

SOCIODEMOGRAPHIC AND BEHAVIORAL RISK FACTORS OF NONCOMMUNICABLE DISEASES AMONG SELECTED ADOLESCENTS IN URBAN HYDERABAD

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ABSTRACT

Introduction: Noncommunicable diseases (NCDs) such as cardiovascular diseases, diabetes, cancers, and chronic respiratory illnesses are the leading cause of global mortality. The increasing burden among adolescents is particularly concerning due to the long-term implications. This study assesses the prevalence of risk factors associated with NCDs among adolescents in an urban field practice area in Hyderabad, Telangana. **Methods:** A community-based cross-sectional study was conducted among 400 adolescents aged 10–19. Participants were selected using simple random sampling. Data was collected using a semi-structured interview schedule, anthropometric measures, and validated tools like the International Physical Activity Questionnaire (IPAQ) and Perceived Stress Scale (PSS). Variables included sociodemographic factors, behavioural habits, Body Mass Index (BMI), and family history of NCDs. Descriptive statistics and chi-square tests were used to analyze associations. **Results:** Of the 400 adolescents, 62% were male. Major risk factors identified included low physical activity (57.75%), junk food consumption (61.75%), passive smoking exposure (42.25%), alcohol consumption (6.5%), and high stress (63%). About 20% were overweight and 0.5% obese. 31.75% reported a family history of NCDs.

A significant association was found between higher Body Mass Index (BMI >24.9) and socio-economic status ($p=0.001$). At the same time, other risk factors such as smoking, alcohol consumption, physical inactivity, and stress showed no significant association. **Conclusion:** Adolescents in urban Hyderabad show a high prevalence of modifiable NCD risk factors. Preventive strategies, including lifestyle modification, health education, and targeted interventions, are imperative during adolescence to reduce future NCD burden.

Keywords: Adolescents, Noncommunicable Diseases, Risk Factors, Urban Health

INTRODUCTION

Noncommunicable diseases (NCDs), including cardiovascular disease, cancer, diabetes, and chronic respiratory illness, account for nearly 70% of global mortality, with 82% of 16 million premature deaths occurring in low- and middle-income countries¹. Driven by modifiable behaviours—tobacco use, physical inactivity, harmful alcohol use, and unhealthy diet—NCDs are increasingly threatening health systems, particularly in resource-limited settings. (World Health Organisation, 2024)

Adolescence is a critical period for establishing health behaviours that persist into adulthood. During this stage, individuals develop dietary and physical activity patterns, emotional coping strategies, and risk-related behaviours, shaped significantly by familial, educational, and community environments. (National Academies of Sciences, Engineering, and Medicine, 2019)

In India and other developing countries, the burden of NCDs is rising rapidly, contributing substantially to adult morbidity and mortality, especially among those aged 35–64 years. (World Health Organisation, 2023)

Noncommunicable diseases (NCDs) account for approximately 41 million deaths annually, representing 74% of all global deaths. Cancer ranks as the second leading cause of death worldwide, following cardiovascular disease. (Union for International Cancer Control, 2024)

The shift from communicable diseases (CDs) to noncommunicable diseases (NCDs) as the predominant health burden is a growing global trend, especially evident in low- and middle-income countries such as India.

In addition to established risk factors such as tobacco use, unhealthy diets, physical inactivity, and harmful alcohol use, increased screen time has a significant impact on adolescents by contributing to childhood obesity, which intensifies the risk of noncommunicable diseases in adulthood. (Chetry & Collins, 2024)

