

Behavioural And Biological Risk Factors of Non-Communicable Diseases Among the Selected Tribal People of Pune District

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ABSTRACT

Introduction: Non-communicable diseases (NCDs) are a growing concern globally, contributing to millions of deaths, especially in low- and middle-income countries. In India, NCDs account for a significant proportion of deaths, and rural tribal populations are increasingly vulnerable to these diseases due to changing lifestyles. This study focuses on assessing behavioural and biological risk factors for NCDs among tribal adults in Pune District.

Aims of the Study: To evaluate the prevalence of behavioural and biological risk factors for NCDs in the tribal population of Pune District,

Methodology: A quantitative, descriptive research design was employed, with 100 tribal adults selected using a non-probability convenient sampling method. Data were collected through demographic surveys, anthropometric measurements, and health screenings, including blood pressure, blood glucose levels, and urine analysis.

Results: The majority of participants were males (58%), aged 35-44 years (28%), with a significant prevalence of tobacco (58%) and alcohol use (52%). Elevated blood pressure (65%) and abnormal biological parameters, such as blood glucose and urine protein, were observed, indicating potential NCD risks.

Conclusion: The study highlights the high prevalence of NCD risk factors in the tribal population of Pune District. Despite the awareness of these risks, the management and control of blood pressure and blood glucose were suboptimal, emphasizing the need for improved healthcare interventions in this population.

Keywords: Non-communicable diseases, Behavioral risk factors, Biological risk factors, Tribal population, and Health screenings.

1. INTRODUCTION

The increasing burden of non-communicable diseases (NCDs) urges continuous survey of risk factors in different population groups. Non-communicable diseases (NCDs) are of major concern in the 21st century. Modern lifestyle has made people vulnerable to many chronic NCDs. NCDs were attributed for 38 million deaths globally in 2012; 70% were premature. Almost 80% of the NCD deaths were observed in low- and middle-income countries. In South-East Asian region, there has been an increase in NCD deaths since 2000. 60% of total deaths in India in 2012 were attributed to NCDs. Mortality data from rural India depicted NCD as the most common cause of death (32%). Most of the NCDs are attributable to eight modifiable risk factors, and WHO has classified them into behavioural and biological risk factors. The modifiable risk factors if timely controlled could prevent the emergence of future NCDs. Thus, comprehensive population-wide surveillance is required to identify pattern and distribution of risk factors across population groups within and across countries. "WHO STEP-wise approach to NCD risk factor surveillance (STEPS)" is a standardized tool using standard protocols and questionnaire for collecting and analysing the NCD risk factors. In India, NCD risk factor survey was conducted through integrated disease surveillance project in 2007–2008. Some studies have also been conducted in this context, but mostly are in general population. India has the second largest tribal population in world (8.6% of the country's total population). Early detection and tracking of risk factors can reduce the occurrence of lifestyle diseases. A population-based program of screening of lifestyle diseases may be beneficial for the prevention of non-communicable diseases

Need of the study:

Tribal communities face the “triple burden” of disease. Apart from high rates of malnutrition and communicable diseases (TB, leprosy, HIV etc.), the advent of rapid urbanisation, and changing lifestyles and environment, has led to a rise in non-communicable diseases as well (cancer, diabetes, and hypertension). These are both in addition to the burden of mental illness and subsequent addiction.

Rapid development of mankind has led to progress but has also been enduring uncountable lifestyle diseases. Emerging technologies has drastic change in day-to-day routines of people, consequences being multiple life-style diseases. Reports suggest high mortality worldwide owing to lifestyle diseases.

Tribal populations having distinctive characteristics, customs, and practices; living in isolated geographic areas; and remaining untouched with the modern society are also vulnerable of developing lifestyle diseases. In Maharashtra Only limited researches attempted to explore the NCD risk factors and very few among tribal population. Hence, the present study will be conducted with the objectives to assess the prevalence of various behavioural and biological risk factors among rural tribal population Sub-division and to explore the associated sociodemographic factors.

Tribal population is supposed to be residing in serene natural habitats and following traditional lifestyle. But we are noticing changes in the health and disease patterns in tribal who seem to be catching up on lifestyle diseases in order to reduce these problems. We need to understand the extent and probable causes of the NCD in this subgroup. Maharashtra is considered a developed state and thereby tribals are thought to be miniscule and often ignored. This study attempts to highlight their health issues.

