

International Journal of Medical Science and Current Research (IJMSCR) Available online at: www.ijmscr.com Volume 4, Issue 2, Page No: 426-434 March-April 2021



A Cross-sectional Study to Assess Modifiable Lifestyle Associated Risk Factors of Noncommunicable Diseases among Secondary School Students

Eshwar K Gupta¹, Monika Patel^{2*}, Jitesh P Mehta³, Dipesh V Parmar⁴

^{1, 2} Resident Doctor, ³ Associate Professor, ⁴ Professor

Department of Community Medicine, Shri M.P Shah Government Medical College, Jamnagar, Gujarat, India

Corresponding Author

Dr. Monika Patel

Resident doctor, Department of Community Medicine Shri M.P Shah Government Medical College Jamnagar, Gujarat, India

Type of Publication: Original Research Paper Conflicts of Interest: Nil

ABSTRACT

Background: Chronic non-communicable diseases (NCD) are a major contributor to the burden of disease. The increasing prevalence of NCDs among adolescents is a significant public health problem. NCDs are largely due to preventable and modifiable risk factors such as high blood pressure, obesity, physical inactivity, psychological factors, unhealthy diet, tobacco use and inappropriate use of alcohol. These factors are associated with life style and behavioural patterns of an individual which are largely results of practices adopted from young age. Therefore, this study aims to identify modifiable lifestyle associated risk factors among secondary school students.

Methods: two stages random sampling method was used to select 34 secondary schools and 852 students studying in 9th and 10th class. A structured pre-coded proforma with the help of WHO Steps Approach was used for data collection.

Results: Out of 852 students, Inadequate intake of fruits and vegetables was more in females (86.61%) as compared to males (75.93%); 80.87% consumed moderate amount of fast food. More than half (55.16%) consumed daily or often weekly. Majority of students (75.47%) ate salty foods daily. Inadequate physical activity was observed in majority (65.61%) students.

Conclusions: There is a high prevalence of modifiable risk factors of the various non communicable diseases among the students. There is a clear depiction of the unhealthy lifestyle of these young students.

Keywords: NCDs, Lifestyle, School, BMI INTRODUCTION

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⁾ In south Asia, half of the disease burden is attributed to non-communicable

diseases. India too, is caught in the midst of transition from the burden of communicable diseases to the burden of non-communicable diseases. ⁽²⁾ The number of NCD deaths has increased worldwide and in every region since 2000, when there were 31 million NCD deaths. In 2016, an estimated 40.5million (71%) of the 56.9 million worldwide deaths were from NCDs. Of these, an estimated 1.7 million (4% of NCD deaths) occurred in people younger than 30 years of age. Chronic non communicable diseases are largely due to preventable and modifiable risk factors such as high blood pressure, obesity, physical inactivity, psychological factors, unhealthy diet, tobacco use and inappropriate use of alcohol. These factors are associated with life style and behavioural patterns of an individual which are largely results of practices adopted from young age. $^{(1)}$

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⁾

The World Health Organization defines adolescence as the time period between 10 years to 19 years of age.⁽⁴⁾Adolescent is a critical period of mental, social and emotional well-being and development. During adolescence brain undergo significant developmental changes, establishing neural pathways and behavioural patterns that will last in to adulthood ⁽⁵⁾. Adolescence is the life stage when the individuals begin to formulate their health habits, setting patterns that continue in to adulthood. Habits and behaviours picked up during adolescence have lifelong impact. ⁽⁶⁾

Health behaviours in childhood are dominated by parental instruction and shared family values. During adolescence young people begin to explore alternatives or adult health behaviours including smoking, drinking alcohol, drug misuse, violence and sexual intimacy. ⁽⁷⁾ Adolescents represent over one fifth of the total population in India. They are a vast current and future resource for their countries. Adolescents carry the highest risk of morbidity and mortality from life style associated diseases. ⁽⁸⁾ NCDs like Obesity, Diabetes Mellitus, Hypertension and Coronary artery diseases in adults have been related to the prevalence of risk factors in childhood.

The increasing prevalence of NCDs among adolescents is a significant public health problem.⁽⁹⁾ Many risk factors for NCDs among adults are associated with behaviours, such as poor dietary habits and physical inactivity, learned during (10) childhood and adolescence. Plasticity and adaptability are fundamental strengths of adolescence, so this life stage is an ideal time to intervene. ⁽¹¹⁾ Realizing the importance of healthy life style and consciously making the decision to adopt one is a necessary first step towards improved health and well-being. ⁽¹²⁾ Early intervention is also important because of the long-term development of chronic conditions and their long duration once they are established. Therefore, this study aims to identify modifiable lifestyle associated risk factors among secondary school students.

