Original Research Article

# A study on prevalence of risk factors of non-communicable diseases and to assess awareness regarding non-communicable diseases and its risk factors among adolescents

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## Abstract

Background: The major and potentially preventable risk factors of NCDs are associated with lifestyle and behaviour pattern which are largely due to practices adopted in younger age. Knowledge of adolescents about non-communicable diseases and their risk factors are an important part of population-based prevention strategy. Objectives: To assess prevalence of NCDs risk factors among adolescents and to study awareness regarding NCDs and their risk factors. Material & Methods: It was a cross sectional study. 400 students of adolescent age from private school were interviewed over a period of four months. Data was entered and analysed statistically using Excel 2010 and Epi info software. Results: Majority of participants were from age 15-17 years. 7.25% were overweight and only 1% were Obese. Physical inactivity prevalent in 76.75%, Family history in 41.25%, Inadequate sleep in 43.50% and tobacco habit in 21%, Frequent junk food consumption in 75.75%, Lack of yoga meditation in 79.75%. Awareness was excellent for Diabetes and Hypertension. Regarding risk factors, 87% were aware about tobacco consumption, 94% about alcohol consumption, 69.50% about passive smoking, 91.50% about fast food consumption, 82% about excess salt intake, 79.50% about physical inactivity and 73.25% aware about obesity. Conclusions: Awareness was excellent regarding NCDs and their risk factors, but the prevalence of risk factors was high among adolescent. Fair numbers adolescents were following high risk practices. These results have highlighted the fact that there is an urgent need to take effective steps, to prevent this problem.

**Keywords:** Non-communicable diseases, Risk factors, Adolescents.



## Introduction

Non communicable diseases (NCD) are the major cause of global deaths accounting for 71% of annual deaths in 2015 [1]. In the last few years, there has been a changing pattern of disease profile from acute infectious communicable disease to chronic non communicable disease [2]. Cardiovascular diseases, diabetes mellitus, and stroke have emerged as major non communicable diseases of public health importance in India, with morbidity and mortality in the most economically productive years of life posing a challenge to society as well as the economy of the nation [3]. NCDs have common risk factors such as tobacco use, unhealthy diet, physical inactivity, high alcohol consumption, raised blood pressure, and excess adiposity. The policies and programs focusing on reducing the burden of these common risk factors are likely to make a substantial impact on mitigating the mortality and morbidity due to non-communicable diseases [4]. The major and potentially preventable risk factors of NCDs are associated with lifestyle and behaviour pattern which are largely due to practices adopted in younger age. Intermediate school children (adolescents) are known for experimentation and are vulnerable to adopt certain lifestyles which may predispose them to non-communicable diseases [5]. The term 'Adolescence' is derived from a Latin word 'Adolescere' meaning 'to grow', 'to mature'. It is a period of transition from childhood to adulthood. This transitional stage extends from 10 to 19 years. It is characterized by rapid physical growth and significant physical, psychological, emotional and spiritual changes. Many serious chronic diseases in adulthood have their roots in adolescence. For example, tobacco and alcohol use, sexually transmitted infections (STIs) including HIV, poor eating and exercise habits lead to illness or premature death later in life [6]. Adolescents constitute 21% of India's total population, making it to be the largest in the world. The health status during this phase of growth and development has an important bearing on the overall health during his/her adulthood. Their ongoing transitional state of neural, psychological and physical development makes them susceptible to certain behavioural risk factors like tobacco use, alcohol consumption, unhealthy diet and insufficient physical activity. However, acquisition of these unhealthy behaviours often persists lifelong. This increases the risk of developing non-communicable diseases (NCDs) like cardiovascular diseases, respiratory diseases, diabetes, hypertension, cancers and mental disorders from early adulthood onwards [7]. It has been estimated that the burden of non-communicable diseases can be reduced to half or lesser by prioritizing interventions like health education, health promotion, and disease prevention which can be achieved by focusing on modifiable risk factors the roots of which begin as early as in childhood [8]. Schools can play a major role in creating awareness, imparting knowledge and slowly and steadily changing practices and behaviour in the children, parents and finally that of the community. A child spends a significant amount of time at school and as the schools shape the behaviour of the children, it is essential to assess the school related factors affecting the non-communicable diseases risk factors [9]. The awareness and knowledge of adolescents regarding non-communicable diseases and their risk factors are an important part of population-based prevention strategy. Assessing and appropriately disseminating knowledge of the modifiable risk factors at an early age are an essential part of preventive educational approach. The awareness levels in adolescents could be used as a baseline on which health promotional strategies can be developed. With this context, this study was conducted with an objective to assess the prevalence of common non communicable risk factors among adolescents and awareness and their attitude towards non communicable diseases and their risk factors among adolescent in the Junagadh city. This study also sensitizes these adolescents, so that they change their behaviour and acquires healthy life style.

