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Prevalence and Correlates of Non-Communicable Diseases Among Young Populations: A Community-Based Cross-Sectional Study

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ABSTRACT

Background: Since non-communicable diseases (NCDs) account for more than 70% of fatalities worldwide, they have grown to be a serious public health concern. NCDs have historically been linked to elderly populations, but they are becoming more commonly impacting younger age groups, especially in low- and middle-income nations like India. The study aims to assess the prevalence of NCDs and their related risk factors among the young population.

Methods: A study was conducted over six months, involving 500 participants aged 15-30 years. Participants were selected through multistage random sampling, and data were collected via structured interviews and clinical assessments. The primary outcome was the presence of NCDs, including hypertension, diabetes, cardiovascular diseases, and respiratory disorders. Statistical analysis involved bivariate and multivariate logistic regression to explore associations between NCDs and demographic, socioeconomic, and lifestyle factors.

Results: The study found that 32% of participants had at least one NCD. Hypertension was the most prevalent (18%), followed by diabetes (10%) and cardiovascular diseases (6%). Significant associations were observed between NCD prevalence and factors such as advancing age, low physical activity, smoking, alcohol consumption, and high body mass index. Multivariate analysis revealed that smoking (OR = 3.10, $p < 0.001$), low physical activity (OR

= 2.80, $p < 0.001$), and being obese (OR = 2.20, $p < 0.001$) were independent predictors of NCDs.

Conclusion: The study highlights a substantial burden of NCDs among the young population in Darbhanga, driven primarily by modifiable lifestyle factors. Urgent public health interventions are needed to promote healthier lifestyles, particularly focusing on reducing smoking, increasing physical activity, and managing weight.

Recommendations: Preventive strategies should be implemented in schools and communities to educate young people about the risks related with NCDs. Early intervention programs targeting lifestyle changes, particularly in rural and low-income areas, are essential to reduce the future burden of NCDs.

Keywords: Non-Communicable Diseases, Young Population, Lifestyle Factors, Prevalence, Hypertension.

INTRODUCTION

Non-communicable diseases (NCDs) have become a major global health concern, accounting for more than 70% of all deaths worldwide each year. Chronic respiratory disorders, diabetes, cancer, and cardiovascular diseases have historically been linked to older populations, but they are also becoming more common in younger age groups, especially in teenagers and young people [1]. Concerns about this trend are becoming more and more pressing because of the long-term health effects and financial toll that NCDs have on people and health systems around the globe. The World Health Organisation (WHO) reports that among people aged 10 to 24, NCDs now account for a greater portion of the disease burden. In this age range, mental health disorders, accidents, and cardiovascular ailments are among the main causes of death and disability [1, 2].

Several risk factors, including as poor diets, physical inactivity, tobacco use, and problematic alcohol use, are contributing to the increased prevalence of NCDs among younger populations in low- and middle-income countries like India [3]. These behavioral patterns often develop during adolescence and persist into adulthood, contributing to the early onset of NCDs. Studies indicate that in some regions, up to 25% of youth are affected by at least one NCD-related risk factor such as obesity or smoking, which significantly increases their risk of developing NCDs

later in life [4]. This shift is particularly alarming in countries like India, where rapid urbanization and lifestyle changes have accelerated the rise in NCD prevalence among the youth.

The socioeconomic and environmental determinants of NCDs also play a critical role. A person's encounter with NCD risk factors is significantly influenced by characteristics like socioeconomic position, healthcare access, and educational attainment. The burden of NCDs is increased, for example, when adolescents from poorer socioeconomic circumstances are more likely to participate in high-risk behaviours like tobacco use and have less access to preventative healthcare services [5]. Moreover, the COVID-19 pandemic has further highlighted the vulnerability of individuals with NCDs, as they are more susceptible to severe outcomes, underscoring the need for robust public health interventions targeting young populations.

The study aims to assess the prevalence of NCDs and their associated risk factors among the young population.

METHODOLOGY

Study Design

A cross-sectional community-based study.

Study Setting

The study took place over a six-month period in both urban and rural areas of Darbhanga, utilizing a combination of household visits and community health center screenings. The cross-sectional design enabled the researchers to collect data at a single point in time, offering insights into the burden of NCDs within this age group and the associated risk factors.

Participants

A total of 500 participants, aged between 15 and 30 years, were recruited for the study. Participants were selected using a multistage random sampling technique to ensure that they were representative of the population in the region.

Inclusion criteria

Participants in the study had to be long-term residents of Darbhanga, having settled down there for at least a year. Enrolment was restricted to individuals who gave their informed consent.

Exclusion criteria

Exclusion criteria included individuals with any diagnosed communicable diseases and pregnant women, as pregnancy could introduce health conditions unrelated to the focus of the study. Additionally, individuals with incomplete or inconsistent data were excluded to maintain the reliability of the findings.