2. MAERIALS AND METHODS

The study followed a quantitative research approach using a descriptive research design to examine the behavioural and biological risk factors associated with non-communicable diseases (NCDs) among tribal populations in selected areas of Pune Districts. The target population for the research consisted of tribal people from specific regions within Pune Districts. The assessable population included tribal individuals who were available during the data collection period, focusing on those who met the inclusion criteria. A convenient sampling technique was used to select participants who were readily accessible during the research period. The study sample comprised 100 tribal adults who met these criteria and were available at the time of data collection.

3. RESULTS

Section I- Demographic data includes- age, gender, education, occupation, monthly income, marital status, No of family members etc

The majority of participants in this study were aged between 35-44 years (28%), with males making up 58% of the sample. Most participants had completed secondary education (41%) and identified as Hindu (57%). A large proportion were married (73%), with homemakers representing 26% of the sample, followed by those in private jobs (23%) and business owners (24%). In terms of income, the majority had a family income between Rs. 10,000 - Rs. 20,000 (35%), and most participants belonged to the lower socio-economic class (48%). Regarding family history, hypertension (HTN) was the most common condition reported (39%). As for behavioural risk factors, 58% of participants used tobacco, 52% consumed alcohol, and 57% had a Misari chewing habit.

Section II- Physical Measurement includes Height, Weight, BMI, WHR, etc

Heart Rate: The most common heart rate range is **72-80 beats/min** (37%), followed by **81-89 beats/min** at 29%. Both of these values are relatively normal for adults.

Blood Pressure: The majority of participants fall into the **moderate blood pressure** range (140-150 mmHg) at 32%, and **high blood pressure** above 150 mmHg is also significant at 33%, suggesting a need for attention to blood pressure management.

Weight: The most common weight range is **58-62.25 kg** (34%), followed closely by **62.26-66.5 kg** (31%). Only a small portion falls into the higher weight categories, indicating that the majority of individuals in this group have a normal weight range.

Height: The majority of participants have a height in the **164-170 cm** range (36%), with the second most common range being **148-155 cm** (31%).

BMI: The majority of participants have a **normal BMI** (53%), while **overweight** individuals comprise 33%. Only a small percentage (14%) is categorized as **obese** (BMI between 30.1-35).

Section III – Systemic Disease Measurements- it includes history of Hypertension, Diabetes, Cancer or any other family history of this disease. **Behavioural Measurements-** it includes presence of risk factors like tobacco use, Alcoholism, Smoking, use of Masheri, Physical Inactivity, Dietary practices.