## Material and Methods

A cross sectional study was conducted among school children in Junagadh city. It was a school based cross sectional study carried out between July to October 2019 to accomplish the study objectives.

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Using single population proportion formula a sample size of 384 was calculated by taking the proportion of adolescents using tobacco in any form as 13.1%. With 95% confidence level, 5% absolute precision, design effect of 2 and nonresponse rate of 10% the final sample size was calculated as 385, which were rounded off to 400 [10]. The Sample was drawn through systematic random sampling technique and out of total 400 sample size, we selected 200 boys and 200 girls studying in selected private high school at Junagadh city and between 12 – 18 years of age.

Sampling criteria

Inclusion criteria: Students who are adolescent girls and boys, age between 12-18 years, able to read, write and understand local language

Exclusion criteria: Students who are not available during data collection period and not willing to participate in the study.

A predesigned, pretested, semi-structured self-administered questionnaire was used for data collection in this study. It consisted of questions pertaining to awareness regarding common NCDs like Diabetes mellitus, Hypertension, Cancer, obesity and their risk factors. The study tool was translated to local language for better understanding of the questions and anonymity was maintained throughout the study. Prior permission was obtained from the school principals before the data collections. Informed written consent from the school authorities and assent from the participating students were procured. All students were interviewed personally by the investigator. Standardised instruments and techniques were used for anthropometric measurements such as height and weight of the students. A standardised, calibrated digital weighing scale was used to measure the weight. The weight of the students was obtained while the students stood upright barefooted on the weighing machine. The height was measured by standardised, calibrated stadiometer. The height was recorded in centimetres while the students stood straight with horizontal gaze and barefooted. Blood pressure was measured using digital sphygmomanometer. WHO Standard Growth Reference for BMI for specific age and gender was used as reference standards. BMI was computed using the formula: BMI = bodyweight in kilograms divided by height in meters squared [11]. The data so obtained was entered into a MS excel software and analysed using MS excel and Epi info software. Frequency and proportion were used for data analysis. Chi square test was applied to find out association between variables. P value < 0.05 considered as significant.

**Result:**

A total of 400 students were participated in the study. Out of this 400 sample size, 200 (50%) were boys and remaining 200 (50%) were girls. Only 16 (4%) students were from 14 years, 74 (18.5%) were from 15 years age, maximum students i.e., 170 (42.5%) were from 16 years, 130 (32.5%) were from 17 years age and remaining 10 (2.5%) were from 18 years of age. We select both male and female study participant equally in all mentioned age, so that we have 200 male and 200 female participants (table 1).

**Table 1: Distribution of study subjects according to age and sex**

| Age (in complete years) | Gender | | Total No. (%) |
|---|---|---|---|
| | Male | Female | |
| 14 | 8 | 8 | 16 (4) |
| 15 | 37 | 37 | 74 (18.50) |
| 16 | 85 | 85 | 170 (42.50) |
| 17 | 65 | 65 | 130 (32.5) |
| 18 | 5 | 5 | 10 (2.5) |
| Total | 200 | 200 | 400 (100) |

Majority of study participants (43.25%) were having normal BMI status, followed by 41.50% participants were underweight. 7.25% study participants were overweight, 7% participants were pre-obese and only 1% participants were Obese as per their BMI status. Overweight was seen more in female 17 (8.5%) as compared to male 12 (6%), while pre-obese and obese were seen more in male as compared to female, and this difference was statistically significant (table 2).