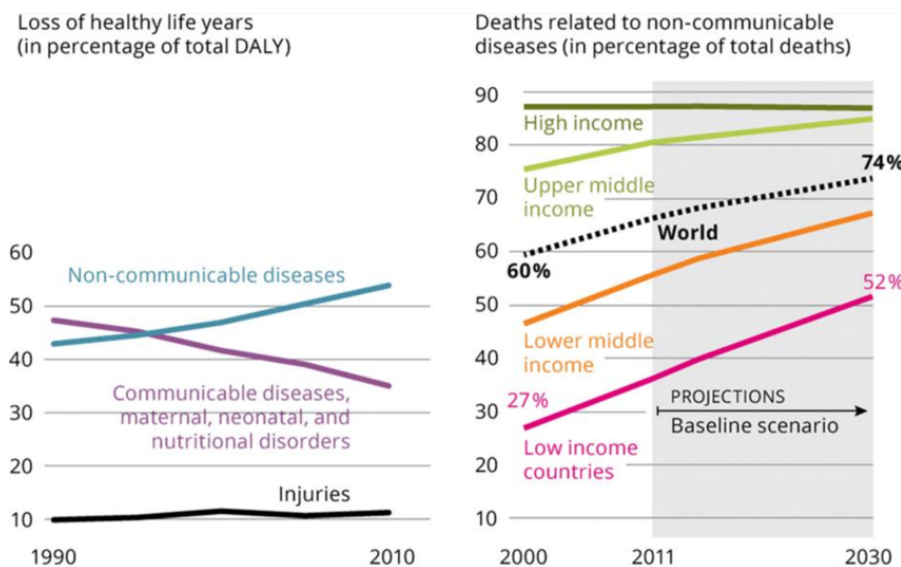


Figure 1: The global health burden has shifted from communicable to noncommunicable diseases
(Source: Mahmood, Ali, & Islam, 2013)

Several environmental risk factors contribute significantly to the burden of noncommunicable diseases (NCDs), with air pollution—both indoor and outdoor—being the most prominent. It is estimated to cause 6.7 million deaths globally, of which about 5.6 million are due to NCDs, including stroke, ischemic heart disease, chronic obstructive pulmonary disease, and lung cancer.

Understanding the impact of NCDs on quality of life and assessing their burden at the community level is essential to guide effective public health strategies.

With this background, the present study aims to assess the community's true burden of noncommunicable diseases (NCDs). It highlights the need for appropriate behavioural change communication to enhance quality of life.

The present study aims to assess the risk factors of noncommunicable diseases (NCDs) among adolescents by evaluating the presence of various NCD-related risk factors and analyzing their associations with sociodemographic characteristics.

METHODS

A community-based cross-sectional study was conducted over two years in the Urban Field Practice area of Osmania Medical College, Harrazpenta, Hyderabad, which has a total population of 57,321 and an adolescent population of 2,728. Adolescents aged 10–19 years in this area formed the study population. Those with chronic illness or without parental consent were excluded. The study area was chosen as it is the designated urban field practice area under Osmania Medical College, ensuring accessibility, population data availability, and feasibility of community-based research. Only one study location was included.

The sample size was calculated as 384 using the formula $N = Z^2PQ/L^2$, assuming 50% prevalence (Naing, Nordin, Abdul Rahman, & Naing, 2022) study), 5% absolute error, and 95% confidence interval, and was rounded to 400. A simple random sampling technique was used. A line listing of adolescents was prepared with the help of ASHA and Anganwadi workers, and random numbers were generated using Microsoft Excel 2010. Each household with adolescents was listed and assigned a number, and random numbers were drawn from this list to select participants.

Data were collected through house-to-house visits using a semi-structured questionnaire after obtaining verbal consent from parents and participants. Information on sociodemographic profile, anthropometry, diet, personal habits, physical activity, and stress was gathered. Anthropometric measurements were done using standard calibrated instruments, and overweight/obesity was classified based on WHO BMI cut-offs: overweight as $BMI \geq 25$ and obesity as $BMI \geq 30$. Weight and height were measured using standard calibrated instruments. Physical activity was assessed using the International Physical Activity Questionnaire–Short Form (IPAQ-SF), with cut-offs based on the official scoring protocol. Stress was assessed using the Perceived Stress Scale (PSS-10), with interpretation following standard classification: low (0–13), moderate (14–26), and high (27–40) stress. Chi-square test was used to test significance, and $p < 0.05$ was considered significant. Ms Office, Excel and Epi Info 7.2.6.6 were used for statistical analysis.

Ethics: Ethics committee approval was obtained from the Institutional Ethics Committee before commencement of the study.

RESULTS

A total of 400 adolescents residing in the urban field practice area of Osmania Medical College were included in the study. Data were collected using a semi-structured questionnaire to assess sociodemographic characteristics and the prevalence of selected noncommunicable disease (NCD) risk factors.

