents in Nepal showed that 49.8% were male⁽¹²⁾ Majority of the students in the study were less than 17 years of age (89.6%) and very few students were in 17-19 years of age group (10.4%). It may be because in the study state schools has different criteria for enrollment of the kids in school. S.V.Mane *et al.*, (2012) in their study in Western India, reported similar results that almost 55% of sample was comprised of 16 years of age, 25% students were of 17 years and 8% were of 18 years.⁽¹³⁾

Majority of the adolescents have heard about Heart disease, Cancer, Diabetes and Hypertension as non-communicable chronic diseases. Almost four out of five students knew the types, symptoms and presentation of Cancer and Diabetes while three fourth knew about heart disease and hypertension. Anju *et al.*, (2014) reported that 52.6% of students heard about Cancer. Nearly half students heard of cardiovascular diseases and Diabetes mellitus.⁽¹⁴⁾ Shivalli *et al.*, (2012) in their study reported that nearly one fourth (27.3%) and one third (30.5%) of the students were aware of diabetes and hypertension respectively.⁽¹⁵⁾ Divakaran B *et al.*, (2010) reported that 79.73%, 68.27% and 53.07/% students heard of Cancer, CVD and Diabetes mellitus respectively.⁽²⁾ Comparatively more awareness about NCDs among the participants in present study could be due to increased IEC activities in recent years through various channels. Almost half of the students had Knowledge about vulnerable age group or high-risk population for developing NCDs and whether NCDs are a public health problem. Comparable findings revealed in the study done by Nasir A *et al.*, (2012) that 66.7% mentioned heart disease was the major health problem.⁽¹⁶⁾ But Divakaran B *et al.*, (2010) reported that only 6.1% students thought all the 3 diseases could be public health problem.⁽²⁾ More than half of the adolescents in the present study knew that NCDs can be prevented.

Anju *et al.*, (2014) reported that more than two third of the participants had limited knowledge about the prevention of NCDs and only 37.4% students felt NCDs are preventable.⁽¹⁴⁾ Nasir A *et al.*, (2012) revealed that only 29.2 per cent agreed that CVD were preventable.⁽¹⁶⁾ Divakaran B *et al.*, (2010) reported that 47.5%, 9.6% and 31.7% of the participants felt that diabetes, CVD and cancer could be preventable.⁽²⁾ Few adolescents (around 10%) also had myth that NCDs are communicable. In study done by Divakaran B *et al.*, (2010) 20.5% participants felt that cancer could be communicable followed by Diabetes Mellitus (10.9%) and CVD (2.1%).⁽²⁾ Again different findings in all these studies than present study may be due to increased IEC activities.

On asking the risk factors for NCDs majority of the risk factors were identified by the students but it was observed that knowledge of risk factors was more for cancer followed by hypertension and heart disease. Fatty diet, lack of physical activity, excessive anxiety and stress, fast food consumption and alcohol were the main risk factors for heart disease in decreasing proportion. For diabetes fatty diet, soft drinks and fast food were mentioned by one third of the students (in decreasing proportion) as the main risk factors. More than three fourth of the students reported that tobacco chewing, alcohol consumption and smoking (in decreasing proportion) are the risk factors for various type of cancer. Risk factors identified for hypertension in decreasing proportion were excessive salt intake (57.2%), excessive anxiety and stress (53.7%) and lack of physical activity (29.8%). Surprisingly obesity was not mentioned by many students as risk factor for NCDs as less than one fourth could relate obesity with diabetes, hypertension or cancer and 28.7% mentioned it as a risk factor for heart disease. R Sogarwal *et al.*, (2014) in their study showed that students had good knowledge about the health effect of tobacco use than the use of alcohol. Cancer had been stated as the prominent health concern of tobacco use and alcohol use. Students were also aware that alcohol use can cause cancer followed by high blood pressure.⁽¹⁷⁾ Anju *et al.*, (2014) reported that 76.2% of the students had low awareness of NCDs. Less than one fourth (23.5%) students were aware about 4 to 7 risk factors of NCDs. comprising medium level of awareness and only 0.3% had good level of knowledge of the lifestyle risk factors.⁽¹⁴⁾ Shivalli *et al.*, (2012) in their study reported that Obesity, increasing age and family history were the risk factors of diabetes according to 47.4%, 27% and 27.6% of students respectively. Only one tenth of students considered that alcohol and sedentary life style as risk factor for diabetes. Tobacco use, obesity and alcohol were the risk factors for the hypertension according to 54.1%, 47.4% and 46.9% of the students respectively.⁽¹⁵⁾ Yadav KD *et al.*, (2012) showed that 36.8 percent of respondents had good knowledge, 55.6 percent had fair knowledge and the remaining 7.6 percent had poor knowledge regarding the major risk factors of cardiovascular diseases.⁽¹⁸⁾ Divakaran B *et al.*, (2010) reported that 84.8% of students had low level of awareness and only 0.8% had good knowledge regarding life style risk factors of NCDs.⁽²⁾

Overall knowledge of the studied students was categorized as good knowledge if they have heard about the NCDs, types and nature of the diseases and high-risk population. Analysis was done to find any association of knowledge with few socio-demographic variables. Only one fifth (20.1%) had reasonable knowledge of non-communicable diseases and this proportion was found to be significantly higher for private school students (24.0%) compared to government school students (15.6%). Boys (21.9%) had better knowledge than girl students (17.5%) but the difference was not significant. Students more than 15 years of age had better knowledge than who were less than 15 years of age but again the difference was not statistically significant. Shivalli *et al.*, (2012) in their study also reported that overall awareness of NCDs were better among boys when compared to girls.

Awareness about major risk factors were clubbed as alcohol, tobacco, dietary habits, obesity and lack of physical activity. Analysis was done to find any association with socio-demographic variables. Private school students had better understanding about all the major risk factors and the proportion was significantly higher than government school students. It can be due to the activities and opportunities available to private school students for health awareness. In general girls could be more sensitive to any addictions or diet and its bad effect

on health and it was reflected in the finding that alcohol, tobacco and faulty dietary habits were identified as risk factors of NCDs by girls more than the boys and difference in proportion was significant. Students from each age group showed similar awareness about the risk factors of NCDs. Shivalli *et al.*, (2012) in their study reported that awareness of diabetic risk factors, except for advancing age, was significantly more ($p<0.05$) among boys in comparison to girls. Awareness of high salt intake as risk factor for Hypertension was significantly more in girls while awareness of tobacco use for the same was significantly more ($p<0.05$) among boys⁽¹⁵⁾ which was different from the present study.

CONCLUSION

Overall knowledge about non-communicable disease among school going adolescents was good. Awareness about risk factors of cancer and diabetes was better compared to hypertension and heart disease. Knowledge and awareness about risk factors was better among private school students than government school. Alcohol, tobacco, and faulty dietary habits as the risk factors of NCDs were known to girls more than boys. Obesity was identified as a risk factor of NCD by only quarter of the study participants.

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