Bias

Efforts were made to minimize potential biases throughout the study. A random sampling method was employed to reduce selection bias, ensuring a diverse and representative sample of the population. Data collectors were thoroughly trained, and standardized procedures were followed during data collection and physical assessments to prevent measurement bias. The data collection tool—a structured questionnaire—was pre-tested to ensure clarity and reliability. Any necessary adjustments were made following the pilot testing to address potential recall or reporting biases from participants.

Variables

The study investigated variable such as the presence of NCDs, including diabetes, hypertension, cardiovascular diseases, and respiratory conditions, age, gender, and socio-economic status, as well as lifestyle factors like alcohol consumption, smoking, physical activity, and diet.

Data Collection and Procedure

Data collection involved a combination of interviews and clinical assessments. Trained data collectors visited participants' homes or community centers to conduct face-to-face interviews using a structured questionnaire. The questionnaire captured data on demographic characteristics, lifestyle behaviors, family medical history, and other potential correlates of NCDs. Additionally, participants underwent physical and clinical assessments, which included the measurement of BMI, blood pressure, and blood glucose levels. These assessments were conducted using standardized equipment and protocols to ensure consistency and accuracy.

Statistical Analysis

SPSS 25 was used for statistical analysis. Descriptive statistics showed as averages and standard deviations, frequencies and percentages. We used bivariate analysis to examine connections between independent factors and NCD prevalence. These analyses used t-tests and Chi-square. Multivariate logistic regression models showed independent NCD correlations while controlling for confounding variables. p-values below 0.05 were statistically significant.

Ethical considerations

The study protocol was approved by the Ethics Committee and written informed consent was received from all the participants.

RESULTS

The study comprised 500 participants aged between 15 and 30 years. The mean age was 22.5 years (SD ± 4.2), with 52% of the sample being female and 48% male. The majority of the participants (62%) resided in rural areas, while the remaining 38% were from urban areas. Regarding educational status, 60% of the participants had completed secondary education, 25% had only primary education, and 15% had tertiary education. Most participants (65%) belonged to middle-income households, with 25% from low-income and 10% from high-income groups (Table 1).

Table 1: Demographic Characteristics

Demographic Variables	Frequency (n)	Percentage (%)
Age (Years)		
15–19	180	36%
20–25	200	40%
26–30	120	24%
Gender		
Male	240	48%
Female	260	52%
Residence		
Urban	190	38%
Rural	310	62%

Educational Status		
Primary Education	125	25%
Secondary Education	300	60%
Tertiary Education	75	15%
Household Income		
Low-Income	125	25%
Middle-Income	325	65%
High-Income	50	10%

Out of the 500 participants, 160 individuals (32%) were found to have at least one non-communicable disease. Hypertension was the most prevalent NCD, affecting 18% of the population, followed by diabetes at 10%, cardiovascular diseases at 6%, and respiratory disorders (e.g., asthma, chronic bronchitis) at 5%. Of the 160 individuals with NCDs, 45% were males and 55% were females. Rural participants exhibited a higher prevalence of NCDs (35%) compared to urban participants (28%). The prevalence of NCDs among the participants is shown in Table 2.

Table 2: Prevalence of NCDs

Non-Communicable Diseases	**Frequency (n)**	**Percentage (%)**
Total with NCDs	160	32%
Hypertension	90	18%
Diabetes	50	10%
Cardiovascular Diseases	30	6%
Respiratory Disorders	25	5%

Age and NCD Prevalence

There was a clear association between age and the prevalence of NCDs. Among participants aged 26–30 years, 45% had an NCD, compared to 30% among those aged 20–25 years, and 20% among those aged 15–19 years. The Chi-square test indicated a statistically significant correlation between age and the presence of NCDs ($\chi^2 = 16.52$, $p < 0.001$).

Gender and NCD Prevalence

Females had a slightly higher prevalence of NCDs (34%) compared to males (30%), although the variation was not statistically significant ($\chi^2 = 1.45$, $p = 0.23$).

Socioeconomic Status and NCDs

Participants from low-income households had the highest prevalence of NCDs (42%), followed by middle-income households (30%), and high-income households (20%). A statistically significant correlation was found between socioeconomic status and NCD prevalence ($\chi^2 = 12.48$, $p < 0.01$).

Associations between NCD prevalence and demographic factors are presented in Table 3.

Table 3: Association Between Demographic Factors and NCD Prevalence

Risk Factor	**Prevalence of NCDs (%)**	**p-value**
Age Group		
15–19	20%	< 0.001
20–25	30%	
26–30	45%	
Gender		
Male	30%	0.23
Female	34%	
Socioeconomic Status		
Low-Income	42%	< 0.01
Middle-Income	30%	
High-Income	20%	

Physical Activity

Participants who reported low levels of physical activity had a significantly higher prevalence of NCDs (40%) compared to those who engaged in regular physical activity (20%). This association was statistically significant ($\chi^2 = 18.65$, $p < 0.001$).

