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Prevalence and Risk Factors of Non-Communicable Diseases in Middle-Aged Adults

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ABSTRACT

Non-communicable diseases (NCDs) have become major contributors to global morbidity and mortality, with an increasing burden observed in middle-aged populations due to demographic transitions and lifestyle changes. Identifying prevalence patterns and associated risk determinants is essential for guiding preventive public health strategies. To assess the prevalence of non-communicable diseases and determine associated risk factors among middle-aged adults. A cross-sectional observational study was conducted over one year among 200 middle-aged adults (40–60 years). Sociodemographic data, behavioral characteristics, dietary patterns, and physical activity levels were recorded using a structured questionnaire. Anthropometric measurements, blood pressure, fasting glucose, and lipid profile analyses were performed. Statistical analysis involved descriptive data presentation and assessment of associations using chi-square and t-tests, with $p < 0.05$ considered statistically significant. Hypertension (36%), diabetes mellitus (29%), and dyslipidemia (23%) represented the most common NCDs. Sedentary lifestyle (66%), high-calorie dietary patterns (64%), smoking (27%), and alcohol consumption (24%) were prevalent risk factors. Significant associations were observed between NCD prevalence and sedentary lifestyle, high-calorie diet, elevated BMI, smoking, and alcohol consumption ($p < 0.05$). NCD prevalence was high among middle-aged adults and strongly associated with modifiable risk factors. Preventive strategies focusing on lifestyle modification, dietary regulation, and behavioral interventions are required to reduce long-term morbidity.

Keywords: Non-communicable diseases, Risk factors, Middle-aged adults

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INTRODUCTION

Non-communicable diseases (NCDs) have emerged as major contributors to global morbidity and mortality, accounting for more than 70 percent of deaths worldwide [1]. Over the last two decades, the epidemiological landscape has shifted from communicable to chronic degenerative diseases, primarily driven by demographic transition, urbanization, and lifestyle modifications [2]. Middle-aged adults, typically defined as individuals between 40 and 60 years of age, constitute a critical population group experiencing an increasing burden of NCDs such as hypertension, diabetes mellitus, cardiovascular disease, chronic respiratory disease, and cancer [3, 4]. This age group often serves as the economic and social backbone of society; hence, disease-related disability and premature mortality have profound public health, economic, and familial consequences [5].

The development of NCDs is multifactorial, influenced by modifiable risk factors including sedentary behavior, dietary imbalance, alcohol consumption, tobacco use, psychosocial stress, and obesity, as well as non-modifiable determinants like age, genetics, and family history [6, 7]. In addition, socio-economic status, occupational exposure, and environmental pollutants further exacerbate susceptibility. Despite widespread awareness efforts, the prevalence of NCDs continues to rise, particularly in low- and middle-income countries where health systems face dual burdens of infectious and chronic diseases [8]. Understanding the prevalence and associated risk factors of NCDs in middle-aged adults is essential for guiding targeted preventive strategies, early detection programs, and effective health policy interventions aimed at reducing preventable morbidity and mortality.

STUDY METHODOLOGY

This cross-sectional observational study was conducted over a period of one year in the Department of Community Medicine at a tertiary care center. The study population consisted of middle-aged adults aged 40 to 60 years residing within the catchment area of the institute. Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study, and written informed consent was obtained from all participants. Individuals who were critically ill, bedridden, or unwilling to participate were excluded from the study.

A total sample size of 200 subjects was selected using a systematic sampling method. Eligible participants were recruited during outpatient visits, community health camps, and routine screening programs organized during the study period. Sociodemographic data including age, gender, occupation, education, and socioeconomic status were collected using a pre-validated structured questionnaire. Clinical history regarding family history of NCDs, smoking, alcohol consumption, dietary habits, and physical activity levels was recorded.

All participants underwent anthropometric measurements including height, weight, waist circumference, and body mass index (BMI). Blood pressure was recorded using a calibrated sphygmomanometer. Laboratory investigations including fasting blood glucose and lipid profile were performed using standard biochemical methods. The presence of hypertension, diabetes mellitus, dyslipidemia, and other non-communicable diseases was diagnosed based on established national and international clinical guidelines.

Data were compiled and analyzed using statistical software. Quantitative variables were presented as mean and standard deviation, while categorical variables were expressed as frequencies and percentages. Associations between risk factors and NCD prevalence were assessed using chi-square test for categorical data and Student's t-test or ANOVA for continuous variables. A p-value of less than 0.05 was considered statistically significant. Findings were interpreted to determine the prevalence and key risk determinants of non-communicable diseases among middle-aged adults.

