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Alcohol Consumption and Its Association with Health Traits: An Exploratory Study of the Oraon Scheduled Tribes of West Bengal

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Abstract

There are few studies on alcohol consumption, its demographic and socio-economic determinants, and its association with health traits among scheduled tribes in India. The present study explores the demographic and socio-economic determinants of alcohol consumption, and its association with selected health traits among Oraons of West Bengal, India. Data were collected from 475 adult Oraons living in rural and urban areas of North 24 Parganas, West Bengal. Demographic, socio-economic, behavioural and alcohol consumption data were collected using a well-tested questionnaire. Data on health traits including anthropometric traits, blood pressure and pulse rate were collected using standard techniques and instruments. Descriptive statistics, t-statistics, χ^2 test and logistic regression were used to analyse the data. Around 36 percent of the surveyed individuals consumed alcohol and around 22 percent of the drinkers consumed it daily. Findings indicate the percentage of users was higher for males, older ages, rural dwellers, the married, non-literates, daily wage earners and low-income persons. Males and individuals thirty years of age and older were more likely and household workers were less likely to consume alcohol. Associations of alcohol consumption with health traits were statistically significant for most of the health traits. However, in multivariate and multinomial regression alcohol consumption was not significantly associated with any health traits. Nevertheless, targeted interventions may be needed especially among the youth, women, and old men.
Keywords: Alcohol consumption; Socio-demographic determinants; Body composition; Blood pressure; Oraon indigenous group; Rural-urban

1 Introduction

Alcoholic beverages are popular worldwide although their active ingredient ethanol is a psychoactive and toxic substance that can cause dependence (WHO 2024). It has been reported that a total of 2.3 billion people consume alcohol worldwide, with variation across regions and across populations (WHO 2018). It is also reported that alcohol consumption varies across demographic, socio-economic and behavioural variables and cause effect in health and well-being (WHO 2024). Alcohol abuse contributes to injuries, infectious diseases and some mental ill-health conditions, causing 2.6 million deaths in 2019 (WHO 2024). Considering these facts as a public health priority, a global strategy to reduce harmful use of alcohol was conceived in 2010, with an action plan for the 2022 to 2030 period to effectively implement the global strategy (WHO 2024). Now, a decreasing trend of alcohol consumption since 2010 has been reported worldwide, but an increasing trend is also observed in some regions including south-east Asian regions (WHO 2024). Consumption of distilled alcoholic beverages (WHO 2024) and unrecorded consumption are high in parts of Asia including India (WHO 2014), yet control measures are scattered and state-specific. Further, In India, Scheduled Tribe (ST) communities are reported to exhibit poor health status (Government of India, 2018), where alcohol abuse may contribute to their poorer health and wellbeing. However, studies on alcohol consumption and its association with health traits among indigenous people in India are limited. Thus, there remains a need for more study with effective recommendations to control alcohol abuse, especially among ST communities.

In India, the prevalence of alcohol consumption has decreased slightly but it is still higher for both males and females in eastern and north-eastern regions than in the rest of the country, especially among ST men and women (Balasubramani et al., 2021). Alcohol abuse among indigenous people (equated here with Scheduled Tribes) is an area of concern because of association between alcohol consumption and non-communicable diseases and ailments

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(Negi et al., 2016; Sajeev & Soman, 2018). The World Health Organization (2014) mentioned that underreporting and non-reporting of alcohol consumption is high in India. This problem includes the ST communities. However, alcohol is embedded with tradition and custom of the indigenous people (Pati et al., 2018). The production and consumption of traditional alcoholic drinks is customary for indigenous communities worldwide including India (Sahoo et al., 2024). These customs and traditions of ST communities and the permission for home production also made alcohol easily available and consumable for young individuals (Sadath et al., 2019), even to pregnant women (Pati et al., 2018). Further, tribal people can prepare alcohol at home for own use but the list of ingredients and detailed methods are not well documented (Rawat et al., 2021). At this point, the study of their alcohol consumption habit and its effect on their health status is required.

It has been reported that substance use habits in India, including alcohol consumption, are determined by a range of demographic and socio-economic characteristics like age, sex, ethnicity and employment status (Sadath et al., 2022). Further social factors like parental influence, home environment and peer pressure also contribute to alcohol consumption at younger ages (Sadath et al., 2019). Tradition and custom of tribal people along with lack of social monitoring and easy availability also determine alcohol consumption (Pati et al., 2018). Considering these factors, the study limits itself to a single ethnic and social group with common tradition and custom, aimed at understanding the demographic and socio-economic determinants of alcohol consumption. This may help to propose effective interventions to control abuse.

Generally, the indigenous groups in the country prepare traditional alcoholic beverages by fermenting various cereals, mostly rice (Rawat et al., 2021). Rice beer or *Handia* is the traditional drink of Oraon (A. K. Das & Raha, 1963), the studied indigenous group. They prepare this beverage by fermenting rice for about three days and mixing fermenting balls (termed *bichi*) with rice. A sufficient amount of water is added with the fermented material and the strained water is consumed as *Handia* (A. K. Das & Raha, 1963). The percentage of alcohol in *Handia* is about 9–10% (Chowdhury et al., 2006). *Chullu* or *Cholai* is prepared by distilling the *Handia* mixture to increase the alcohol content (Saha et al., 2015). For preparing the fermenting material, dust of rice is mixed with dust of four types of plant remains namely *H. pubescens*, *W. volubilis*, *I. frutescens* and *C. viscosum* (Saha et al., 2015). *Chullos*, with an alcohol concentration of 40–50%, is also prepared by fermenting low-quality molasses with yeast and distilling it (Chowdhury et al., 2006).

