ORIGINAL RESEARCH ARTICLE

Prevalence and Associated Factors of Hazardous Alcohol Use among Narikkuravar Men in Tirunelveli District, Tamil Nadu, India: A Cross-Sectional Study

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ABSTRACT

Background: Alcoholism is a major threat to the health and social well-being of Scheduled Tribes. Narikkuravars in Tamil Nadu face poverty, low health literacy, and limited healthcare access, predisposing them to hazardous drinking. The study assessed the occurrence of hazardous drinking and its associated drivers among Narikkuravars of Tirunelveli.

Methodology: A community-based cross-sectional study took place between August 2024 and July 2025 among 240 Narikkuravar men aged ≥15 years in Tirunelveli, using probability-proportional-to-size sampling. A structured questionnaire containing the PHQ-9 and WHO AUDIT was used to collect data, while SPSS version 25 was used to perform chi-square tests and binary logistic regression.

Results: In total, 67.1% scored ≥8 on the AUDIT, with 30.4% hazardous drinkers (8-15) and 36.7% having likely dependence (≥16). Marriage (AOR 26.64; 95% CI 2.49-284.96), tobacco consumption (AOR 5.48; 95% CI 2.19-13.71), and mild depressive symptoms (AOR 6.02; 95% CI 1.04-34.78) were significant independent predictors of an AUDIT score ≥8.

Conclusions: Hazardous or dependent alcohol use (AUDIT ≥8) among Narikkuravars was higher than national averages and associated with tobacco use and depressive symptoms, suggesting the need for integrated tribal interventions focusing on literacy, dual substance cessation, mental health support, and AUDIT-based screening.

Key-words: Alcohol Use Disorder, Depressive Disorder, Social Determinants of Health, Tobacco Use Disorder, Tribal Health, Scheduled Tribes

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Introduction

Globally, alcohol misuse remains a leading contributor to avoidable mortality and the overall burden of disease. The World Health Organisation (WHO) estimates that the harmful use of alcohol accounts for 4.7% of all worldwide deaths, along with significant disability-adjusted life years lost and approximately 2.6 million deaths annually. The health burden of hazardous drinking falls more heavily on low- and middle-income countries. This is often linked to weaker health systems, poor regulation, and underlying socioeconomic vulnerability.[1]

In many developing countries like India, harmful use of alcohol overlaps with poverty, psychological distress, domestic violence, and accidents, forming a complicated public health challenge that extends far beyond personal choices towards broader social harm. India is one of the fastest-growing alcohol markets in the world, and the consumption is being observed to increase across age groups and socioeconomic classes. According to findings from the fifth cycle of the National Family Health Survey (NFHS-5), nearly one-fifth of the male population in India aged 15 and older reported alcohol consumption.[2] Evidence from national epidemiological reviews further confirms the unequal distribution of alcohol-related harm across India. Studies indicate that people from disadvantaged and tribal backgrounds tend to drink more heavily, often due to socioeconomic stressors, cultural norms, or easy access to locally brewed liquor.[3] Among the Scheduled Tribes of South India, alcohol consumption is higher among those who've faced long-term exclusion, landless communities, with male drinking linked to social discrimination and poor economic status.[4] A study from a Scheduled Tribe population in Tamil Nadu reported that 29% of adult male drinkers had hazardous alcohol use, and the WHO reports consistently show that alcohol-related harms are disproportionately higher among poorer and marginalised populations compared with the national averages.[5,6]

The Narikkuravars are a semi-nomadic and socially vulnerable community in Tamil Nadu. In 2023, the Constitution (Scheduled Tribes) Order, 1950 was amended to include them in the list of Scheduled Tribes for the State of Tamil Nadu.[7] Historically known as "jackal hunters" (nari = jackal, kuravar = people), the Narikkuravar were labelled as "criminal by birth" under the colonial Criminal Tribes Act of 1871, which led to surveillance, forced settlement, and enduring stigma and marginalisation. Formally denotified in 1952 following the repeal of the Criminal Tribes Act, the Narikkuravar community continues to experience enduring stigma and marginalisation as a legacy of colonial criminalisation. The Narikkuravar community in Tamil Nadu follows a semi-nomadic lifestyle, relying on itinerant livelihoods such as bead selling and small-scale trade, which limits their access to stable housing, education, and healthcare.[8] These socio-economic hardships generate sustained psychosocial stress, a factor identified as significantly increasing susceptibility to substance use and related disorders.[9] Despite limited qualitative research studies indicating heavy tobacco use and possible widespread alcohol consumption in related gypsy tribes,[10] there has been no systematic population-based research with validated tools. The lack of comprehensive data on tribal health limits evidence-based planning and implementation of appropriate health services for tribal populations.[11]