Sociodemographic Characteristics

Among the study population, 248 (62%) were males and 152 (38%) were females. Participants ranged from 10 to 19 years, with a mean age of 14.47 ± 2.81 years. Most adolescents belonged to the 14–17 age group (40.5%), followed closely by the 10–13 age group (40.3%). The majority were Hindus (80.3%), followed by Muslims (16%) and Christians (3.8%). A significant proportion were unmarried (95.8%), and 88.5% were literate. Regarding family type, 48.3% were from nuclear families, 35.5% from joint families, and 16.3% from three-generation households. Socio-economic status based on the Modified Kuppuswamy classification revealed that nearly half of the participants (47%) were in Class III.

Table 1: Sociodemographic characteristics of study participants (n=400)

Characteristic	N	%
<u>Sex</u>		
Male	248	62.0
Female	152	38.0
<u>Age</u>		
10–13 years	161	40.3
14–17 years	162	40.5
18–19 years	77	19.2
<u>Religion</u>		
Hindu	321	80.2
Muslim	64	16.0
Christian	15	3.8
<u>Marital status</u>		
Unmarried	383	95.8
Married	17	4.2
<u>Type of family</u>		
Nuclear family	193	48.3
Joint family	142	35.5
Three-generation family	65	16.2
<u>Socio-Economic Status (SES)</u>		
Class I (Kuppuswamy)	9	2.2
Class II	63	15.8
Class III	188	47.0
Class IV	119	29.8
Class V	21	5.2

Prevalence of Risk Factors

The most prevalent behavioural risk factor was junk food consumption (61.8%), followed by low physical activity (57.8%) and moderate to high stress levels (63.0%). Passive smoking exposure was reported by 42.3%, while current smoking was noted in 15.8% and alcohol consumption in 6.5%. A family history of NCDs was reported in 31.8% of participants. Excess dietary salt intake was reported by 39%, and 19.8% had a BODY MASS INDEX (BMI) greater than 24.9.

Table 2: Prevalence of risk factors for noncommunicable diseases (n=400)

Risk Factor	N	%
Family history of NCDs	127	31.8
Current smoking	63	15.8
Passive smoking exposure	169	42.3
Alcohol consumption	26	6.5
Junk food consumption	247	61.8
Excess dietary salt intake	156	39.0
Low physical activity	231	57.8
Body Mass Index (BMI) >24.9 (Overweight/Obese)	79	19.8
Moderate to high stress levels	252	63.0

Association Between Risk Factors and Socio-economic Status

Chi-square analysis evaluated associations between socio-economic status and selected risk factors. Body Mass Index (BMI) >24.9 showed a statistically significant association with socio-economic status ($\chi^2=16.11$, $p=0.001$). No significant associations were observed for smoking, alcohol consumption, physical inactivity, or stress levels.

Table 3: Association between risk factors and socio-economic status

Variable	SES	Yes N(%)	No N(%)	Total N (%)	Chi-square (χ^2)	p-value
Smoking	Upper	40 (10%)	220 (55%)	260 (65%)	0.07	0.77
	Lower	23 (5.75%)	117 (29.25%)	140 (35%)		
Alcohol Consumption	Upper	6 (1.5%)	66 (16.5%)	72 (18%)	0.18	0.43
	Lower	20 (5%)	308 (77%)	328 (82%)		
Physical Activity	Upper	43 (10.75%)	29 (7.25%)	72 (18%)	0.05	0.79
	Lower	188 (47%)	140 (35%)	328 (82%)		
Stress	Upper	29 (7.25%)	43 (10.75%)	72 (18%)	0.25	0.59
	Lower	119 (29.75%)	209 (52.25%)	328 (82%)		
BMI	Upper	45 (11.25%)	27 (6.75%)	72 (18%)	16.11	0.001
	Lower	276 (69%)	52 (13%)	328 (82%)		

DISCUSSION

This study examined NCD risk factors in 400 adolescents in an urban field practice area of Hyderabad, with a mean age of 14.47 ± 2.81 years and a higher representation of males (62%). Most participants belonged to the Hindu religion (80.25%) and nuclear families (48.25%), aligning with the findings of Gaiha, Unnikrishnan, and Kulkarni (2024), who also reported Hindu predominance among adolescents (85.72%).