AIMS & OBJECTIVES

To study prevalence & distribution of modifiable lifestyle associated risk factors of NCD among secondary school students in the study city.

To assess dietary habits, physical activity, tobacco use, alcohol use among secondary school students.

METHODS

The present study was conducted in the urban areas of the study city covered under Municipal Corporation. It was a school based cross sectional study which was conducted between October 2019-March 2020. Two stage sampling was used. In first stage 34 secondary schools (10% of the total schools) were randomly selected from the list of secondary schools present in the corporation area of the study city. In the second stage 852 subjects studying in class 9th and 10th who were randomly selected from the sampled schools that is an average 25 students from each school. Participants were selected after they gave verbal consent. A structured pre-coded proforma with the help of WHO Steps Approach was prepared in English language for the survey. The study protocol was reviewed and approved by the Institutional Ethical Committee. Permission to conduct the study in the colleges was also taken from the Principals of sampled schools. The data was entered into a computer from the proforma using statistical software Epi Info version 7.2.2.1 and Microsoft Office Excel 2007. The data was then analysed for various parameters and cross tabulation was done using the same software. Chi square test to look for any association between various parameters was applied, with p value < 0.05 considered as statistically significant.

RESULTS

Out of 852 students, majority belong to age 16 (37.08%) followed by age 15 (34.97%) and (27.93%)

were of age 17. Out of total, 57.04% students were male and 42.96% were female. (Graph 1)

On enquiring about the family's monthly income, it was observed that one fourth of the students i.e. 26.76% were from class III followed by 25.35%, 20.66%, 16.43% and 10.80% from class IV, class II, class I and class V respectively. (Graph 2)

According to WHO, at least 400 g (5 portions) of fruit and vegetables a day is recommended, which is considered adequate. It was found that only 19.48% ate fruits and vegetables adequately. Adequate intake of fruits and vegetables was more in males (24.07%) as compared to females (13.39%). Inadequate intake of fruits and vegetables was more in females (86.61%) as compared to males (75.93%). The difference was statistically highly significant. (Table 1)

Out of 852 students, 80.87% consumed moderate amount of fast food (sometimes or rarely). About 7.16% did not eat fast food at all, whereas only 11.97% consumed high amount of fast food (most of the time or every day). High consumption of fast food was slightly more in female (13.39%) as compared to male (10.90%). This difference was statistically significant. (Table 2). 29.58% of students rarely consumed soft drinks whereas more than half (55.16%) consumed daily or often weekly and 15.26% never consumed it. Of this, males (62.55%) consumed more soft drinks daily or often per week as compared to females (45.36%). The difference was statistically significant. (Table 3)

Out of 852 students, 5.63% never ate salty foods like salted salad and buttermilk /wafers/ Papad/pickles and nearly one fifth (18.90%) ate salty foods weekly. Majority of students (75.47%) ate salty foods daily (one or more than one time per day). This proportion of high intake of salt among males (77.37%) was higher than females (72.95%). Difference was statistically not significant. (Table 4)

WHO recommended adequate physical activity for a total of at least 60 minutes per day on all 7 days ⁽¹⁶⁾ Inadequate physical activity was observed in majority (65.61%) students. Adequate physical activity was observed in less than one sixth (14.20%) students. Males (19.75%) were more active than females (6.83%). Whereas one fifth (20.19%) students never

did any form of physical activity. The difference was statistically highly significant. (Table 5)

Out of 852 students the prevalence of smoking (6.46%) was found to be the highest, followed by drinking alcohol (5.05%) and smokeless tobacco (2.93%). All of these were males. (Graph 3)

(Cut off value for waist circumference: Male ≤ 94 cm; Female ≤ 80 cm) ⁽¹⁷⁾ Mean WC was 72.12 ± 9.60 cm. Out of 852 students, 5.99% had high waist circumference (WC). Of these, females showed higher proportion (7.65%) as compared to males (4.73%). The difference was not significant statistically. (Table 6)

(Cut off value for waist hip ratio: Male < 0.90; Female < 0.85) ⁽¹⁷⁾Mean WHR was 0.79 ± 0.06 cm. Out of 852 students 9.51% had high waist-hip ratio (WHR). Of these, females showed higher proportion (13.39%) as compared to males (6.58%). Difference was statistically highly significant. (Table 7)