To address this gap, the present study used the Alcohol Use Disorders Identification Test (AUDIT) to measure the extent of hazardous and dependent alcohol consumption (defined as AUDIT ≥8) among Narikkuravar men in the Tirunelveli district.[12,13] The study also evaluated how hazardous alcohol use relates to socio-demographic characteristics like age, marriage, education, earnings, employment, and living conditions. In addition, we examined behavioural (tobacco use and family history of alcoholism), psychosocial factors (depression scores via Patient Health Questionnaire [PHQ-9],[14] perceived community stigma, cultural drinking practices), and environmental aspects like the proximity of alcohol outlets to home or work.

Methodology

Study Design and Setting: A cross-sectional design was utilised for this community-based study. Following ethical approval in June 2024, the research was conducted over a one-year period from August 2024 to July 2025. The study took place across three Narikkuravar settlements in the Tirunelveli district of Tamil Nadu: Pettai, South Vagaikulam, and Valliyur. The study design was chosen to estimate the prevalence of hazardous alcohol use and to explore its association with demographic, behavioural, environmental, and psychosocial determinants in the Tirunelveli district of Tamil Nadu.

Sample size and Sampling Technique: Using the reported 29% prevalence of hazardous alcohol use in tribal male populations as reported by Rose A et al.,[5] the sample size was estimated with 6% absolute precision and 95% confidence intervals, using the Dobson formula $n = Z^2pq/d^2$. To account for a 10% non-response rate, the initial sample of 220 was increased, resulting in a final requirement of 240 participants.

Probability proportional to size was applied to sample the three settlements: Pettai (138), South Vagaikulam (58), and Valliyur (44). At the settlement level, households were selected using a random walk approach; however, this method is recognised as a non-probability sampling technique with potential for selection bias and differs from current WHO recommendations for probability-based sampling.[15] Each survey began from the settlement leader's house, from where a random direction was chosen. The first

household in that direction was selected, followed by consecutive households in the same direction until the target sample size was reached. If a selected household did not contain an eligible male participant (aged ≥15 years), the next household in the same direction was approached. In households with more than one eligible participant, all eligible members were included to ensure adequate coverage and to achieve the required sample size.

Inclusion and Exclusion criteria: Narikkuravar males aged 15 years and older who had lived in the settlement for at least six months were included. Individuals who refused to participate, were unable to answer due to cognitive impairment, or were intoxicated at the time of the visit were excluded. Prior to the data collection phase, we secured written Informed Consent from every participant.

Study tools: Data were gathered using a pre-tested questionnaire delivered via interviewers, capturing participant background (age, marital status, education, occupation), financial status (income and debt), behavioural patterns (tobacco use and family history of alcoholism), environmental factors (alcohol availability), and psychosocial factors (perceived cultural acceptance, community stigma, depressive symptoms). To measure alcohol availability, participants were asked if alcohol could be easily obtained in their locality. Perceived cultural acceptance was determined by asking if they consumed alcohol as part of their cultural or traditional practices, while community stigma was assessed by asking if they felt any discrimination due to their alcohol use. All three questions had dichotomous response options (yes/no).

The study utilised the Tamil-validated version of the AUDIT. This 10-item screening tool demonstrated strong reliability, with a Cronbach's alpha of 0.89.[12,13] The assessment covers three domains: consumption, dependence, and alcohol-related problems. Scores range from 0 to 40; a score of 8-15 signifies hazardous use, and 16+ indicates dependence. For analytical purposes, AUDIT ≥8 was defined as the primary binary outcome variable, combining hazardous use and dependence. To ensure sufficient statistical power for regression analysis and to identify individuals at risk for alcohol use disorders, we utilized this specific threshold. Depressive symptoms were measured based on DSM-IV criteria using a Tamil-validated PHQ-9, which showed high internal consistency (Cronbach's alpha = 0.86).[14] Participants scored 0-3 on nine items, resulting in a 0-27 range. Severity was defined as none (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), or severe (20-27).