Smoking and Alcohol Consumption

Among the participants, 25% were smokers, and 15% reported regular alcohol consumption. The prevalence of NCDs was significantly higher among smokers (50%) compared to non-

smokers (25%), and similarly, individuals who consumed alcohol had a higher prevalence of NCDs (45%) compared to non-drinkers (30%). Both smoking ($\chi^2 = 21.15$, $p < 0.001$) and alcohol consumption ($\chi^2 = 13.72$, $p < 0.01$) were significantly associated with NCDs.

Body Mass Index (BMI)

A higher prevalence of NCDs was observed among participants with a BMI in the overweight or obese category. Of the 110 participants classified as overweight or obese, 45% had an NCD, compared to 25% in those with a normal BMI. The association between BMI and NCDs was statistically significant ($\chi^2 = 14.55$, $p < 0.001$).

Associations between lifestyle factors and NCD prevalence are detailed in Table 4.

Table 4: Association Between Lifestyle Factors and NCD Prevalence

Lifestyle Factors	**Prevalence of NCDs (%)**	**p-value**
Physical Activity		
Low Physical Activity	40%	< 0.001
Regular Physical Activity	20%	
Smoking		
Smokers	50%	< 0.001
Non-Smokers	25%	
Alcohol Consumption		
Drinkers	45%	< 0.01
Non-Drinkers	30%	
BMI Category		
Normal BMI	25%	< 0.001
Overweight/Obese	45%	

Multivariate logistic regression identified NCD independent correlates. Even after correcting for relevant covariates, age, inadequate physical activity, smoking, and overweight or obesity were highly associated with NCDs. For participants aged 26–30, the risk of NCD was 2.5 times higher than for those aged 15–19. Smoking increased NCD risks by 3.1 times, while inactivity increased them by 2.8 times. Overweight and obese participants had 2.2 times the NCD risk (Table 5).

Table 5: Multivariate Logistic Regression Analysis of Factors Associated with NCDs

Variable	Odds Ratio (OR)	95% CI	p-value
Age (26–30 years vs. 15–19)	2.50	1.45–4.30	< 0.01
Smoking	3.10	1.85–5.20	< 0.001
Low Physical Activity	2.80	1.75–4.45	< 0.001
Overweight/Obese (vs. Normal)	2.20	1.50–3.90	< 0.001

DISCUSSION

The study found that 32% of the young population in Darbhanga, Bihar, were affected by at least one NCD. Hypertension emerged as the most prevalent NCD, affecting 18% of the participants, followed by diabetes (10%), cardiovascular diseases (6%), and respiratory disorders (5%). The relatively high prevalence of NCDs in this young age group is concerning, especially given that NCDs are traditionally associated with older populations. This highlights an emerging public health challenge, signaling the need for early detection and prevention strategies targeting younger populations to curb the rising burden of NCDs.

The analysis revealed a significant correlation between age and the prevalence of NCDs, with the oldest age group (26–30 years) showing the highest prevalence (45%). This suggests that even within a relatively young population, advancing age increases the likelihood of developing NCDs. Gender differences were not statistically significant, though females had a slightly higher prevalence (34%) compared to males (30%).

Socioeconomic status was significantly associated with NCD prevalence, with lower-income groups showing higher rates of NCDs (42%) compared to middle-income (30%) and high-income (20%) groups. This suggests that individuals from lower socioeconomic backgrounds may face more risk factors, such as poor diet, lack of access to healthcare, or higher stress levels, making them more vulnerable to NCDs.

Lifestyle factors played a crucial role in the prevalence of NCDs among the participants. Low physical activity was strongly associated with higher NCD prevalence (40%), compared to those who were more physically active (20%). This finding underscores the importance of promoting physical activity as a key preventive measure against NCDs.

Similarly, smoking and alcohol consumption were substantially correlated with a higher risk of NCDs. Smokers had a 50% prevalence of NCDs compared to 25% among non-smokers, while participants who consumed alcohol had a 45% NCD prevalence compared to 30% among non-drinkers. These findings point to the detrimental effects of unhealthy habits, reinforcing the need for public health interventions that focus on reducing smoking and alcohol consumption, especially among younger populations.

Body mass index (BMI) was another significant factor. Participants who were classified as overweight or obese had a substantially higher prevalence of NCDs (45%) compared to those with normal BMI (25%). This aligns with global evidence linking obesity to a higher risk of conditions such as hypertension, diabetes, and cardiovascular diseases.