It has been reported that alcohol consumption is significantly associated with several non-communicable ailments and diseases for the general population (Mishra et al., 2022; Sharma et al., 2024) as well as for the ST people (Negi et al., 2016; Sajeev & Soman, 2018). Alcoholic tribal people were reported to be more malnourished than non-alcoholic people (Ho & Mishra, 2018). Alcohol consumption along with other socio-demographic and behavioural factors has a significant association with hypertension (Vennam et al., 2024). Some scattered studies also relate to psychiatric morbidity and alcohol use disorder (Gharat et al., 2024), alcohol consumption of tribal pregnant women (Pati et al., 2018) and parental alcohol consumption and malnutrition of children (Menon et al., 2024). However, there remains a need for more studies to understand the effect of alcohol consumption on the health status of the ST people.

Further, the ST population in India is reported to misuse substances, including alcohol (Sadath et al., 2025), but unlike other intoxicants, rules and regulations controlling alcohol misuse are mostly State-specific (Schess et al., 2023). However, ST people enjoy permission for home preparation of traditional alcoholic beverages throughout the country. Thus, reducing alcohol use in these communities requires a special strategy which will encourage maintaining tradition, custom and heritage but discourage alcohol abuse. Considering these facts the article aims to explore the alcohol consumption habits and associated health traits among a single ST community. It is hypothesised that alcohol consumption within the studied group is determined by socio-demographic factors, and the selected health traits differ significantly between drinkers and non-drinkers.

In view of this, the objectives of the study are:

i) To explore the alcohol consumption habits among the study participants and find out the demographic and socio-economic determinants of the habit.

ii) To understand associations between selected health traits and alcohol consumption of the study groups.

2 Materials and Methods

2.1 Population and study area

The present cross-sectional study was conducted among Oraons, the second largest ST population of West Bengal (643,510 persons; Census of India, 2011). The Oraons mostly live in the eastern part of India. In West Bengal, they are well distributed in both rural and urban areas (Census of India, 2011), in close proximity to non-indigenous communities. Apart from agriculture they are engaged in other occupations as well. They are an originally Dravidian

speaking, endogamous ethnic group with specialized knowledge in agriculture (S. C. Roy, 1915). A few scholars reported nutritional status and body composition of this community (Chakraborty et al., 2011; Datta Banik, 2008; Mittal & Srivastava, 2006; S. K. Roy & Kundu Chowdhury, 2013), but alcohol consumption habits and their association with different health traits are still largely unknown.

The Oraon people of the current study live in rural and urban areas of Barrackpore sub-division, North 24 Parganas, West Bengal, India. Within the State, Oraons in the northern part are mainly agricultural and tea garden labourers. The study excludes these habitations as most of them were brought to these areas from other areas as tea garden labourers during the colonial period. The second largest habitation of Oraon people is in North 24 Parganas, where along with their traditional occupation agriculture they are also involved as industrial labourers. The Oraon habitations within and adjacent to industrial areas were excluded as the aim of the study is to explore selected health traits and associated behaviour of rural and urban Oraon. In the rural area, the researchers chose three small settlements under Naihati police station and in the urban area five small settlements under Khardah and Ghola police stations of Barrackpore sub-division because these settlements were exclusively occupied by the Oraon people. All households in both areas were completely enumerated for collection of socio-demographic data.

No statistical sampling was adopted for the selection of households/individuals because it would create suspicion in the field and would hamper data collection. Rapport with the members of the community was established before data collection, and this makes them well informed about the aims of the study. All adults (rural 283 males, 291 females; urban 309 males, 298 females) were approached for health traits (anthropometric, blood pressure and pulse rate) and alcohol consumption data. Those who agreed to take part in the process were incorporated as study subject after giving written consent. Finally, data were collected from 475 adult individuals (148 males and 327 females) including 171 alcohol drinkers and 304 alcohol non-drinkers. To avoid inter-observer error one of the authors (TKC) collected the entire data. The study was conducted in compliance with the Scientific Ethical Committee for Protection of Research Risks to Humans of the parent institute (ISI) of the authors.

2.2 Data types and collection

Data includes demographic, socio-economic, alcohol consumption habit, and health traits in terms of anthropometry (height, weight and waist circumference), systolic and diastolic blood pressure, and pulse rate of each individual. Demographic data includes age, sex, marital status and place of living which were collected using a well-tested household census schedule. Socio-economic data includes educational status, occupational types and economic status in terms of monthly household expenditure which were collected using a standard questionnaire/schedule. Data on household characteristics and household assets were collected by questionnaire. Economic status for each individual was assessed in terms of item-wise monthly household expenditure, and then divided into two parts on the basis of median value of that expenditure. Data on alcohol consumption habits was collected using a well-tested questionnaire. The data is part of a bio-social project on health and lifestyle of Oraons. In this project, initially data on habitual physical activity and food habit were collected from the adult participants and thereafter a semi-structured questionnaire was formed. This questionnaire was tested in various segments of the people (across area of living, sex, economic group and age group) and the questionnaire was modified and finalized accordingly. The entire data were collected by visiting the people several times. Three sets of forms were prepared for data collection: 1st Census schedule to collect socio-demographic data, 2nd questionnaire to record habitual physical activity and food habit, 3rd a semi-structured questionnaire to collect behavioural data including substance use. Anthropometric data includes height, weight, and waist circumference (WC), which were collected following standard instruments and technique (Weiner & Lourie, 1981). Body mass index (BMI) was calculated using the following formula:

$$\textbf{Body Mass Index (kg/m}^2\textbf{) = Body weight (kg) / Stature (m)}^2$$

Body fat percentage was measured using a bio-electrical impedance analyser (Omron body fat monitor, Model: HBF-375 Karada Scan) (Roubenoff, 1996). During measurements, the subjects were barefoot and wearing light apparel. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured following the standard protocol of the American Heart Association (Pickering et al., 2005). Pulse rate was measured by feeling the radial artery for 30 seconds, after a 10 minutes rest period, in a sitting position on the left arm of the subjects.