Data collection procedure: The study was carried out between August 2024 and July 2025. The initial phase included designing the questionnaire, pilot testing, census listing, and coordinating logistics. The household survey was conducted over a short field period in June and July 2025. A pilot study with 20 participants from a separate Narikkuravar settlement resulted in minor refinements to the questionnaire. To ensure consistency, these pilot results were not incorporated into the final dataset. The principal investigator conducted face-to-face interviews in Tamil with eligible participants across the three Narikkuravar settlements, identified through community listing and door-to-door visits. Written Informed Consent was secured after participants were informed of the study's procedures, data privacy, and voluntary participation. For minors aged 15-17 years, Assent was obtained along with consent from a parent or guardian. Interviews were conducted in private settings, and responses were initially recorded on paper before being entered into an Excel spreadsheet for data management. Efforts were made to minimise potential sources of bias during data collection. Recall bias related to family history of alcoholism was reduced by asking participants about alcohol use among close family members using simple and clearly worded questions. Interviews took place in private to ensure accuracy and limit social pressure. To further protect the integrity of the data, we assured every participant of the confidentiality of their responses. We mitigated selection bias by implementing a systematic door-to-door survey strategy across all selected settlements. If an eligible male participant was not present at the time of the visit, the next household in the sequence was approached to continue sampling.

Ethical Considerations: The study was approved by the Institutional Human Ethics Committee of Sree Balaji Medical College and Hospital on 25 June 2024. (Ref. No. 002/SBMCH/IHEC/2024/2235). Conducted between August 2024 and July 2025, the study adhered to the ICMR guidelines for biomedical research. Written Informed Consent was obtained only after a full explanation of the study's objectives and confidentiality protocols. Each participant was assured that their involvement was voluntary and that they maintained the right to withdraw at any stage. Participants with AUDIT scores ≥16 or PHQ-9 scores ≥5 were referred to de-addiction or mental health services at the closest primary health centre or district hospital.

Statistical analysis: Data were organised in Microsoft Excel 2024 and exported to IBM SPSS (Version 25) for statistical processing. Categorical data were described using frequencies and percentages, utilizing Pearson's chi-square test to identify associations with hazardous or dependent alcohol use (AUDIT ≥8). Significant factors ($p < 0.05$) were then included in a multivariable binary logistic regression model (Enter method) to calculate adjusted odds ratios (AOR) and 95% confidence intervals (CI). For the multivariable analysis, tobacco use was recorded as a binary variable (any tobacco uses vs. none) by combining smoked and smokeless forms to avoid small cell counts. Due to the limited sample size of individuals with secondary schooling (n = 7), educational attainment was reclassified as a binary variable (primary education or less vs. secondary education).

Model performance was examined via the Hosmer-Lemeshow goodness-of-fit test and Nagelkerke R^2 values to ensure robust statistical estimation. Multicollinearity among predictors was examined using the variance inflation factor, with a VIF <5 considered acceptable. Results were defined as significant if two-tailed p-values were <0.05.

Results

The analysis included all 240 participants, resulting in a full response rate. The participants had a mean age of 32.8 years (SD ± 12.3), with ages spanning from 15 to 68 years.

The socio-demographic and behavioural characteristics of the participants are summarised in Table 1. Most respondents were married (95.4%) and belonged to lower socioeconomic groups (62.5%) according to the Modified BG Prasad classification.[16] Nearly all participants (97.1%) had an educational background below the secondary level. High rates of tobacco use (76.7%) were observed, alongside a report from 78.3% of respondents that alcohol was readily available in their communities.

As shown in Table 2, 67.1% of participants scored ≥8 on the AUDIT, representing the primary outcome of hazardous or dependent alcohol consumption. Among the 240 participants, 35 (14.6%) were abstainers (AUDIT = 0), 44 (18.3%) consumed alcohol at low risk (AUDIT 1-7), 73 (30.4%) were classified as hazardous users (AUDIT 8-15), and 88 (36.7%) met the criteria for alcohol dependence (AUDIT ≥16).

Bivariate analysis (Table 3) revealed that hazardous alcohol consumption (AUDIT ≥8) was significantly linked to marital status, location, and educational attainment, as well as behavioural factors like tobacco use and family history of alcoholism. Clinical predictors, including depressive symptoms and perceived community stigma, also showed significant relationships. Participants reporting stigma had lower odds of hazardous alcohol use, at 0.45 (95% CI: 0.21-0.96, p = 0.037), indicating an inverse association. In contrast, variables such as age, household income, debt, and perceived alcohol availability failed to reach statistical significance (p > 0.05).

