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A Community-Based Study to Assess Non-Communicable Disease Risk Factors and Health-Seeking Behaviour Among Adults of Rural Population of North India

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KEYWORDS

Non-communicable diseases; Risk factors; Health-seeking behaviour; Rural population; WHO STEPS; India

ABSTRACT:

Background: Non-communicable diseases (NCDs are a growing public health concern in India, with an increasing burden in rural populations due to lifestyle changes, limited awareness, and inadequate access to healthcare services. Understanding NCD risk factors and health-seeking behaviour is essential for effective prevention and control strategies.

Objectives: To assess the prevalence of non-communicable disease risk factors and to evaluate health-seeking behaviour among adults in a rural population of North India.

Materials and Methods: A community-based cross-sectional study was conducted from June 2024 to June 2025 in the rural field practice area of Integral Institute of Medical Sciences and Research, North India. A total of 657 adults aged ≥18 years or older were selected using simple random sampling through a house-to-house survey. Data were collected using a pre-tested semi-structured questionnaire adapted from the WHO STEPS approach. Anthropometric measurements and blood pressure were recorded using standard procedures. Data were analysed using SPSS version 26. Descriptive statistics were used, and associations were tested using the Chi-square test, with $p<0.05$ considered statistically significant.

Results: The prevalence of current tobacco use and alcohol consumption was 37.0% and 29.8%, respectively. Nearly half of the participants (48.4%) were physically inactive, and 65.0% reported inadequate fruit and vegetable intake. Overweight and obesity were observed in 46.6% of participants. Hypertension and known diabetes mellitus were present in 33.2% and 18.4% of participants, respectively. Regular health check-ups were reported by only 32.6% of participants, and 38.6% of known NCD cases showed irregular treatment adherence. Poor health-seeking behaviour was significantly associated with tobacco use, alcohol consumption, physical inactivity, and hypertension ($p<0.05$).

Conclusion: The study reveals a high burden of NCD risk factors and suboptimal health-seeking behaviour among adults in a rural population of North India. Strengthening primary healthcare services, promoting lifestyle modification, and improving community awareness are essential to curb the rising burden of NCDs in rural areas.

INTRODUCTION

Non-communicable diseases (NCDs) have emerged as a major public health challenge worldwide, accounting for nearly 74% of global deaths annually [1]. Cardiovascular diseases, diabetes mellitus, chronic respiratory diseases, and cancers constitute the major

Journal of Chemical Health Risks

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share of this burden. Low- and middle-income countries, including India, contribute disproportionately to NCD-related morbidity and mortality, owing to rapid urbanisation, demographic transition, lifestyle changes, and limited access to preventive healthcare services [2].

India is currently undergoing an epidemiological transition characterised by a rising burden of NCDs alongside persisting communicable diseases [3]. According to the Global Burden of Disease study, NCDs account for more than 60% of total deaths in India, with cardiovascular diseases being the leading cause [4]. Behavioural risk factors such as tobacco use, harmful alcohol consumption, physical inactivity, and unhealthy dietary habits are well-established contributors to the development of NCDs and are increasingly prevalent across both urban and rural populations [5].

Traditionally, NCDs were considered diseases of urban and affluent populations; however, recent evidence suggests a rapidly increasing prevalence in rural areas of India [6]. Rural populations are particularly vulnerable due to lower literacy levels, lack of awareness, socioeconomic constraints, and limited access to healthcare facilities [7]. Furthermore, early detection and management of NCDs remain suboptimal in rural settings, leading to delayed diagnosis and increased complications.

Health-seeking behaviour plays a crucial role in the prevention, early diagnosis, and management of NCDs. It refers to the actions taken by individuals to recognize health problems and seek appropriate care [8]. Factors influencing health-seeking behaviour include socio-demographic characteristics, cultural beliefs, accessibility of healthcare services, perceived severity of illness, and financial constraints [9]. Poor health-seeking behaviour can lead to inadequate treatment adherence, delayed care, and poor health outcomes, especially among individuals with chronic diseases [10].