2.3 Classification of data

The demographic and socio-economic data were classified separately for alcohol consumption groups (drinker vs. non-drinker). Standard cut-off values for different health traits (e.g. BMI, WC, Fat% and blood pressure) were used as classification criterion, which have been presented in Table 1.

Table 1: Definitions used in this study

Health trait	Category (cut-off)	Source
BMI (kg/m^2)	Underweight ($<$18.50)	WHO (2004)
	Normal (18.50–22.99)	
	Overweight/Obese ($\geq$23.00)	
Waist circumference (cm)	Normal (males $<$94 cm, females $<$80 cm)	WHO (2011)
	Not normal (males $\geq$94 cm, females $\geq$80 cm)	
Fat%	Normal (males $<$25%, females $<$35%)	WHO (1995)
	Not normal (males $\geq$25%, females $\geq$35%)	
Blood pressure (mmHg)	Normal (SBP $<$120 and DBP $<$80)	Chobanian et al. (2003)
	Pre-hypertensive (SBP 120–139 and/or DBP 80–89)	
	Stage-1 hypertensive (SBP 140–159 and/or DBP 90–99)	
	Stage-2 hypertensive (SBP $\geq$160 and/or DBP $\geq$100)	

2.4 Analysis of data

Demographic and socio-economic characteristics and health traits (BMI, WC, systolic and diastolic blood pressure and pulse rate) were tabulated with frequency and percentages across alcohol consumption groups (drinker vs. non-drinker). χ^2 values were computed to explore the statistical significance of associations between alcohol consumption groups and health trait categories. Multivariate logistic regression analysis was done to find significant determinants of alcohol consumption and also to predict the effect of alcohol consumption on selected health traits. All the data were analyzed using SPSS version 16.0 (SPSS Inc., Chicago, IL, USA).

3 Results

Table 2 shows the demographic and socio-economic characteristics of the study population and the prevalence of alcohol drinkers. Alcohol drinking was marginally more prevalent among rural than urban study participants and alcohol drinking prevalence increased with increasing age. 75% of the men and 18% of the women had the habit of alcohol consumption irrespective of their marital status. Non-literate individuals (41%) and those with up to primary level education (44%) had a higher prevalence than individuals with higher education (around 30%). Among the occupational groups, the category of business persons / service persons / pensioners had the highest prevalence of alcohol consumption while household workers (mainly women) were least likely to consume alcohol. Relationships of alcohol use with household size and earnings were minimal.

Table 2: Demographic and socio-economic characteristics of the study population and the prevalence of alcohol drinkers

Demographic & socio-economic characteristics		Population profile (N=475)		Prevalence of drinking	
		No.	%	No.	%
Place of living	Rural	258	54.3	96	37.2
	Urban	217	45.7	75	34.6
Age groups	Below 30 years	185	38.9	33	17.8
	30–44 years	154	32.4	56	36.4
	45 years & above	136	28.6	82	60.3
Sex	Male	148	31.2	111	75.0
	Female	327	68.8	60	18.3
Marital status	Married	355	74.7	128	36.1
	Unmarried/Widowed/Separated	120	25.3	43	35.8
Educational status	Non-literate	175	36.8	71	40.6
	Primary (Class I–IV)	57	12.0	25	43.9
	Secondary (Class V–X)	207	43.6	63	30.4
	Higher secondary & above (Class XI+)	36	7.6	12	33.3
Occupational types	Daily wage earners	253	53.3	111	43.9

Characteristics		No.	%	No.	%
	Business / Service / Pensioner	48	10.1	33	68.8
	Household worker	137	28.8	15	10.9
	Student / Unemployed / Aged dependent	37	7.8	12	32.4
Household size	Up to 4 members	209	44.0	71	34.0
	5–8 members	218	45.9	82	37.6
	9 & above members	48	10.1	18	37.5
Sharing of single living room	Up to two members	142	29.9	27	19.0
	3–4 members	256	53.9	95	37.1
	5 & above members	77	16.2	49	63.6
Economic condition (relative to median)	Low (< -0.0673)	237	49.9	94	32.9
	High (≥ -0.0673)	238	50.1	77	39.1

Table 3 shows the alcohol consumption habits and some related perceptions of the study participants including males and females. Every 3 out of 4 males and 1 out of 5 females currently consume alcoholic beverages. About 36% of the total participants were current alcohol drinkers, but a majority of the drinkers (56%) reported that they consume alcohol occasionally. Only around 22% consume it daily. Less than one third of both males and females reported consumption of more than 200 ml at a time, and many of them had the drinking habit for 15 years and more. Peer influence is the most frequently endorsed reason for drinking, indicating that most drinking individuals can be described as “social drinkers”. Most of the male drinkers (69%) reported the habit as ‘Bad’ due to the fact that alcohol has an ill effect on health. Interestingly, more than half of the female drinkers (58%) reported the habit as ‘Good’ due to the fact that alcohol keeps the body cool, helps to sleep well and there is no harm if drinking remains within limits. Still, an overwhelming majority of both male and female participants did not know the impact of alcohol consumption on their health. Only few of the male drinkers (17%) reported that they can quit alcohol any time, if they want; and around one third of the male drinkers reported that they were planning to quit the alcohol drinking.