**Table 2: Distribution of study subjects according to BMI status**

| Nutritional status / BMI | Male (%) | Female (%) | Total (%) |
|---|---|---|---|
| Underweight | 94 (47) | 72 (36) | 166 (41.50) |
| Normal | 74 (37) | 99 (49.5) | 173 (43.25) |
| Overweight | 12 (6) | 17 (8.5) | 29 (7.25) |
| Pre-Obese | 17 (8.5) | 11 (5.5) | 28 (7) |
| Obese | 3 (1.5) | 1 (0.5) | 4 (1) |
| Total | 200 (100) | 200 (100) | 400 (100) |

(Chi square value- 9.67, p value- 0.046)

Regarding risk factors of NCDs, it was seen that lack of physical activity was highly prevalent in around 307 (76.75%) of study participants. Family history of at least one or more NCDs was seen in 165 (41.25%) study participants. Inadequate sleep was prevalent in 174 (43.50%) participant and tobacco/smoking habit prevalent in 84 (21%) of study participants. Regarding diet, frequent junk food and soft drinks consumption was seen in 303 (75.75%) of study participant, lack of green leafy vegetable and fruits in daily diet was seen in around 106 (26.50%) of study participant. Lack of yoga and meditation was seen in 319 (79.75%) of study participant (table 3).

**Table 3: Distribution of study subjects according to presence of risk factors of NCDs**

| Risk factors of NCDs | Present | Percentage(%) | Absent | Percentage(%) |
|---|---|---|---|---|
| Lack of Physical activity or Exercise | 307 | 76.75 | 93 | 23.25 |
| Family history | 165 | 41.25 | 235 | 58.75 |
| Inadequate sleep | 174 | 43.50 | 226 | 56.50 |
| Tobacco/smoking habit | 84 | 21 | 316 | 79 |
| Lack of green leafy vegetables in diet | 106 | 26.50 | 294 | 73.50 |
| Frequent junk food, fast food and soft drinks in diet | 303 | 75.75 | 97 | 24.25 |
| Extra salt in food | 220 | 55 | 180 | 45 |
| Lack of yoga and meditation | 319 | 79.75 | 81 | 20.25 |

Regarding awareness about NCD and its risk factors, the results revealed that 93.75% of the participants had heard of NCDs. Awareness about individual NCDs was excellent about Diabetes Mellitus (76.25%) and Hypertension (66.25%). For other NCDs like stroke and coronary heart disease, awareness was found to be around nearly 50%. Around 85% of participants thought that NCDs were becoming a leading public health problem. Awareness about risk factors of NCDs was excellent. 87% participants were aware about tobacco consumption as a risk factor and 94%

were aware about alcohol consumption. 69.50% participants also correctly said passive smoking as a risk factor of NCDs. Awareness regarding diet as a risk factors was excellent, 91.50% participants were aware about fast food consumption and 82% were aware about excess salt intake in diet as a risk factors. 79.50% participant were aware about physical inactivity and 73.25% were aware about obesity as a risk factors of NCDs. Awareness about various complication of NCDs was high, 78% among participants. 95% of the participants were correctly said NCDs were preventable and knowledge regarding preventive measures for NCDs was good in study participants (table 4).