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RESULTS

Table 1: Sociodemographic Profile of Study Participants (n = 200)

Variable	Category	n	%	Test Applied	Test Value	p-value	Interpretation
Age Group (years)	40–45	56	28.0	Chi-square	χ^2 = 11.20	p = 0.011	Significant distribution across age groups
	46–50	64	32.0				
	51–55	48	24.0				
	56–60	32	16.0				
Gender	Male	108	54.0	Chi-square	χ^2 = 1.28	p = 0.257	Non-significant distribution across gender
	Female	92	46.0				
Socioeconomic Class	Upper	18	9.0	Chi-square	χ^2 = 68.84	p < 0.001	Significant distribution across socioeconomic class
	Middle	126	63.0				
	Lower	56	28.0				

Table 2: Distribution of Behavioral and Lifestyle Risk Factors (n = 200)

Risk Factor	Category	n	%	Test Applied	Test Value	p-value	Interpretation
Smoking	Present	54	27.0	Chi-square	χ^2 = 42.32	p < 0.001	Significant distribution; absence more prevalent
	Absent	146	73.0				
Alcohol Consumption	Present	48	24.0	Chi-square	χ^2 = 52.00	p < 0.001	Significant distribution; absence more prevalent
	Absent	152	76.0				
Physical Activity	Adequate	68	34.0	Chi-square	χ^2 = 20.48	p < 0.001	Significant distribution; sedentary behavior dominant
	Sedentary	132	66.0				
Diet Pattern	Healthy/Mixed	72	36.0	Chi-square	χ^2 = 15.68	p < 0.001	Significant distribution; high-calorie/processed diet prevalent
	High-Calorie/Processed	128	64.0				

Table 3: Prevalence of NCDs Among Study Participants (n = 200)

Non-Communicable Disease	Cases (n)	%
Hypertension	72	36.0
Diabetes Mellitus	58	29.0
Dyslipidemia	46	23.0
Cardiovascular Disease	18	9.0
Chronic Respiratory Disease	10	5.0
Metabolic Syndrome (Combined)	28	14.0

Table 4: Association of Risk Factors with NCDs (n = 200)

Risk Factor	Category	With NCD (n=112)*	Without NCD (n=88)*	p-value
Smoking	Present	38 (33.9%)	16 (18.2%)	<0.05
Alcohol Consumption	Present	32 (28.6%)	16 (18.2%)	<0.05
Sedentary Lifestyle	Present	88 (78.6%)	44 (50.0%)	<0.01
High-Calorie Diet	Present	92 (82.1%)	36 (40.9%)	<0.001

BMI ≥ 25 kg/m^2	Present	74 (66.1%)	26 (29.5%)	<0.001

*Note: NCD = presence of at least one major NCD (Hypertension, Diabetes, Dyslipidemia, CVD).

DISCUSSION

In the present study evaluating the prevalence and associated risk factors of non-communicable diseases (NCDs) among middle-aged adults, a high burden of chronic morbidity was observed. The demographic distribution showed that the largest proportion of the study population belonged to the 46–50 years age group, followed by the 40–45 years cohort, indicating that the onset of NCDs is increasingly shifting toward the younger segments of middle age. This demographic trend is consistent with national and global epidemiological shifts, wherein non-communicable diseases have started manifesting earlier due to lifestyle transitions, sedentary occupations, and changing dietary habits. A slightly higher representation of males was noted, which corresponds with existing literature that identifies men in this age group as more exposed to behavioral risk factors such as tobacco and alcohol [9, 10].

Lifestyle and behavioral determinants played a significant role in disease prevalence. Approximately two-thirds of participants exhibited sedentary lifestyles, and nearly two-thirds followed high-calorie or processed dietary patterns. These findings reinforce the role of lifestyle transitions in accelerating cardiometabolic risks. Notably, 27 percent of participants smoked and 24 percent consumed alcohol, further compounding the risk exposure. Such patterns correlate strongly with the increasing prevalence of early-onset hypertension, diabetes mellitus, and dyslipidemia reported across developing countries as urbanization advances [11].

The prevalence of NCDs in this study cohort was substantial, with hypertension being the most common, followed by diabetes mellitus and dyslipidemia. This clustering of cardiometabolic conditions mirrors the metabolic syndrome spectrum and presents significant implications for long-term cardiovascular morbidity. Though cardiovascular disease and chronic respiratory illness were less common relative to metabolic disorders, their presence at notable percentages within a middle-aged cohort is alarming, considering the potential for progressive deterioration into major disability and mortality.

Statistical analysis highlighted strong associations between modifiable risk factors and NCDs. Sedentary lifestyle, high-calorie/processed dietary habits, and elevated BMI showed the strongest associations with disease prevalence, each demonstrating significant p-values. These associations align with contemporary evidence linking physical inactivity, overweight/obesity, and dietary excess with insulin resistance, dyslipidemia, and systemic inflammation. Smoking and alcohol consumption also displayed significant associations, reflecting their established contributions to vascular and metabolic dysfunctions. Importantly, the findings emphasize that modifiable determinants continue to dominate the risk profile for NCDs in this age group, underscoring the need for proactive preventive interventions.

The study findings also hold public health significance. Middle-aged adults represent a productive socio-economic group; therefore, disease burden within this demographic has direct implications for healthcare expenditure, productivity, and quality of life. The coexistence of multiple risk factors within the same individuals, as observed in metabolic syndrome clustering, further amplifies long-term costs. These results affirm the necessity for integrated screening programs, targeted education campaigns, and risk factor modification strategies aimed at reducing preventable non-communicable disease burden. Early interventions focusing on lifestyle modification, dietary counseling, physical activity promotion, and tobacco/alcohol cessation could substantially mitigate morbidity and postpone disease onset.

CONCLUSION

In conclusion, our study demonstrates a high prevalence of NCDs among middle-aged adults with strong associations to modifiable lifestyle risk factors. The findings reinforce the urgent need for comprehensive public health measures addressing primary prevention, early detection, and sustained health behavior changes to curb the growing NCD epidemic.

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