Table 3: Alcohol drinking habits and some related perceptions of the study participants

Variable		Overall (n=171)	Male (n=111)	Female (n=60)
	No.	%	%	%
Currently drink alcohol (Total=475; Male–148 & Female–327)	171	36.0	75.0	18.3
Frequency of alcohol intake				
Daily	38	22.2	25.2	16.7
2–5 days in a week	23	13.5	18.0	5.0
Once in a week	15	8.8	11.7	3.3
Occasional	95	55.6	45.0	75.0
Amount per time				
Up to 100 ml	64	37.4	40.5	31.7
101 ml–200 ml	55	32.2	27.0	41.7
$>$200 ml	52	30.4	32.4	26.7
Years with drinking				
$<$5 Years	41	24.0	18.9	33.3
5–14 Years	58	33.9	33.3	35.0
$\geq$15 Years	72	42.1	47.7	31.7
Why drink alcohol				
Like to drink	21	12.3	11.7	13.3
Remove stress	14	8.2	9.9	5.0
Peer influence	78	45.6	42.3	51.7
Relief from bodily discomfort	24	14.0	17.1	8.3
Enhance work energy	11	6.4	8.1	3.3
Good sleep	7	4.1	6.3	–

Variable	No.	%	%	%
During festival	16	9.4	4.5	18.3
Perceive drinking alcohol as				
Good	64	37.4	27.0	56.7
Bad	95	55.6	68.5	31.7
Don't know	12	7.0	4.5	11.7
Reason for "Good"				
Keep the body cool	30	17.5	8.1	35.0
Helps to sleep well	15	8.8	9.0	8.3
No harm within limit	10	5.8	6.3	5.0
Don't know	9	5.3	3.6	8.3
Reason for "Bad"				
Ill effect on health	20	11.7	13.5	8.3
Don't know	75	43.9	55.0	23.3
Impact on health				
Harmful to health	8	4.7	4.5	5.0
Make the body cool	10	5.8	1.8	13.3
Good for health	8	4.7	1.8	10.0
Don't know	145	84.8	91.9	71.7
If want, can quit anytime	21	12.3	17.1	3.3
Time required to quit				
1 month	4	2.3	2.7	1.7
2–3 months	6	3.5	5.4	–
$\geq$ 6 months	11	6.4	9.0	1.7
Don't know	150	87.7	82.9	96.7
Planning to quit	48	28.1	36.9	11.7
Reasons behind planning to quit				
Illness	4	2.3	2.7	1.7
No reason / Don't know	167	97.7	97.3	98.3

Table 4 depicts the opinion of the study participants about the impact of media on alcohol intake. An overwhelming majority of both alcohol drinkers (86%) and non-drinkers (93%) reported that they watch television advertisements on alcohol. They also know about media reports of alcohol's health effects, but do not believe that media influence causes people to start drinking.

Table 4: Opinion about impact of media on alcohol intake

Variable		Alcohol drinker (n=171)		Alcohol non-drinker (n=304)	
		No.	%	No.	%
Ever watch television advertisement on alcohol	Yes	148	86.5	283	93.1
	No	23	13.5	21	6.9
Media helps to start alcohol intake	Yes	12	7.0	2	0.7
	No	159	93.0	302	99.3
Aware of harmful effect of alcohol intake through media	Yes	165	96.5	287	94.4
	No	6	3.5	17	5.6
Why still use alcohol	Just for addiction	105	61.4		
	Due to work related issues	8	4.7		
	Time passes only	3	1.8		
	Peer pressure	21	12.3		
	Planning to quit	16	9.4		
	No harm if intake within limit	12	7.0		
	Other reasons	1	0.6		

Variable	No.	%	No.	%
Don't know	5	2.9		

Table 5 shows the results of multivariate logistic regression of alcohol consumption status on different demographic and socio-economic characteristics of the study participants. In this analysis, two different logistic regression models were used to find out significant associations between dependent and independent variables. Both models found significant associations of alcohol consumption with age groups, sex, and occupational status of the study participants. The R square values and percentage of cases with correct prediction between the two multivariate logistic models were also similar (enter model R^2 = .494, 80.0% and stepwise model R^2 = .479, 79.4%) showing that a model with fewer predictor variables could predict the alcohol consumption status as accurately as did the complete model.

Therefore, the backward stepwise logistic regression model can be used as an alternative for the analysis, where it was found that those being male and those being older than 30 years were more likely to consume alcohol than their respective counterparts. Household workers, mostly the women folk, were less likely to consume alcohol than other occupational categories even when sex and other demographic and socio-economic characteristics were controlled.