**Table 4: Awareness about NCDs and its risk factors among study participants (N=400)**

| Knowledge about NCDs and its risk factors | Yes (%) | No (%) |
|---|---|---|
| Have heard of NCDs? | 375 (93.75) | 25 (6.25) |
| Awareness about individual NCD | | |
| Hypertension | 265 (66.25) | 135 (33.75) |
| Diabetes Mellitus | 305 (76.25) | 95 (23.75) |
| Obesity | 279 (69.75) | 121 (30.25) |
| Stroke | 238 (59.50) | 162 (40.50) |
| Coronary heart diseases | 202 (50.50) | 198 (49.50) |
| NCDs are becoming leading public health problem? | 340 (85) | 60 (15) |
| Awareness about common risk factors of NCDs | | |
| Cigarette/bidi smoking | 348 (87) | 52 (13) |
| Alcohol consumption | 376 (94) | 24 (6) |
| Passive smoking | 278 (69.50) | 122 (30.50) |
| Obesity | 293 (73.25) | 107 (26.75) |
| Junk food/fast food | 366 (91.50) | 34 (8.50) |
| Lack of Physical activity | 318 (79.50) | 82 (20.50) |
| Excess of salt consumption | 328 (82) | 72 (18) |
| Awareness about complications of NCDs | 312 (78) | 88 (22) |
| Are NCDs preventable? | 380 (95) | 20 (5) |

In more than one third participants (37%), the source of information was either doctors or health workers, followed by 33% participant in which source of information was friends or relatives. Media as a source of information in around 19% of the cases (figure 1).

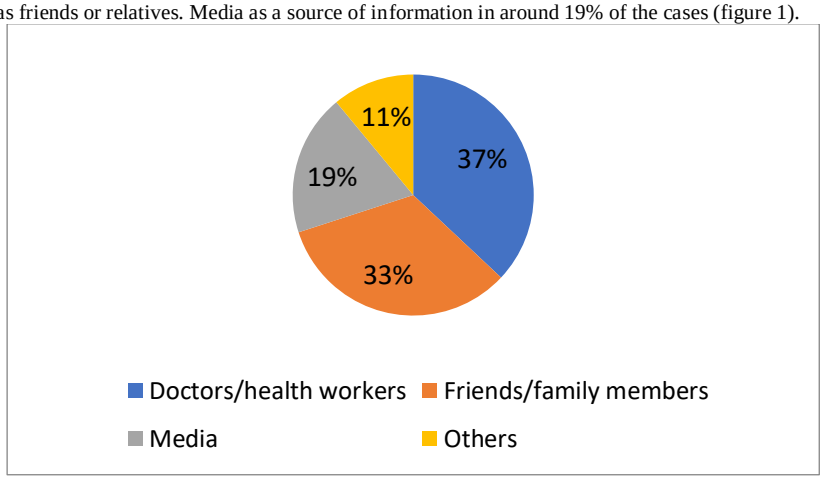


**Fig 1:Sources of knowledge regarding NDCs**

**Discussion**

Adolescence is a formative period of life. It is a crucial period because major physical, psychological and social changes take place. Many serious chronic diseases in adulthood have their roots in adolescence. Habits and behavioral changes developed during adolescence, will continue in future life. Because of inquisitiveness and desire for experimentation, the teenagers want to experience the effect of smoking, alcoholic drinks and even sexual intercourse, without knowing the adverse effects and often become the victims. Hence, awareness and knowledge regarding NCDs in this particular age group are of immense public health importance. Health education remains a long-term measure of NCDs prevention. The current study intended to assess the awareness levels among this particular age group regarding NCDs and their risk factors and also study the prevalence of these risk factors among adolescent. 400 students were participated in the study. Half of these participants were boys and half were girls. Majority of study participants (93.5%) were from age group 15-17 years. Similarly 53.1% boys and 46.9% girls were participated in study done by Shivalli S et al and also majority 89.5% of participant were in age group of 16-18 years [12]. Similar type of study participants were selected in study done by Gupta et al [3]. Prevalence of overweight was around 7.25% and obesity was 8% found in our study. Thomas et al in their study found prevalence of overweight was 12.27% which was higher than our finding, but prevalence of obesity was 3.86% which was lower than our finding [13], similarly Sreena TV et al in their study found prevalence of overweight was 13.2% which was higher than our finding [14].