The multivariate logistic regression study found many independent noncommunicable disease risk variables. Age (26–30), smoking, inactivity, and obesity were highly connected to non-communicable disease risk. Smokers had a 3.1-fold higher risk of NCD than non-smokers, while people between 26 and 30 had a 2.5-fold higher risk than those between 15 and 19. The analysis further confirmed that low physical activity and higher BMI are critical contributors to the development of NCDs, emphasizing the need for interventions that address both individual behaviors and broader environmental factors.

The study highlights an alarming prevalence of NCDs among the young population in Darbhanga, driven by lifestyle and socioeconomic factors. The associations between age, physical inactivity, smoking, alcohol consumption, and high BMI with NCDs underscore the importance of promoting healthier lifestyles, especially in younger populations. The findings suggest that public health programs should focus on creating awareness about the dangers of smoking, alcohol consumption, physical inactivity, and unhealthy eating patterns. Early intervention strategies, particularly in lower socioeconomic groups, are essential to prevent the rising tide of NCDs and reduce long-term health care burdens.

According to a global survey involving 304,779 teenagers from 89 different countries, more than 82% of teenagers had two or more risk factors for NCDs, and 34.9% had three or more. The most common risk factors were low consumption of fruits and vegetables and physical inactivity, which showed a noticeable clustering of these factors in both genders. Over 40% of the teenagers also reported co-occurring conditions of alcohol use, smoking, physical

inactivity, and inadequate intake of fruits and vegetables. This underscores the need for gender-specific preventative efforts [6].

In Bangladesh, a study of 9,569 adolescents showed similarly high prevalence rates of NCD risk factors, particularly insufficient fruit and vegetable intake (93.6% among girls and 90.8% among boys) and inadequate physical activity (51.9% among girls and 33.4% among boys). Additionally, the co-presence of multiple risk factors was more common among girls, with 48.8% of them having two or more risk factors. This study highlighted socioeconomic factors such as the area of residence and parental occupation as key contributors to NCD risk [7].

In a comprehensive study from India, the prevalence of physical inactivity among adolescents aged 15-17 years was 25.2%, with tobacco use at 3.1% and overweight and obesity at 8%. The study underscores the importance of health education, as two-thirds of the adolescents had received education on NCD risk factors in schools [8].

A similar study in Nepal found that nearly 83% of adolescents had two or more NCD risk factors, with physical inactivity and insufficient fruit and vegetable consumption being the most common. The study highlighted the socio-demographic clustering of risk factors, showing that older adolescents and those from urban settings were at higher risk [9].

Adolescents in four Caribbean countries participated in a study that found disturbingly high rates of physical inactivity (84.2%) and inadequate intake of fruits and vegetables (82.2%). Each adolescent had an average of 3.6 NCD risk factors, with the possibility of having multiple risk factors increasing with age and psychological distress. One protective element that helped to lower the number of risk variables was parental support [10].

In South Africa, adolescents living with HIV were found to have an elevated risk of NCDs compared to their peers. This study showed that 37% had central obesity, while 5% had hypertension. High levels of food insecurity and poor dietary habits were common, underlining the need for integrated screening of NCDs in HIV care programs [11].

In Indonesia, 87.8% of adolescents were found to have low physical activity, while 76.8% had insufficient fruit and vegetable intake. About 46.5% of the adolescents had three or more risk factors, highlighting the role of age, gender, and psychological distress in increasing the likelihood of multiple NCD risk factors [12].

In Nepal, a STEPS survey conducted in 2019 revealed that 97% of the population consumed fewer than five servings of fruits and vegetables daily, with 17% being current smokers and 7.4% having low physical activity. The study indicated that older participants and those from wealthier households were at higher risk for overweight, raised blood pressure, and raised cholesterol [13].

Lastly, a study in Kerala, India, found that 72.6% of women and 39.1% of men had abdominal obesity, while the overall prevalence of hypertension was 30.4%. Tobacco use among men was 20.3%, and alcohol consumption was 28.9%. The findings call for primary and secondary prevention strategies to address the high rates of NCD risk factors [14].

CONCLUSION

The findings indicate that the prevalence of NCDs among the young population in Darbhanga is 32%, with hypertension being the most common. Key risk factors for NCDs include advancing age, low physical activity, smoking, alcohol consumption, and high BMI. These results highlight the need for targeted interventions focusing on lifestyle modification and preventive measures to reduce the burden of NCDs in this population.

Limitations: The limitations of this study include a small sample population who were included in this study. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

Recommendation: Preventive strategies should be implemented in schools and communities to educate young people about the risks related with NCDs. Early intervention programs targeting lifestyle changes, particularly in rural and low-income areas, are essential to reduce the future burden of NCDs.

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List of abbreviations:

NCDs – Non-Communicable Diseases

WHO – World Health Organization

BMI – Body Mass Index

SPSS – Statistical Package for the Social Sciences

OR – Odds Ratio

CI – Confidence Interval

SD – Standard Deviation

χ^2 – Chi-square Test

COVID-19 – Coronavirus Disease 2019

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