The World Health Organisation (WHO) has emphasised the importance of community-based surveillance of NCD risk factors through the STEPwise approach to Surveillance (STEPS), particularly in resource-limited settings [11]. Assessing behavioural and biological risk factors along with health-seeking behaviour at the community level is essential for designing targeted interventions and strengthening primary healthcare services.

Despite the growing burden of NCDs, data on NCD risk factors and health-seeking behaviour in rural populations of North India remain limited. Understanding these patterns is vital for planning effective preventive strategies and improving healthcare delivery at the grassroots level. Therefore, the present study was undertaken to assess the prevalence of NCD risk factors and health-seeking behaviour among adults residing in a rural population of North India.

MATERIALS AND METHODS

Study Design

This was a community-based cross-sectional observational study conducted to assess non-communicable disease (NCD) risk factors and health-seeking behaviour among adults residing in a rural area of North India.

Study Setting

The study was conducted in the rural field practice area affiliated with the Integral Institute of Medical Sciences and Research, located in North India. The region predominantly comprises agrarian households with limited access to tertiary healthcare facilities.

Study Duration

The study was conducted over a period of one year, from June 2024 to June 2025.

Study Population

The study population included adult residents (≥18 years) of the selected rural area.

Sample Size

A total of 657 participants were included in the study. The sample size was calculated based on the expected prevalence of key NCD risk factors from previous studies, with a 95% confidence level and an allowable error of 5%. The final sample size was adjusted to account for non-response and feasibility during the study period.

Sampling Technique

A house-to-house survey was conducted in the study area. Eligible households were selected using simple

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(1), 607-613 | ISSN:2251-6727

random sampling. From each selected household, one eligible adult was chosen randomly after obtaining written informed consent.

Inclusion Criteria

- Adults aged 18 years and above
- Permanent residents of the study area (residing for ≥6 months)
- Individuals who provided written informed consent

Exclusion Criteria

- Pregnant women
- Severely ill individuals or those unable to respond to the questionnaire
- Individuals unwilling to participate

Data Collection Tool

Data were collected using a pre-designed, pre-tested semi-structured questionnaire, adapted from the WHO STEPwise Approach to Surveillance (STEPS) for NCD risk factors. The questionnaire included the following sections:

- Socio-demographic details
- Behavioural risk factors (tobacco use, alcohol consumption, physical activity, dietary habits)
- Personal and family history of NCDs (hypertension, diabetes mellitus, cardiovascular diseases)
- Health-seeking behaviour (healthcare utilisation, treatment adherence, and preference for healthcare facilities)

Operational Definitions

- Current tobacco user: A person who used any form of tobacco within the past 30 days
- Current alcohol user: Consumption of alcohol at least once in the past 30 days
- Physically inactive: Engaging in less than 150 minutes of moderate-intensity physical activity per week
- Health-seeking behaviour: Actions undertaken by individuals to maintain health, prevent illness, or seek treatment for perceived illness

Anthropometric and Clinical Measurements

- Height and weight were measured using standard techniques, and Body Mass Index (BMI) was calculated.
- Blood pressure was measured using a calibrated digital sphygmomanometer. Two readings were taken five minutes apart, and the average value was recorded.
- Hypertension was classified according to JNC-8 guidelines.

Data Collection Procedure

Data were collected through face-to-face interviews conducted by trained investigators during household visits. Privacy, confidentiality, and cultural sensitivity were maintained throughout the data collection process.

Ethical Considerations

The study was conducted after obtaining approval from the Institutional Ethics Committee of Integral Institute of Medical Sciences and Research. Written informed consent was obtained from all participants beforeenrollment. Confidentiality of participant information was strictly maintained.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using SPSS software (version 26).

- Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarise the data.
- Associations between NCD risk factors and health-seeking behaviour were analysed using the Chi-square test, with a p-value <0.05 considered statistically significant.

RESULTS AND OBSERVATIONS

A total of 657 adults from the rural study area participated in the study. The results are presented under the following headings.