Table no: 1 Distribution of Cancer Signs by Severity Level

SIGNS OF CANCER	f	%	Mean	SD
MILD (0 - 3)	91	91.00	2.01	1.26
MODERATE (4-6)	7	7.00		
SEVERE (7-9)	2	2.00		

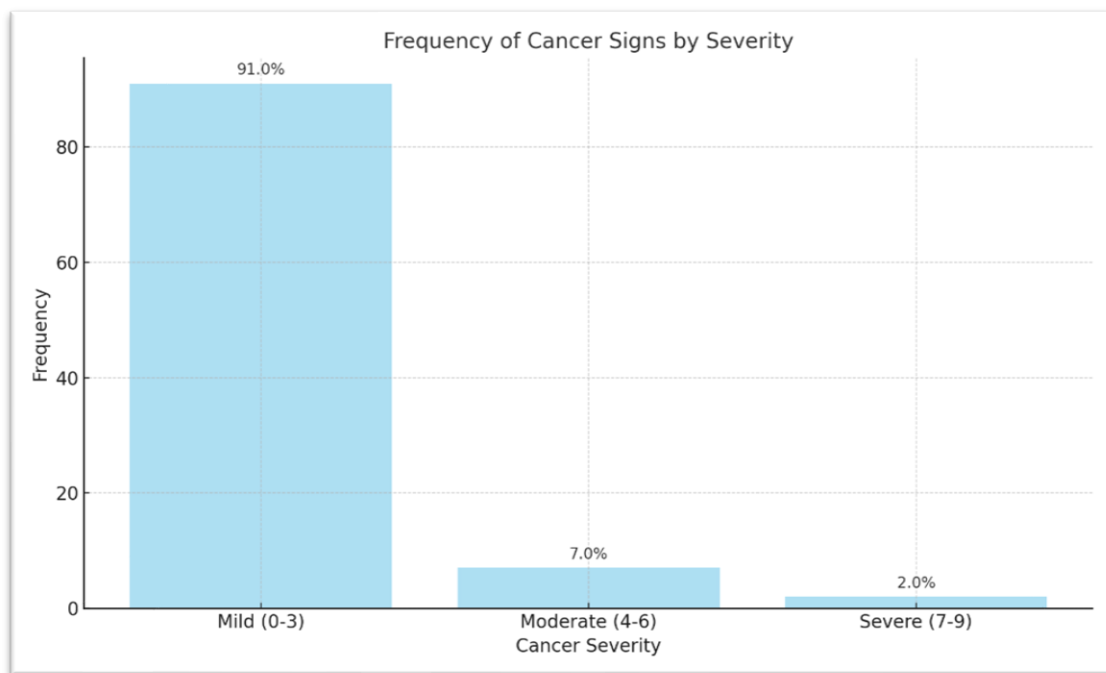


Figure no 1: bar chart that visualizes the frequency and percentage distribution of the different severity levels of cancer signs

The data shows that 91% of individuals report mild signs of cancer, with a frequency of 91. Only 7% show moderate signs, and 2% exhibit severe signs. The average score for mild signs is 2.01, with a standard deviation of 1.26, indicating slight variation within this group. Overall, most individuals experience mild cancer symptoms, while severe symptoms are rare.

Table no 2: Distribution of Cancer Signs: Presence and Absence

Sr. No	Signs of cancer	Present	Absent
1	An unexplained lump or swelling	19	81
2	Persistent unexplained pain	25	75
3	Unexplained bleeding	18	82
4	A persistent cough or hoarseness	24	76
5	A persistent change in bowel or bladder habits	15	85

6	Persistent difficulty in swallowing	24	76
7	A change in the appearance of a mole (shape, size, colour and thickness)	20	80
8	A sore that does not heal	24	76
9	Unexplained weight loss	32	68

The data shows several signs of cancer and shows the number of individuals who report each sign as either present or absent. Among the signs, unexplained weight loss is the most commonly reported, with 32 individuals indicating its presence, while 68 report it as absent. Persistent unexplained pain follows closely, with 25 individuals reporting it as present and persistent difficulty in swallowing is also frequently reported by 24 individuals. Other signs, such as a persistent cough or hoarseness and a sore that does not heal each have 24 people reporting their presence. The least common sign is a persistent change in bowel or bladder habits, with only 15 individuals indicating it as present, while 85 report it as absent.

The data provides insights into various smoking habits and behaviours among individuals. The most common behaviour is using cigarettes and bidis, with 86 individuals admitting to this habit, making it the predominant form of tobacco consumption in the group. Smokeless tobacco and hookah use are also fairly common, both with 72 individuals reporting their use. Combustible tobacco products (like cigarettes and cigars) are used by 76 individuals, while using two or more tobacco products is less frequent, with 63 individuals engaging in this behaviour. When it comes to quitting, 69 individuals have tried to quit smoking, suggesting a significant effort to stop, while 31 have not attempted to quit. Additionally, 75 individuals report using Betel quid with tobacco, and 70 individuals have been advised to quit smoking tobacco.

The data provided valuable insights into the habits and awareness of individuals regarding chewing tobacco use. A large majority, 80 out of 100, have used tobacco products, and 87 individuals have chewed tobacco, including Pan, Gutka, and Supari. Among those who chew tobacco, 74 individuals are regular users, and another 74 have easy access to tobacco products. Most individuals (78) chew tobacco products between 5 to 10 times a day, while 22 chew less frequently. Interestingly, despite the widespread usage, 68 individuals are aware of the harmful effects of chewing tobacco, although 32 are not. In terms of oral hygiene, only 70 individuals report cleaning or brushing their teeth regularly, suggesting a gap in self-care among some tobacco users. Additionally, 76 individuals use chewing tobacco for medicinal purposes, and 74 have experienced dental or gum problems due to their habit. Lastly, 78 individuals have made attempts to quit chewing tobacco, indicating some level of awareness and effort to stop, despite the challenges posed by the habit.

The data reveals that Maseri use is widespread, with 80 individuals having used it and 85 being regular users. Most users (75) chew Maseri 5-10 times a day, and 76 individuals find it easily accessible. While 80 individuals are aware of its harmful effects, only 69 wash their mouths after use, and 71 keep it in their mouths for long periods. Dental and gum problems are reported by 72 individuals. Despite the risks, 75 people have tried to quit, and 79 depend on Maseri to start their work, indicating a psychological habit.