A significant number of participants had exposure to modifiable risk factors: 15.75% were current smokers, and 6.5% consumed alcohol. These findings are consistent with WHO (2017), Pengpid and Peltzer (2019), and WHO (2023). Similarly, Rangel Caballero, Gamboa Delgado, and Murillo López (2017) reported higher tobacco use at 22.61%. Yadav, Kulkarni, and Gaiha (2024) identified 11.9% tobacco use, with smoking more prevalent in rural, unmarried males aged over 15 years.

Notably, passive smoking exposure was alarmingly high (42.25%) (WHO, 2017), suggesting a broader environmental influence from family or community members. The lower alcohol consumption rates compared to prior studies (Mahanta, Mohapatra, Phukan, & Mahanta, 2016; WHO, 2016) might be attributed to cultural norms or underreporting, especially among females.

Alcohol consumption (6.5%) in this study was lower than reported by Mahanta et al. (2016) (12.3%) and WHO (2016) (5.6%), but significantly lower than rates in Raja et al.'s study (54.3% current users). Religious affiliation had no significant association with alcohol use, consistent with Laura (2022), who suggested early religious affiliation may influence future alcohol behaviour.

Fast food consumption was prevalent in 61.75% of adolescents. This is comparable to Al-Mohaimeed and Al-Hazzaa (2015), where 79.1% consumed fast food at least once weekly, and Li et al. (2020), who reported 55.2% weekly consumption.

Physical inactivity was observed in 57.75%, reflecting Ambika (2019), who reported over 80% adolescents being inactive. While this study found no association between Socio-Economic Status (SES) and physical activity, Stalsberg and Pedersen (2010) noted that higher-SES adolescents tend to be more active.

Excess salt consumption (39%) aligns with WHO reports highlighting high sodium intake in India. In 37% of adolescents, stress was reported, though not statistically associated with SES. Stress levels were high but not statistically related to SES, suggesting that psychosocial stressors affect adolescents across all economic backgrounds. This finding diverges from other studies linking low SES with higher stress (Chen, Langer, Raphaelson, & Matthews, 2004; Finkelstein, Kubzansky, Capitman, & Goodman, 2007).

Body Mass Index (BMI) analysis showed 19.75% overweight or obese, with a significant association with SES ($p = .001$), similar to findings by Harish (2016). Family history of NCDs was associated with increased BMI, supporting the results of Downing et al. (2020).

The urban environment itself may play a central role in shaping adolescent behaviour. Unlike rural settings, urban adolescents often experience a faster-paced lifestyle, increased academic burden, and greater exposure to unhealthy food marketing. These contextual differences may explain the higher prevalence of risk factors in urban adolescents, regardless of SES, as seen in this study.

In summary, the findings underscore the need for universal preventive strategies that do not exclusively target low-SES groups but encompass all adolescents in urban environments.

Limitations:

The cross-sectional study limited the ability to establish causal relationships between risk factors and outcomes. Data on lifestyle behaviours were self-reported, which may introduce recall bias or underreporting, particularly for sensitive behaviours like smoking or alcohol use.

CONCLUSION

This study highlights a substantial burden of noncommunicable disease (NCD) risk factors among adolescents in an urban setting, with high prevalence of modifiable behaviours such as junk food consumption, low physical activity, and elevated stress levels. Notably, 19.8% of participants were overweight or obese. Body Mass Index (BMI) >24.9) was significantly associated with socio-economic status. The findings underscore the urgent need for early interventions targeting adolescents' lifestyle and behavioural risk factors to prevent long-term health consequences related to NCDs. Schools should integrate regular health education and structured physical activity programs, while parents must model healthy behaviours and limit unhealthy food exposure at home. Policymakers can prioritize adolescent health by enforcing nutrition standards in school canteens and allocating resources for adolescent-friendly health promotion initiatives. Future research should explore longitudinal trends and develop context-specific surveillance systems to monitor NCD risk profiles in adolescents over time.

We recommend **that** school-based health education programs focusing on healthy lifestyle habits, including nutrition, physical activity, and stress management, be implemented at the community level. Regular screening and monitoring of adolescents for NCD risk factors should be integrated into primary healthcare services to enable early detection and timely intervention.

Conflict of interest

The authors declare that they have no conflicts of interest.

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