Journal of Chemical Health Risks

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JCHR (2026) 16(1), 607-613 | ISSN:2251-6727

Table 1: Socio-Demographic Characteristics of Study Participants (n = 657)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	18–30	158	24.0
	31–45	221	33.6
	46–60	187	28.5
	>60	91	13.9
Gender	Male	356	54.2
	Female	301	45.8
Marital status	Married	512	77.9
	Unmarried/Widowed	145	22.1
Education status	Illiterate	198	30.1
	Primary	214	32.6
	Secondary & above	245	37.3
Occupation	Farmer/Labourer	294	44.7
	Homemaker	212	32.3
	Service/Business	151	23.0

Table 2: Distribution of Behavioural Risk Factors for NCDs (n = 657)

Risk Factor	Category	Frequency (n)	Percentage (%)
Tobacco use	Current user	243	37.0
	Non-user	414	63.0
Alcohol consumption	Current user	196	29.8
	Non-user	461	70.2
Physical activity	Physically inactive	318	48.4
	Physically active	339	51.6
Dietary habits	Inadequate fruit/vegetable intake	427	65.0
	Adequate intake	230	35.0

Table 3: Anthropometric and Clinical Profile of Participants (n = 657)

Parameter	Category	Frequency (n)	Percentage (%)
Body Mass Index (BMI)	Underweight (<18.5)	87	13.2
	Normal (18.5–22.9)	264	40.2
	Overweight (23–24.9)	173	26.3
	Obese (≥25)	133	20.3
Hypertension status	Hypertensive	218	33.2
	Normotensive	439	66.8
Known diabetes	Present	121	18.4
	Absent	536	81.6

Table 4: Family History of Non-Communicable Diseases (n = 657)

Family History	Frequency (n)	Percentage (%)
Hypertension	204	31.1
Diabetes Mellitus	189	28.8
Cardiovascular	96	14.6

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(1), 607-613 | ISSN:2251-6727

disease		
No family history	302	46.0

Table 5: Health-Seeking Behaviour of Study Participants (n = 657)

Variable	Category	Frequency (n)	Percentage (%)
Healthcare utilization	Government facility	389	59.2
	Private facility	188	28.6
	Traditional/Home remedies	80	12.2
Regular health check-ups	Yes	214	32.6
	No	443	67.4
Treatment adherence (known NCD cases)	Regular	231	61.4
	Irregular	145	38.6

Table 6: Association Between NCD Risk Factors and Health-Seeking Behaviour (n = 657)

Risk Factor	Good Health-Seeking Behaviour n (%)	Poor Health-Seeking Behaviour n (%)	p-value
Tobacco use	89 (36.6)	154 (63.4)	<0.05
Alcohol consumption	71 (36.2)	125 (63.8)	<0.05
Physical inactivity	96 (30.2)	222 (69.8)	<0.01
Hypertension	124 (56.9)	94 (43.1)	<0.001

DISCUSSION

The present community-based cross-sectional study assessed non-communicable disease (NCD) risk factors and health-seeking behaviour among adults residing in a rural population of North India. The findings reveal a substantial burden of behavioural and metabolic risk factors, along with suboptimal health-seeking behaviour, highlighting the growing challenge of NCDs in rural settings.

Socio-demographic Profile and NCD Risk

In the present study, the majority of participants belonged to the economically productive age group of 31–60 years, with a slight male predominance. Similar age and gender distributions have been reported in other rural Indian studies, reflecting increased exposure to lifestyle-related risk factors during middle age [12]. A significant proportion of participants had low educational status and were engaged in agrarian or unskilled occupations, which may influence awareness, health literacy, and healthcare utilisation patterns.

Lower educational attainment has been consistently associated with higher prevalence of NCD risk factors and poorer health-seeking behaviour in rural populations [13]. Limited awareness regarding preventive healthcare and early symptoms of chronic diseases often leads to delayed diagnosis and complications.