Students were categorized according to their Body Mass Index (BMI) and it was found that more than half (61.97%) of them had normal BMI. More than one forth (26.29%) were undernourished while 9.74% were (pre obese) overweight. Obesity was seen in only 2.0% of students. Prevalence of obesity was slightly higher in males (2.26%) as compared to females (1.64%). Pre obese were also higher in males (11.32%) as compared to females (7.65%). Difference was statistically highly significant. Mean BMI of present study was 20.94 ± 3.58 kg/m2. (Table 8)

DISCUSSION

Parsekar et al (2015) the study shows that females were 54.42% and males were 45.58%. this was not similar to our study as in these females are in majority as compared to males. Also, they found 28.88% students ate adequate fruits and 18% of the students ate adequate vegetables. ⁽¹³⁾ This finding is similar to our study which shows 19.48% students eating adequate fruits and vegetables. Aparajita et al (2017) study showed that 78% students were consuming soft drink more than 3 times per week. ⁽¹⁴⁾ while in our study it was 55.16%.

Adhikari K et al (2012) study showed that (26.2%) were consuming large amount of salt per day. More number of female respondents (32.9%) were found

.

ထ

consuming high amount of salt per day than male (20.9%). ⁽¹⁵⁾ In our study 75.47% of the students of which (77.37% were male and 72.95% were females) who found to have more salty food per day.

Parsekar et al (2015) study showed that nearly 39% females and 37.96% males mentioned they either use cycle or walk to reach college on all week days. The overall prevalence of inadequate physical activity was found to be high, the number of females involved in physical activity was found to be significantly less. This finding is similar to the present study. ⁽¹³⁾

Parsekar et al (2015) study showed that the prevalence for smoking was 0.9 % and 3.4 % among females and males respectively. Prevalence of smokeless tobacco among males and females was 1.3% and 0.2% respectively. About 4.2 % and 9.2% females and males respectively had history of consuming alcohol at least once in the past. ⁽¹³⁾ This finding is not similar to the present study.

S.V.Mane et al (2012) reported that 5% boys and 2% girls smoked one to seven cigarette or beedis per day, Tobacco chewing was seen in 4% boys and 3% girls. Alcohol was seen to be consumed up to one to three drinks by 7% of boys and 3% of girls ⁽¹⁸⁾. In our study no females were found to have any kind of addiction.

Arora et al (2018) in the study showed that 7.72% students had high waist circumference, which is similar to our study.⁽¹⁹⁾

Singh, et al (2015) showed that the prevalence of abdominal obesity (high WC) was three times higher among females as compared to males in all the age groups. $^{(20)}$

Singh, et al (2015) showed that the prevalence of high WHR was significantly higher among males as

compared to females, indicating more abdominal fat accumulation ⁽²¹⁾ which is not similar to present study.

Arora et al (2018) in her study showed that 20.64% students were underweight, 75.66% were normal, 3.10% were overweight and 0.30% was obese. ⁽²⁰⁾ These observations are slightly different than our study.

CONCLUSION

The study was done to find out the prevalence of modifiable risk factors of non-communicable diseases among secondary school students (class 9th and 10th) of the study city. It was found that majority of the students weren't doing adequate physical activity, nor were they eating fruits and vegetables adequately, thus keeping them at a high amount of risk for developing the non-communicable diseases. The prevalence of addiction that was observed in the study was relatively quite low, in terms of smoking tobacco, alcohol and chewing tobacco. But this can be due to their tendency to hide their addiction and fear of getting caught. Both waist circumference as well as waist-hip ratio was found to be higher among females as compared to males. As far as BMI was concerned, more females were undernourished as compared to males, whereas more males were overweight and obese in comparison to the females.

From the observations of the present study, we can conclude that there is a high prevalence of modifiable risk factors of the various non communicable diseases among the students. There is a clear depiction of the unhealthy lifestyle of these young students. Hence, this calls for an urgent need to take early preventive steps which are primordial as well as primary in nature so as to put a break on the increasing risks of developing some of the major non communicable diseases among the young students.