The data reveals that alcohol use has a significant impact on individuals, with 82 people drinking more than planned and 85 having tried to quit. Many individuals frequently think about drinking (77) and experience cravings (75). Alcohol use has affected work, with 81 missing work and 71 quitting due to drinking, and 72 reporting negative effects on social or family relationships. Additionally, 76 individuals acknowledge drinking causing dangerous situations, while 74 have health problems related to alcohol. Lastly, 80 people experience issues when going without alcohol, indicating a dependency on it.

The data highlights the physical activity habits of individuals, showing that a majority engage in vigorous-intensity activities (81) like farming, fishing, and stone cutting, as well as recreational activities (84) that impact vital signs. Most individuals (76) participate in either intense or recreational activities daily, with 75 doing vigorous activities that cause fewer changes in vitals. Additionally, 80 individuals spend a normal amount of time (3-5 hours) on physical activities, and 73 take 8-10 hours of rest daily. Many individuals (71) include vigorous activities as part of their work, and 78 walk or use a bicycle for transportation.

This suggests that physical activity is well integrated into their daily lives, with a balance between exercise, work, and rest.

The table reveals that most individuals consume fruits and vegetables regularly, with 81 eating one fruit a day and 85 eating one vegetable daily. However, some individuals consume fruits or vegetables less frequently, and 74 report not eating fruits at all. While many are aware of the importance of reducing salt intake (68) and believe too much salt is harmful (72), there remains a notable portion unaware of these concerns. This indicates a good level of awareness about fruit and vegetable intake but mixed awareness about the impact of salt on health.

IV- Biological Parameters includes BSL Random. Urine protein & Sugar analysis.

The provides data on Random Blood Glucose, Urine Protein (milligrams), and Urine Sugar (mg/dl).

Random Blood Glucose: The values for random blood glucose vary between 95 and 175 mg/dl, with most individuals having blood glucose levels above 100, suggesting potential concerns about blood sugar regulation for many in this dataset.

- Urine Protein: The urine protein levels range from 16 to 175 milligrams, which is significant because elevated levels of protein in the urine can indicate kidney issues. For instance, values like 175 mg are on the higher end and may warrant medical attention.
- Urine Sugar: Urine sugar levels show a range from 0.589 mg/dl to 12.58 mg/dl, with many individuals showing higher levels, especially those with elevated blood glucose. High levels of urine sugar could be an indication of uncontrolled blood sugar levels, a potential sign of diabetes.

4. DISCUSSION

The present study focused on assessing the behavioural and biological risk factors for non-communicable diseases (NCDs) among the tribal population of Pune District.

The findings indicated a high prevalence of risk factors, with 58% of participants using tobacco and 52% consuming alcohol. Hypertension was the most common family history condition (39%), and a significant proportion of participants exhibited moderate to high blood pressure (65%). Regarding weight and BMI, the majority had a normal range, although 33% were classified as overweight. Biological parameters, including random blood glucose and urine protein levels, indicated potential risks for diabetes and kidney issues, with some individuals showing elevated levels. The study also noted that 91% of participants reported mild cancer symptoms, with unexplained weight loss and persistent pain being the most common signs. Physical activity was common, with 81% of participants engaging in vigorous exercise, and many consumed fruits and vegetables regularly, suggesting positive lifestyle practices.

These results are consistent with similar studies, such as Bhar (2019), which found high rates of tobacco and alcohol use, unhealthy diets, and abdominal obesity in rural tribal populations. Both studies underscore the importance of addressing lifestyle risk factors like tobacco and alcohol use, promoting healthier diets, and conducting regular health screenings to prevent the onset of NCDs in these populations.

INTERPRETATION

Strengthening of primary health care services and community-based interventions are urgently required to improve awareness and control of NCD risk factors in the rural areas of tribals in Pune District.

5. CONCLUSION

In conclusion, the study highlights the significant prevalence of non-communicable disease (NCD) risk factors among the tribal population of Pune District. Behavioral risk factors such as tobacco use, alcohol consumption, and unhealthy dietary habits were commonly observed. Additionally, biological markers such as elevated blood pressure, blood glucose, and urine protein levels were concerning. Despite awareness, the management and control of these health risks remain suboptimal. This underscores the need for targeted health interventions and awareness programs aimed at improving the control and prevention of NCDs in this underserved tribal population.

DECLARATION BY AUTHORS:

Ethical Approval: The study was approved by the institutional ethics committee of Bharati Vidyapeeth (Deemed to be University), Pune. The study participants were briefed about the purpose and nature of the study and written informed consent was obtained before data collection.

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Conflict of Interest: The authors declare no conflict of interest

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