Behavioural Risk Factors

The prevalence of current tobacco use (37%) observed in this study is comparable to findings from the Global Adult Tobacco Survey (GATS) India, which reported higher tobacco consumption in rural areas compared to urban settings [14]. Tobacco use remains a major modifiable risk factor contributing to cardiovascular diseases, cancers, and chronic respiratory illnesses.

Alcohol consumption was reported by nearly one-third of participants (29.8%), which is consistent with studies conducted in rural North India [15]. Harmful alcohol use is often underreported due to social desirability bias, suggesting that the actual prevalence may be even higher.

Journal of Chemical Health Risks

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JCHR (2026) 16(1), 607-613 | ISSN:2251-6727

Physical inactivity was observed in 48.4% of participants, indicating a shift towards sedentary lifestyles even in rural communities traditionally associated with higher physical activity. Mechanisation of agricultural practices and reduced manual labour may partly explain this trend [16]. Inadequate intake of fruits and vegetables was reported by 65% of participants, reflecting poor dietary diversity and nutritional imbalance, which are recognised contributors to obesity, diabetes, and cardiovascular diseases [17].

Anthropometric and Clinical Findings

The combined prevalence of overweight and obesity (46.6%) in the present study is alarmingly high for a rural population. Similar findings have been reported by recent rural studies, indicating that obesity is no longer confined to urban areas [18]. Excess body weight significantly increases the risk of hypertension, diabetes mellitus, and cardiovascular diseases.

Hypertension was detected in 33.2% of participants, which aligns with national estimates from rural India [19]. The prevalence of known diabetes mellitus (18.4%) further underscores the silent burden of metabolic disorders in rural communities. A considerable proportion of cases were previously undiagnosed, emphasising the need for regular screening at the primary care level.

Family History of NCDs

A positive family history of hypertension and diabetes was reported by nearly one-third of participants. Family history is a non-modifiable risk factor that significantly increases the likelihood of developing NCDs due to shared genetic and environmental influences [20]. Identification of high-risk individuals based on family history can facilitate targeted preventive interventions.

Health-Seeking Behaviour

The study revealed that government healthcare facilities were the preferred choice for the majority of participants, likely due to affordability and accessibility. However, regular health check-ups were reported by only one-third of participants, indicating poor utilisation of preventive healthcare services. Similar findings have been documented in other rural Indian studies, where healthcare is often sought only after the onset of symptoms [21].

Among participants with known NCDs, nearly 38.6% exhibited irregular treatment adherence, which is a major barrier to effective disease control. Factors such as financial constraints, lack of awareness, and long travel distances to healthcare facilities may contribute to poor adherence [22].

Association Between NCD Risk Factors and Health-Seeking Behaviour

The present study demonstrated a statistically significant association between behavioural risk factors (tobacco use, alcohol consumption, physical inactivity) and poor health-seeking behaviour. Individuals engaging in unhealthy behaviours were less likely to seek timely medical care, consistent with findings from previous studies [23]. In contrast, participants diagnosed with hypertension showed relatively better health-seeking behaviour, possibly due to increased contact with healthcare providers and awareness of disease complications.

Public Health Implications

The findings of this study highlight the urgent need for strengthening community-based NCD prevention and control strategies in rural areas. Integration of routine screening for hypertension, diabetes, and obesity into primary healthcare services, along with behaviour change communication targeting tobacco use, alcohol consumption, physical inactivity, and unhealthy diets, is essential. The WHO STEPS framework can serve as an effective tool for ongoing surveillance and intervention planning [11].

CONCLUSION

This community-based study demonstrates a high prevalence of behavioural and metabolic risk factors for non-communicable diseases among adults in a rural population of North India. Tobacco use, alcohol consumption, physical inactivity, unhealthy dietary practices, overweight/obesity, hypertension, and diabetes were commonly observed. Health-seeking behaviour was suboptimal, with low rates of regular health check-ups and inconsistent treatment adherence.

The findings highlight the urgent need for strengthening primary healthcare services through regular screening, early detection, and community-based health education. Targeted interventions focusing on lifestyle

modification and improved healthcare utilisation are essential to reduce the growing burden of non-communicable diseases in rural areas.

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