Prevalence of NCDs risk factors was high among study participants. Among the NCD risk factors, physical inactivity was highly prevalent (76.75%) followed by frequent junk food and soft drinks consumption which was seen in 75.75% of study participant. Family history of NCDs was seen in 41.25% participants, inadequate sleep was prevalent in 43.50% participant and tobacco/smoking habit prevalent in 21% participants. Lack of yoga and meditation was seen in 79.75% of participant. Sreena TV et al in their study also reported high prevalence of NCD risk factors among study sample. In their study they reported consumption of packed food was most prevalent 67%, physical inactivity prevalent in 41% and least prevalent risk factor was tobacco use of 4.7% [14]. Kumar et al in their study reported prevalence of tobacco user was 16.4% [15]. The results revealed that

93.75% of the participants had heard of NCDs. Awareness about individual NCDs was very good, for Diabetes Mellitus it is 76.25% and for Hypertension (66.25%). Around 85% of participants thought that NCDs were becoming a leading public health problem. Similar finding was also observed by Gupta et al in their study. They reported 80.85% had heard of NCDs, and also awareness about hypertension and Diabetes mellitus was excellent among study subjects [3]. Mane et al reported awareness about DM was 77.5%, which is similar to our finding [16]. Goel et al in their reported knowledge about hypertension was 65.3% and for Diabetes mellitus it was 58.3% [17].

Awareness about risk factors of NCDs was excellent. More than three forth of participants were aware about tobacco consumption, alcohol consumption, frequent fast food diet, excess salt intake in diet, and physical inactivity as risk factors of NCDs. Gupta et al and Shivalli et al also observed similar kind of result regarding risk factors of NCDs in their study [3,12]. Though the study participant's awareness about risk factors of NCDs was very good, but they had very casual attitude towards it and they did not follow good practice and that is the reason why prevalence of most of the risk factors was high among them. Awareness about various complication of NCDs was high, 78% among participants. 95% of the participants were correctly said NCDs were preventable and knowledge regarding preventive measures for NCDs was good in study participants. Gupta et al in their study also observed similar finding [3]. In more than one third participants, the source of information was either doctors or health workers, followed by 33% participant in which source of information was friends or relatives. Media as a source of information in around 19% of the cases. In contrast to the results of the current study, Gupta et al reported media as a source of knowledge in majority of cases (60.18%), followed by friends/relatives (22.55%) and doctors/health workers (16.02%) [3].

A very good awaeness regarding most of NCDs and its risk factors among study participants could be explained on following ground. The good awareness may have been acquired by the participants from academic curriculum as well as print/electronic media. Study participnats from private school may also be a reason for these results. Although the awareness of NCDs and its risk factors was excellent among adolescents, prevalence of most of the risk factors was very high. Many of the study participants had casual attitude towards various life modification measures and did not follow healthy lifestyle practice.

**Limitation**

Our study is not without limitations. The study was limited to adolescent age group. The interpretations are restricted to school going adolescent students only. Further studies are needed that cover the groups of adolescents who are out of school, as the prevalence of health risk behaviours is likely to be higher among such adolescents.

**Conclusion**

Awareness among the study participant was fairly good to excellent regarding NCDs and their risk factors. Although a positive sign, the prevalence of one or more risk factors was also common among adolescent. Fair numbers adolescents are following high risk practices and even are having all the hidden conditions of non-communicable diseases like hypertension and obesity which are not usually diagnosed and paid attention. These results have highlighted the fact that there is an urgent need to take effective steps, to preventing this problem among adolescents. A school should play an active role in imparting awareness regarding NCDs and its risk factors. On another side parents need to provide more support, care and help their children to adopt healthy lifestyle in order to keep away these chronic diseases. As it has been well established that risk factors for NCDs are of multiplicative nature, the need is to promote community-based behavioural and lifestyle-related interventions.

**Conflict of Interest: Nil Source of support: Nil**

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