Table 5: Multivariate logistic regression of alcohol consumption status on demographic and socio-economic characteristics of the study participants

Demographic and socio-economic characteristics	**Logistic regression models**	
	Multivariate Odds ratio (95% CI)	**Backward stepwise** Odds ratio (95% CI)
Place of living		
Rural	Ref.	–
Urban	1.53 (0.86–2.72)	
Age groups		
Below 30 years	Ref.	Ref.
30–44 years	2.63* (1.27–5.46)	2.46** (1.29–4.69)
45 years & above	7.44*** (3.35–16.56)	8.78*** (4.56–16.92)
Sex		
Female	Ref.	Ref.
Male	16.36*** (8.25–32.43)	12.07*** (6.65–21.91)
Marital status		
Married	Ref.	–
Unmarried/Widowed/Separated	1.29 (0.72–2.33)	
Educational status		
Non-Literate	Ref.	–
Primary (Class I–IV)	0.53 (0.22–1.29)	
Secondary (Class V–X)	0.52 (0.24–1.12)	
Higher secondary & above (Class XI+)	1.22 (0.30–4.98)	
Occupational types		
Daily wage earners	Ref.	Ref.
Business / Service / Pensioner	0.76 (0.30–1.90)	0.68 (0.29–1.56)
Household worker	0.44* (0.21–0.93)	0.39** (0.20–0.76)
Student / Unemployed / Aged dependent	0.64 (0.19–2.16)	0.98 (0.38–2.53)
Economic condition (Median value of wealth index)		
Low (<-0.0673)	Ref.	–
High (≥ -0.0673)	0.74 (0.39–1.43)	
$\mathbf{R^2}$ (Nagelkerke)	**0.49**	**0.48**

Characteristics	Multivariate	Backward stepwise
Model correctly predicted	**80.0%**	**79.4%**

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; Ref.: reference category

Table 6 reveals the mean differences in health traits between alcohol drinkers and non-drinkers. Alcohol drinkers as a group showed lower mean body fat percentage (t = 5.99; $p < .001$) and higher systolic and diastolic blood pressure than the non-drinker group. Waist circumference was slightly higher among alcohol drinkers than non-drinkers, but the difference was not statistically significant.

Table 6: Mean differences in health traits between alcohol drinkers and non-drinkers

Health variables	Alcohol Drinker			Alcohol Non-drinker			t-value	*p*-value
	N	Mean	SD	N	Mean	SD	(df=473)	
Body Mass Index (kg/m^2)	171	21.57	3.71	304	21.85	3.67	0.808	0.419
Body Fat percentage (%)	171	25.40	7.94	304	29.44	6.51	**5.989**	<0.001
Waist Circumference (cm)	171	78.75	10.82	304	76.82	10.26	1.932	0.054
Systolic Blood Pressure (mmHg)	171	136.22	18.62	304	125.13	16.46	**6.723**	<0.001
Diastolic Blood Pressure (mmHg)	171	86.54	10.15	304	80.31	9.48	**6.701**	<0.001
Pulse rate (Beats/min)	171	74.04	5.22	304	74.21	6.52	0.302	0.763

Table 7 depicts the distribution of the study participants according to selected health trait categories and alcohol drinking status. We first observe that both drinkers and non-drinkers in this population tend to be overweight and a certain percentage of them classified as underweight and therefore presumably malnourished. At the same time, they have a high prevalence of hypertension. There is a major difference in hypertension between drinkers and non-drinkers, and less striking differences in body fat percentage and waist circumference.

Table 7: Distribution of study participants according to health trait categories and alcohol drinking status and its association

Health traits	Alcohol drinker		Alcohol non-drinker		χ^2 value / *p*-value
	No.	%	No.	%	
Nutritional status					
Underweight	36	21.1	52	17.1	1.13 / 0.568
Normal weight	79	46.2	147	48.4	(df=2)
Overweight/obese	56	32.7	105	34.5	
Hypertension category					
Normal	17	9.9	100	32.9	**51.85** / <0.001
Pre-hypertension	69	40.4	137	45.1	(df=3)
Stage-1 hypertension	58	33.9	47	15.5	
Stage-2 hypertension	27	15.8	20	6.6	
Body fat percentage category					
Normal	112	65.5	226	74.3	**4.17** / 0.045
Not normal	59	34.5	78	25.7	(df=1)
Waist circumference category					
Normal	137	80.1	215	70.7	**5.03** / 0.029
Not normal	34	19.9	89	29.3	(df=1)

Multivariate logistic regression analysis was conducted to determine whether alcohol consumption is significantly associated with selected health traits. The regression models showed that alcohol consumption is not significantly associated with these selected health traits once other variables are controlled. The tables are presented in the Appendix for reference.

4 Discussion

High prevalence of alcohol drinking is reported among indigenous people worldwide and also in India among Scheduled Tribes, who regarded traditional alcoholic beverages as inseparable part of their custom and tradition. Alcohol abuse is associated with ill-health conditions, but the data is limited for indigenous people. Inadequacy of data and knowledge remains a reason for lack of effective control measures. In our study we hypothesised that alcohol consumption of indigenous people is determined by their demographic and socio-economic conditions and that drinker and non-drinker groups differ significantly in selected health traits. Accordingly, this study explored the alcohol drinking habit, its demographic and socio-economic determinants, and differences in selected health traits between drinkers and non-drinkers among the Oraons of West Bengal, India.

The findings reveal 36% of individuals consume alcoholic beverage (*Handia*) currently; of whom around 22% consume it daily. A notable percentage of the drinkers consume more than 200 ml of Handia at a time and they are continuing the habit for more than 15 years. Males and those being more than 30 years old are more likely to consume alcohol than their respective counterparts, whereas household workers, which mostly are women, were less likely to consume alcohol. Alcohol drinkers had significantly higher mean blood pressure than non-drinkers. Most associations of selected health traits with alcohol drinker and non-drinker groups were statistically significant in χ^2 association, however, in multivariate and multinomial regression the association is non-significant. The study suggests that mainly males were addicted to alcoholic beverages, yet their alcohol consumption habit is not directly affecting their health status. Demographic and socio-economic status play notable roles in determining both alcohol consumption and selected health traits. It nevertheless seems that awareness generation regarding harmful effects of excessive alcohol use is required. This would not only contribute towards health and wellbeing of the indigenous groups, but can also help to eradicate economic backwardness of these groups by involving more people in income generation and leaving more money to families. It also will help in reducing medical costs of alcohol-related health hazards.