Significant bivariate correlates were entered into a multivariable binary logistic regression model (Table 4). After adjusting for potential confounders, marital status emerged as a strong predictor of hazardous alcohol use (AOR = 26.64; 95% CI: 2.49-284.96; p = 0.007), though the small number of unmarried participants resulted in a wide confidence interval. Tobacco use in any form (AOR = 5.48; 95% CI: 2.19-13.71; p <0.001) and mild depressive symptoms (AOR = 6.02; 95% CI: 1.04-34.78; p = 0.045) also remained significant independent predictors. Conversely, variables such as location, education, family history, and perceived stigma did not retain significance in the adjusted model. The regression model explained 48.3% of the variance (Nagelkerke R^2 = 0.483), with the Hosmer-Lemeshow test suggesting a borderline fit (χ^2 = 16.15, df = 8, p = 0.040).

Table 1: Socio-demographic, behavioural and psychosocial characteristics of Narikkuravar men (N=240)

Variable	Subjects(%)
Age (years)	
15-30	101 (42.1)
31-45	110 (45.8)
≥46	29 (12.1)
Marital status	
Married	229 (95.4)
Unmarried	11 (4.6)
Location	
Pettai	138 (57.5)
South Vagaikulam	58 (24.2)
Valliyur	44 (18.3)
Occupation	
Bead selling	97 (40.4)
Fancy items	62 (25.8)
Honey selling	42 (17.5)
Tattooing	39 (16.3)
Monthly family income (₹)	
≤5000	103 (42.9)
5001-10,000	84 (35)
10,001-15,000	37 (15.4)
>15,000	16 (6.7)
Socio-economic status (Modified BG Prasad)	
Lower	150 (62.5)
Lower middle	74 (30.8)
Middle	16 (6.7)
Type of house	
Semi-pucca	82 (34.2)
Pucca	158 (65.8)
Educational status	
Illiterate	118 (49.2)
Literate (no formal education)	45 (18.8)
Primary completed	70 (29.2)
Secondary completed	7 (2.9)
Family history of alcoholism	229 (95.4)
Tobacco use	
Smoked	112 (46.7)
Smokeless	72 (30)
None	56 (23.3)
Having financial Debt	110 (45.8)
Cultural acceptance of alcohol use	40 (16.7)
Stigma of alcohol use within community	49 (20.4)
Alcohol available near home/workplace	188 (78.3)
Depression (PHQ-9)	
None (0-4)	209 (87.1)
Mild (5-9)	31 (12.9)

PHQ-9: Patient Health Questionnaire-9

Table 2: Distribution of alcohol use patterns based on AUDIT categories (N=240)

AUDIT category	AUDIT score	Participants (%)
Abstainer	0	35 (14.6)
Low risk	1-7	44 (18.3)
Hazardous use	8-15	73 (30.4)
Dependence	≥16	88 (36.7)
AUDIT ≥8	8-40	161 (67.1)

AUDIT: Alcohol Use Disorders Identification Test

Table 3: Bivariate analysis of factors associated with hazardous/harmful alcohol use among Narikkuravar men (AUDIT ≥8) (N=240)