"Table 1: DISTRIBUTION OF STUDENTS ACCORDING TO ADEQUACY OF EATING FRUITS AND VEGETABLES"

Adequacy of eating fruits and vegetables	Male		Female		Total	
	No.	%	No.	%	No.	%
Adequate	117	24.07	49	13.39	166	19.48
Inadequate	369	75.93	317	86.61	686	80.52

Eshwar K Gupta et al International Journal of Medical Science and Current Research (IJMSCR)

Total	486	100	366	100	852	100		
χ 2= 15.19, p< 0.001 Statistically Highly significant								

"Table 2: DISTRIBUTION OF STUDENTS ACCORDING TO HABIT OF EATING FAST FOOD"

Frequency of	Male		Female		Total		
eating fast food	No.	%	No.	%	No.	%	
High	53	10.90	49	13.39	102	11.97	
Moderate	389	80.04	300	81.97	689	80.87	
Never	44	9.06	17	4.64	61	7.16	
Total	486	100	366	100	852	100	
$\chi 2= 6.83$, p< 0.05 Statistically significant							

"Table 3: DISTRIBUTION OF STUDENTS ACCORDING TO HABIT OF DRINKING SUGAR SWEETENED SOFT DRINK"

Frequency of soft drinks	Male		Female		Total		
	No.	%	No.	%	No.	%	
Daily or weekly	304	62.55	166	45.36	470	55.16	
Rarely	112	23.05	140	38.25	252	29.58	
Never	70	14.40	60	16.39	130	15.26	
Total	486	100	366	100	852	100	
$\chi 2= 28.05$, p< 0.0001 Statistically Highly significant							

"Table 4: DISTRIBUTION OF STUDENTS ACCORDING TO FREQUENCY OF EATING SALTY FOOD"

Salty food	Male		Female		Total		
	No.	%	No.	%	No.	%	
Never	26	5.35	22	6.01	48	5.63	
Weekly	84	17.28	77	21.04	161	18.90	
Daily	376	77.37	267	72.95	643	75.47	
Total	486	100	366	100	852	100	
$\chi 2= 2.26$, p>0.05 Statistically not significant							

Page4

Female Total Male Adequacy of physical activity % % No. No. % No. 96 19.75 25 6.83 121 14.20 Adequate 303 62.35 256 559 Inadequate 69.95 65.61 87 23.22 172 20.19 Never 17.90 85 486 100 Total 100 366 100 852 χ 2= 29.31, p< 0.001 Statistically Highly significant

"Table 5: DISTRIBUTION OF STUDENTS ACCORDING TO ADEQUACY OF PHYSICAL ACTIVITY"

"Table 6: DISTRIBUTION OF STUDENTS ACCORDING TO WAIST CIRCUMFERENCE"

Waist	Male		Female		Total		
circumference	No.	%	No.	%	No.	%	
Normal	463	95.27	338	92.35	801	94.01	
High	23	4.73	28	7.65	51	5.99	
Total	486	100	366	100	852	100	
Mean ± SD	72.18 <u>+</u> 9.59		72.12 <u>+</u> 9.63 72.12 <u>+</u> 9.60				
$\chi 2= 3.16$, p > 0.05 statistically not significant							

"Table 7: DISTRIBUTION OF STUDENTS ACCORDING TO WAIST-HIP RATIO"

Waist-Hip ratio	Male		Female		Total		
	No.	%	No.	%	No.	%	
Normal	454	93.42	317	86.61	771	90.49	
High	32	6.58	49	13.39	81	9.51	
Total	486	100	366	100	852	100	
Mean ± SD	0.793+0.06		0.794+0.05 0.79+0.06				
χ^2 = 11.23, p < 0.001 statistically highly significant							

"Table 8: DISTRIBUTION OF STUDENTS ACCORDING TO BODY MASS INDEX"

BMI	Male		Female		Total	
Divil	No.	%	No.	%	No.	%
Undernourished	103	21.19	121	33.06	224	26.29
Normal	317	65.23	211	57.65	528	61.97
I	-					<u></u>

Eshwar K Gupta et al International Journal of Medical Science and Current Research (IJMSCR)

Pre-obese	55	11.32	28	7.65	83	9.74	
Obese	11	2.26	6	1.64	17	2.00	
Total	486	100	366	100	852	100	
Mean ± SD	20.95 ± 3.59		20.95 ± 3.60		20.94 ± 3.58		
χ^2 = 16.40, p < 0.001 statistically highly significant							

"Graph 1: Age and gender-wise distribution of study participants (%)"



"Graph 2: Distribution of students according to social class (%)"





"Graph 3: Distribution of students according to addiction status"

ACKNOWLEDGEMENTS

My utmost gratitude to my esteemed teacher Dr Jitesh P Mehta sir for his constant guidance and advice and support. I am also grateful to Dr Dipesh V Parmar sir for his support throughout this project. Thanks to all my colleagues, seniors and juniors for their help and motivation.