4.1 Prevalence of alcohol drinkers

The findings reveal that 36% of individuals consume alcoholic beverages currently. Far more men than women consume it. A slightly higher percentage of rural people than urban people consume alcoholic beverages. The finding corroborates the findings of NFHS-5, but the prevalence in NFHS-5 is lower than in the present study for both Scheduled Tribes and others. The percentage of drinkers in the present study is higher than reported for other ST groups across India (Debbarma et al., 2023; Kumar & Tiwari, 2017; Sadath et al., 2022; Tomar et al., 2016); but lower than for tribal adolescents of West Bengal (P. Das et al., 2026). Using data of NFHS-4, the findings of Balasubramani et al. (2021) reveal north-east, eastern peninsular and southern states as hot spots of alcohol consumption, where males and STs consume alcohol more. The trend continued for NFHS-5 too. The results of the present study fit into this pattern. It seems that special strategies are required for the people of the region, especially for indigenous communities, to lower the prevalence of problematic alcohol use.

4.2 Alcohol consumption habit and its demographic and socio-economic determinants

The prevalence of alcoholic beverage consumption is higher for aged people, for the married and the non-literate, and for daily wage earners with lower income. Multivariate logistic regression shows males and those being more than 30 years old are more likely to consume alcoholic beverages than their respective counterparts whereas household workers are less likely to consume alcoholic beverages. Also some other studies (Balasubramani et al., 2021; Debbarma, 2019; Rose et al., 2021) among indigenous groups of eastern and southern India reported associations of alcohol consumption with demographic and socio-economic factors.

To lower the prevalence of alcohol consumption, it is required to explore the behaviour associated with it. In the study, notable percentages of the drinkers were daily drinkers and/or had consumed alcohol for fifteen years and above. Peer influence has been reported as a major cause to drink alcohol. The participants did not view media influence as a motivator to start drinking, they rather learned about the ill effect of alcohol drinking through the media. Many of them reported to continue the habit because of addiction. Other studies also reported peer pressure, as well as home and parental support, as motivator to start and continue alcohol consumption among indigenous groups (Debbarma et al., 2023; Sadath et al., 2019), thus corroborating the findings of the present study. Mohindra et al. (2011) opined that an array of social and economic factors which are rooted in historical oppression and social

discrimination are associated with alcohol consumption of indigenous groups, and the present study supports these notions. The findings indicate that anti-alcohol campaigns through mass media will not be very effective for indigenous people. They more likely require involvement of community leaders and influential persons within the group.

Some other observations and assumptions may be beneficial to suggest fruitful ways to combat alcohol abuse. As in other indigenous groups, alcohol use is customary during rituals and in social gatherings of the Oraon. For example, it is customary to share alcoholic beverages between the parents of a newly wed couple. Some drinkers may use such occasions to excuse their drinking. However, some individuals consume alcoholic beverages beyond this customary practice. In this group, alcoholic beverages are used as a remedy to increase the energy level of agricultural workers; to relieve body pain after manual work for agricultural workers and increase comfort for day labourers involved in cleaning municipal areas. Thus, many youngsters get exposed to alcohol consumption in their home at a young age. They get ample opportunity to start consuming alcohol at home, during social and ritual gatherings, and also as an easy remedy to get rid of body pain. The tradition and custom of the group do not forbid them from consuming it. Likewise, aged people do not have enough motivation to quit the habit, and females excuse their alcohol use as a way to welcome relatives, for ritual activity, and as home remedy for certain illnesses. These conjectures are supported by our findings that males and older individuals are more likely to consume alcohol, whereas household workers are less likely to consume alcohol. This points to the kinds of people who should be targeted for interventions.

The traditional alcoholic beverage of the studied group is rice beer known as *Handia*. It is widely believed that locally prepared *Handia* is good for health as it contains nutrients which provide energy and keep the body cool. Scholars too reported nutritive value of rice beer (S. Das & Khan, 2023; Panda et al., 2014). The present study did not examine the alcohol content and nutritive value of the alcoholic beverages. However, it was observed that because the alcohol content of *Handia* is low, distillation was done with indigenous methods to increase the alcohol percentage (Saha et al., 2015). Instead of rice, low grade molasses was used to prepare easily available and cheap alcoholic beverages termed *Chullu* or *Cholai* (Chowdhury et al., 2006) for habitual drinkers. Other studies too supported this notion (Rose et al., 2015). It seems that awareness programmes should explain the risk of preparing alcoholic beverages from low-grade and unsafe materials.

4.3 Differences in selected health traits between alcohol drinkers and non-drinkers

In the study, alcohol drinkers have significantly lower mean values for body fat percentage but significantly higher mean systolic and diastolic blood pressure than non-drinkers. The χ^2 association is significant for hypertension, body fat percentage, and waist circumference. However, in multivariate and multinomial regression, the alcohol drinking habit does not figure as a significant determinant of selected health traits, rather certain demographic and socio-economic traits are significant. Other studies have reported significant associations of health traits with alcohol consumption (Chinnaiyan et al., 2025; Hazarika et al., 2024), but the present study cannot find any direct association between health traits and alcohol drinking. The findings rather imply demographic and socio-economic factors as important for both alcohol consumption and health-related traits.