Variable	AUDIT ≥8 (n=161)	AUDIT <8 (n=79)	OR (95% CI)	p-value
Age (years)				
15-30	68 (67.3)	33 (32.7)	1.12 (0.47-2.68)	0.802
31-45	74 (67.3)	36 (32.7)	1.05 (0.44-2.49)	0.907
≥46	19 (65.5)	10 (34.5)	Reference	-
Married (Ref Unmarried)	160 (69.9)	69 (30.1)	23.19 (2.91-184.67)	<0.001‡
Location				
Pettai	105 (76.1)	33 (23.9)	3.92 (2.05-7.49)	<0.001‡
Valliyur	30 (68.2)	14 (31.8)	2.64 (1.16-5.98)	0.019*
South Vagaikulam	26 (44.8)	32 (55.2)	Reference	-
Monthly income (₹)				
≤5000	69 (67.0)	34 (33.0)	0.29 (0.06-1.35)	0.143
5001-10000	53 (63.1)	31 (36.9)	0.24 (0.05-1.15)	0.081
10001-15000	25 (67.6)	12 (32.4)	0.30 (0.06-1.52)	0.183
>15000	14 (87.5)	2 (12.5)	Reference	-
Socio-economic status (Modified BG Prasad)				
Lower	96 (64.0)	54 (36.0)	0.94 (0.28-3.12)	1.000
Lower middle	53 (71.6)	21 (28.4)	0.84 (0.24-2.91)	1.000
Middle	12 (75.0)	4 (25.0)	Reference	-
Type of house Semi pucca (Ref Pucca)	59 (72.0)	23 (28.0)	1.41 (0.79-2.52)	0.250
Educational status				
Illiterate	80 (67.8)	38 (32.2)	12.63 (1.47-108.65)	0.008†
Literate (no formal education)	26 (57.8)	19 (42.2)	8.21 (0.91-73.96)	0.046*
Primary completed	54 (77.1)	16 (22.9)	20.25 (2.27-180.82)	0.002†
Secondary completed	1 (14.3)	6 (85.7)	Reference	-
Family history of alcoholism (Ref - No)	159 (69.4)	70 (30.6)	10.22 (2.15-48.53)	<0.001‡
Tobacco use				
Smoked	99 (88.4)	13 (11.6)	22.85 (9.89-52.75)	<0.001‡
Smokeless	48 (66.7)	24 (33.3)	6.00 (2.75-13.07)	<0.001‡
None	14 (25.0)	42 (75.0)	Reference	-
Having Debt (Ref – No debt)	71 (64.5)	39 (35.5)	0.81 (0.47-1.39)	0.440
Cultural acceptance of alcohol use (Ref – No)	25 (62.5)	15 (37.5)	1.28 (0.63-2.58)	0.500
Stigma of alcohol use within community (Ref No)	39 (79.6)	10 (20.4)	0.45 (0.21-0.96)	0.037*
Alcohol available near home/workplace (Ref – No)	128 (68.1)	60 (31.9)	1.29 (0.65-2.34)	0.530
Depression (PHQ-9 – Mild 5-9) (Ref None 0-4)	29 (93.5)	2 (6.5)	8.46 (1.96-36.43)	0.001†

Note: Data presented as n (%). Percentages are row percentages within each exposure category, showing the proportion of AUDIT ≥8 and <8. *Statistically significant at p<0.05, †Statistically significant at p<0.01, ‡Statistically significant at p<0.001. AUDIT: Alcohol Use Disorders Identification Test (score ≥8 indicates hazardous or harmful alcohol use); CI: confidence interval; OR: odds ratio; PHQ-9: Patient Health Questionnaire-9.

Table 4: Multivariable logistic regression analysis of determinants of hazardous/harmful alcohol use among Narikkuravar men (AUDIT ≥8) (N=240)

Variable	AOR (95% CI)	p-value
Marrried (vs Unmarried)	26.64 (2.49-284.96)	0.007†
Location Pettai/Valliyur (vs South Vagaikulam)	2.49 (0.92-6.75)	0.074
Educational status primary or below (vs Secondary completed)	5.84 (0.53-64.44)	0.150
Family history of alcoholism (vs No)	5.10 (0.64-40.98)	0.125
Tobacco use (any form vs none)	5.48 (2.19-13.71)	<0.001‡
Stigma of alcohol use within community (vs No)	1.05 (0.40-2.76)	0.927
Mild Depression (PHQ-9) (vs None)	6.02 (1.04-34.78)	0.045*

Note: Education categories were collapsed for the multivariable model due to small number of participants with secondary education (n=7). Tobacco use was recoded into a binary variable (any form of tobacco use vs. none) by combining smoked and smokeless forms. *Statistically significant at p<0.05, †Statistically significant at p<0.01, ‡Statistically significant at p<0.001. AUDIT: Alcohol Use Disorders Identification Test (score ≥8 = hazardous or harmful alcohol use); AOR: adjusted odds ratio; CI: confidence interval; PHQ-9: Patient Health Questionnaire-9.

Discussion

By employing a validated screening tool, the current study offers the first evidence-based assessment of alcohol use disorders (AUDIT ≥8) among men in the Narikkuravar community. More than two-thirds of participants (67.1%) scored at or above the AUDIT threshold for hazardous or harmful use, with a substantial share (36.7%) meeting criteria for likely dependence. These figures markedly exceed rates reported among Jawadhi hills tribal men in Tamil Nadu,[5] pointing to a considerably heavier burden within this community and underlining the need for targeted public health action.