REFERENCES

- Thandi Puoana, Lungiswa Tsolekile, David Sanders, Whadiah Parker. Chronic noncommunicable diseases. [internet].http://www.hst.org.za/uploads/files/ chap5_08.pdf
- Divakaran B, Muttapillymyalil J, Sreedharan J, Shalini K. Lifestyle risk factors of noncommunicable: Awareness among school children . Indian Journal Cancer. 2010 July; 47: 9 13.
- 3. Mohan V, Deepa R. Risk factors for coronary artery disease in Indians. J Assoc Physicians India 2004;52:95-7.
- K. Park. Park's Textbook of Preventive and Social Medicine, Twenty-fourth edition. Banarsidas Bhanot Publishers, Jabalpur, 2017.

- 5. Susan Wile Schwarz. Adolescent mental health in the United States [internet]. 2009 Available from: http://www.nccp.org/publications/pdf/text_87 8.pdf.
- Kathieem Mullan Harris, Rasalind Berkowitz King, Penny Gordon-Larsen. Healthy habits among adolescents: Sleep, exercise, diet, and body image [internet].2003 Availablefrom:http://www.childtrends.org/Fil es/Child_Trends-2003-03-12
- Russell Vinar, Aidan Macfarlane. Health promotion [internet].2005 Available from: http://www.ncbi.nlm.nih Gov/pmc/articles/PMC552817.
- 8. Promoting healthy life style behaviors for adolescent [internet] 2009. Available from:http://www.childtrends.org/Files/Child_Trends2003_03_12_PD_PDConfHKG.
- 9. Michaud PA, Suris JC, Viner R. The adolescent with a chronic condition: epidemiology, developmental issues and health care provision. Geneva (CH): World Health Organization; 2007.
- 10. Baldwin W, Kaneda T, Amato L, Nolan L. Noncommunicable diseases and youth: a

Eshwar K Gupta et al International Journal of Medical Science and Current Research (IJMSCR)

critical window of opportunity for LatinAmerica/Caribbean. Washington (DC): Population ReferenceBureau; 2013.

- 11. Lerner RM, Lerner JV, von Eye A, Bowers EP, Lewin-BizanS. Individual and contextual bases of thriving in adolescence: aview of the issues. J Adolesc 2011;34(6):1107–14.
- 12. Maidives. Global School Based Student Health Survey Maldives Report 2009.Implemented by Ministry of Education in collaboration with Ministry of Health and Family[internet]. 2011 MarAvailable from; http://www.ncbi.nm.nih.gov/pmc/articles/pmc 276954.
- 13. Parsekar, S. S., Ashok, L., Monteiro, A. D., Singh, M. M., & V, B. T. (2015). Modifiable life style associated risk factors for non communicable diseases among students of pre - university college of Udupi taluk. *GLOBAL JOURNAL OF MEDICINE AND PUBLIC HEALTH 1 Www.Gjmedph.Org*, 4(2), 2277–9604.
- 14. Dasgupta A, Karmakar A, Bandyopadhyay L, Garg S, Paul B, Dey A. How vulnerable are our adolescents to noncommunicable diseases? A school-based study in Kolkata. International Journal of Health & Allied Sciences. 2017 Oct 1;6(4):199.

- 15. Adhikari K, Adak M R Behavioural risk factors of non-communicable diseases among adolescents Journal of Institute of Medicine, December 2012: 34:3 39-43.
- 16. who factsheet on Physical activity updated on January 2015.
- 17. Waist Circumference and Waist–Hip Ratio: Report of a WHO Expert Consultation Committee, Geneva, 8–11 December, 2008.
- S.V.Mane et al, Study of risk factors for lifestyle diseases among adolescents in Western IndiaInt J Pharm Biomed Sci 2012, 3(4), 224-228.
- Arora, M., Mathur, C., Rawal, T., Bassi, S., Lakshmy, R., Nazar, G. P., Kinra, S. (2018). Socioeconomic differences in prevalence of biochemical, physiological, and metabolic risk factors for non-communicable diseases among urban youth in Delhi, India. *Preventive Medicine Reports*, 12(47), 33–39. https://doi.org/10.1016/j.pmedr.2018.08.006
- 20. Singh S, Issac R, Benjamin AI, Kaushal S.Prevalence and Association of Physical Activity with Obesity: An Urban,Community-Based, Cross-Sectional Study. Indian J Community Med2015;40:103-7.