4.4 Suggested measures

An effective strategy is required to control the harmful use of alcohol without hampering the traditions and customs of indigenous people. World-wide experience shows that a cost-effective option is to impose restrictions on alcohol availability, give it bad publicity, raise prices on alcohol by imposing taxes, and to make screening and treatment options widely available for users (SAFER initiatives) (WHO 2019). For indigenous people worldwide, policies that are developed or implemented by community members of that particular community show effectiveness in improving health and social outcomes (Muhunthan et al., 2017). In India with its diverse regions and populations, measures to control alcohol consumption were taken mostly through different States and Union Territories, with predictable variability in outcomes (Balhara et al., 2025; Gururaj et al., 2021). Varied types of alcohol are consumed in the country including distilled country liquor and Indian-made-foreign liquor (Chowdhury et al., 2006), and under-reporting cannot be ruled out.

At this point, the authors of the article propose some initiatives which can be beneficial to control alcohol consumption in the studied group and also in other indigenous groups of the nation. It seems that interventions need to be targeted to young people although most of them consume alcohol only occasionally, to women, and also to older males who have consumed alcohol regularly for years. Awareness needs to be provided in local language so that the marginalised group can understand it easily. It will also attract the masses if the awareness can be given through performance of tribal artists by singing, performing street shows, puppet shows and video shows. Community leaders and persons influential among youths (aka “role models”) can be involved to provide awareness especially to young people. Community health workers and ICDS workers can be involved to provide awareness to women. These women can also be motivated to raise their voice against illegal alcohol production and consumption. Some

sustainable economic alternative is also required for those who prepare alcohol at home. Habitual drinkers need to be made aware of health and social consequences of heavy drinking. Also, rehabilitation centres within reach of the people are required. All these measures can contribute to control of alcohol abuse.

4.5 Conclusion

In sum, the study aimed to explore the prevalence and associated factors for alcohol consumption within an indigenous group, to reveal the prevalence of consumption where demographic, socio-economic, behaviour and tradition all play a role. The strength of the study is that it tries to study the problem holistically and suggests controlling measures accordingly, but its limitation is that it is based on a small number of study participants and explored the problem cross-sectionally. Study of a larger sample and inclusion of other concomitant variables will be able to provide more meaningful insights into the problem.

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Appendix

Table A1: Multivariate logistic regression of hypertension status on socio-demographic characteristics and substance behaviour of the study participants

Socio-demographic characteristics	**Logistic regression models**	
	Multivariate Odds ratio (95% CI)	**Backward stepwise** Odds ratio (95% CI)
Age (in years)	1.08*** (1.05–1.10)	1.09*** (1.07–1.11)
Place of living		
Rural	Ref.	Removed on step 7
Urban	1.15 (0.70–1.87)	
Alcohol intake status		
No intake	Ref.	Removed on step 8
Occasional	1.07 (0.58–1.99)	
Weekly	2.77 (0.72–10.71)	
2–5 days / week	2.32 (0.81–6.61)	
Daily	1.39 (0.57–3.39)	
Smoking status		
Non-smoker	Ref.	Removed on step 3
Smoker	1.09 (0.56–2.14)	
Sex		
Female	Ref.	Ref.
Male	2.07* (1.01–4.24)	2.33*** (1.47–3.70)
Marital status		
Married	Ref.	Removed on step 6
Unmarried/Widowed/Separated	1.20 (0.68–2.12)	
Educational status		
Non-literate	Ref.	Removed on step 2
Primary (Class I–IV)	0.78 (0.36–1.69)	
Secondary (Class V–X)	0.79 (0.41–1.53)	
Higher secondary & above (Class XI+)	0.74 (0.17–3.23)	
Occupational types		
Daily wage earners	Ref.	Removed on step 4
Business / Service / Pensioner	1.23 (0.53–2.82)	

Characteristics	Multivariate	Backward stepwise
Household worker	1.24 (0.64–2.38)	
Student / Unemployed / Aged dependent	0.68 (0.18–2.60)	
Economic condition (Median value of wealth index)		
Low (<-0.0673)	Ref.	Removed on step 5
High (≥ -0.0673)	1.06 (0.66–1.70)	
$\mathbf{R^2}$ (Nagelkerke)	**0.33**	**0.32**
Model correctly predicted	**76.4%**	**73.9%**

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; Ref.: reference category

Table A2: Multivariate logistic regression of body fat (normal vs. not normal) status on socio-demographic characteristics and substance use behaviour of the study participants

Socio-demographic characteristics	Logistic regression models	
	Multivariate Odds ratio (95% CI)	**Backward stepwise** Odds ratio (95% CI)
Age (in years)	0.94*** (0.91–0.96)	0.94*** (0.92–0.96)
Place of living		
Rural	Ref.	Ref.
Urban	0.67** (0.29–0.75)	0.47** (0.30–0.75)
Alcohol intake status		
No intake	Ref.	Removed on step 2
Occasional	1.02 (0.54–1.95)	
Weekly	1.02 (0.27–3.76)	
2–5 days / week	2.12 (0.64–7.05)	
Daily	1.45 (0.54–3.89)	
Sex		
Female	Ref.	Removed on step 5
Male	0.69 (0.33–1.44)	
Marital status		
Married	Ref.	Removed on step 4
Unmarried/Widowed/Separated	1.16 (0.65–2.05)	
Educational status		
Non-Literate	Ref.	Removed on step 3
Primary (Class I–IV)	0.69 (0.32–1.50)	
Secondary (Class V–X)	0.78 (0.40–1.54)	
Higher secondary & above (Class XI+)	1.16 (0.30–4.54)	
Occupational types		
Daily wage earners	Ref.	Ref.
Business / Service / Pensioner	0.48 (0.21–1.09)	0.36** (0.18–0.74)
Household worker	0.34** (0.18–0.63)	0.32*** (0.19–0.54)
Student / Unemployed / Aged dependent	0.49 (0.15–1.56)	0.54 (0.20–1.42)
Economic condition (Median value of wealth index)		
Low (<-0.0673)	Ref.	Removed on step 6
High (≥ -0.0673)	1.40 (0.87–2.23)	
$\mathbf{R^2}$ (Nagelkerke)	**0.27**	**0.26**

Characteristics	Multivariate	Backward stepwise
Model correctly predicted	**76.6%**	**75.6%**

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; Ref.: reference category

Table A3: Multivariate logistic regression of waist circumference status (normal vs. not normal) on socio-demographic characteristics and substance behaviour of the study participants

Socio-demographic characteristics	Logistic regression models	
	Multivariate Odds ratio (95% CI)	**Backward stepwise** Odds ratio (95% CI)
Age (in years)	0.98 (0.96–1.01)	0.98* (0.96–1.00)
Place of living		
Rural	Ref.	Ref.
Urban	0.61* (0.37–0.99)	0.63 (0.39–1.01)
Alcohol intake status		
No intake	Ref.	Removed on step 2
Occasional	0.53 (0.26–1.06)	
Weekly	0.34 (0.06–2.01)	
2–5 days / week	0.41 (0.08–1.99)	
Daily	0.50 (0.15–1.69)	
Sex		
Female	Ref.	Ref.
Male	33.38*** (9.64–115.61)	17.81*** (5.98–53.08)
Marital status		
Married	Ref.	Ref.
Unmarried/Widowed/Separated	2.57** (1.37–4.83)	2.45** (1.32–4.57)
Educational status		
Non-Literate	Ref.	Removed on step 3
Primary (Class I–IV)	1.12 (0.45–2.77)	
Secondary (Class V–X)	0.54 (0.27–1.07)	
Higher secondary & above (Class XI+)	0.81 (0.22–2.95)	
Occupational types		
Daily wage earners	Ref.	Ref.
Business / Service / Pensioner	0.16** (0.05–0.52)	0.14** (0.05–0.45)
Household worker	0.54* (0.31–0.96)	0.50* (0.30–0.85)
Student / Unemployed / Aged dependent	0.63 (0.19–2.08)	0.66 (0.22–1.99)
Economic condition (Median value of wealth index)		
Low (<-0.0673)	Ref.	Ref.
High (≥ -0.0673)	1.77* (1.09–2.86)	1.88** (1.18–3.01)
$\mathbf{R^2}$ (Nagelkerke)	**0.29**	**0.27**
Model correctly predicted	**77.7%**	**77.7%**

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; Ref.: reference category

Table A4: Multinomial logistic regression of nutritional status (underweight vs. normal and overweight vs. normal) on socio-demographic characteristics and substance behaviour of the study participants

Socio-demographic characteristics	**Multinomial logistic regression models**	
	Underweight vs. normal Odds ratio (95% CI)	**Overweight vs. normal** Odds ratio (95% CI)
Age (in years)	1.01 (0.99–1.04)	1.01 (0.99–1.03)
Place of living		
Rural	1.41 (0.37–0.99)	0.64* (0.41–0.99)
Urban	Ref.	Ref.
Alcohol intake status		
No intake	0.63 (0.25–1.63)	1.12 (0.39–3.24)
Occasional	0.78 (0.30–2.00)	1.45 (0.52–4.08)
Weekly	0.26 (0.03–2.48)	1.85 (0.45–7.71)
2–5 days / week	0.27 (0.05–1.47)	1.89 (0.53–6.69)
Daily	Ref.	Ref.
Sex		
Male	1.05 (0.50–2.22)	0.65 (0.32–1.32)
Female	Ref.	Ref.
Marital status		
Married	0.67 (0.36–1.25)	1.12 (0.65–1.93)
Unmarried/Widowed/Separated	Ref.	Ref.
Educational status		
Non-Literate	1.94 (0.39–9.73)	0.54 (0.18–1.69)
Primary (Class I–IV)	1.51 (0.28–8.14)	0.70 (0.22–2.23)
Secondary (Class V–X)	1.19 (0.27–5.13)	0.67 (0.26–1.74)
Higher secondary & above (Class XI+)	Ref.	Ref.
Occupational types		
Daily wage earners	1.07 (0.30–3.89)	0.91 (0.32–2.54)
Business / Service / Pensioner	0.54 (0.11–2.74)	1.90 (0.61–5.94)
Household worker	0.93 (0.24–3.58)	1.97 (0.69–5.64)
Student / Unemployed / Aged dependent	Ref.	Ref.
Economic condition (Median value of wealth index)		
Low (<-0.0673)	1.23 (0.73–2.09)	0.71 (0.46–1.11)
High (≥ -0.0673)	Ref.	Ref.
$\mathbf{R^2}$ (Nagelkerke)	**0.15**	

Note: * $p < .05$; Ref.: reference category