The prevalence observed in the present study is comparable to patterns reported among tribal communities in Dhule, Maharashtra, and Cuttack, Odisha, where hazardous alcohol use (AUDIT > 8) has been reported at 66.7% and 44.8%, respectively.[6] These results also mirror community-level data obtained from the Dakshin Kannada district in Karnataka.[17] However, the higher proportion of participants showing likely alcohol dependence in the present study suggests more established drinking patterns that may be associated with social disadvantage and limited access to support services. These elevated prevalence rates potentially reflect the unique social and structural stressors experienced by the Narikkuravar community. Factors such as persistent socioeconomic marginalisation, geographic isolation, and the normalisation of alcohol consumption within familial environments may be associated with these findings.

Married men had nearly 27 times the adjusted odds of hazardous drinking compared with their unmarried counterparts. This aligns with findings from Adivasi and other tribal communities, where financial pressures and social role expectations have been linked to higher drinking rates.[18,19] That said, the association must be read carefully: only 11 unmarried men were included, and the confidence intervals were correspondingly wide. Education, though strongly associated in bivariate analysis, did not survive adjustment, a pattern also observed in Dakshina Kannada (OR 4.11) and rural West Bengal,[17,20] likely because its influence is mediated through proximal behavioural and social pathways rather than acting as an independent associated factor. Even so, lower literacy may be associated with reduced health awareness and limited livelihood options, indirectly maintaining conditions in which harmful drinking remains prevalent.

Tobacco use was among the strongest and most consistent predictors, remaining significant even after full adjustment. This is biologically plausible, as prior evidence shows that nicotine reinforces alcohol's rewarding effects through mesolimbic dopaminergic pathways,[21] and the high rate of co-use in this population underscores an urgent need for integrated cessation approaches. Evidence for combined tobacco-alcohol interventions in Indian tribal settings remains limited,[22-24] making this an important gap for future programmatic work. Family history of alcoholism was nearly universal in the study population, and as a result, it did not function as a meaningful discriminator in the multivariable model (AOR 5.10; 95% CI: 0.64-40.98; p = 0.125). This should not be taken as evidence of no effect. When almost every participant shares the same exposure, statistical models cannot meaningfully separate those at higher versus lower familial risk. The biological and social plausibility of intergenerational transmission remains intact,[25,26] and tribal studies confirm that exposure to alcohol use within the household is associated with increased likelihood of alcohol consumption among adolescents.[27] Studies in settings with more variation in family drinking history would be better placed to quantify this relationship.

Depression was a significant independent predictor even at mild symptom severity (AOR 6.02; 95% CI: 1.04-34.78; p = 0.045), a finding that carries particular clinical weight in a community where psychosocial distress from discrimination, income instability, and marginalisation is well documented.[28] The alcohol-depression relationship is bidirectional: alcohol consumption may sometimes function as a coping behaviour, while chronic use itself worsens depressive states, forming a vicious cycle that neither alcohol programmes nor mental health services can address in isolation. The higher prevalence of hazardous drinking in the locality of Pettai (OR 3.92, p <0.001) did not survive adjustment (AOR 2.49, p = 0.074), suggesting that geographic clustering of tobacco use and depressive symptoms within that locality may explain much of what initially appeared to be a place effect.

Not every anticipated predictor proved significant. Debt, proximity to alcohol outlets, and perceived cultural acceptance of drinking were all unrelated to hazardous use in this sample. Although alcohol has historically featured in community celebrations, only a small fraction of participants viewed drinking as culturally acceptable a possible sign of shifting norms within the community. The inverse relationship between perceived stigma and AUDIT scores observed in the bivariate analysis did not persist after multivariable adjustment (AOR 1.05; 95% CI: 0.40-2.76; p = 0.927), indicating that stigma was not an independent predictor of alcohol misuse. The fact that only 14.6% reported full abstinence, and that more than a third met criteria for likely dependence, suggests that alcohol use is deeply woven into daily life within this community and that it is more closely associated with psychosocial and behavioural factors than with availability or community attitudes. Policies focused solely on restricting supply or raising prices are therefore unlikely to produce lasting change unless they address the mental health vulnerabilities and substance use patterns that are associated with harmful drinking in this population.[29,30]

Strength and Limitations

This study employed probability proportional to size sampling, which improves the representativeness of findings within the selected settlements. The use of validated Tamil versions of the AUDIT and PHQ-9 ensured reliable and contextually appropriate measurement, and the inclusion of socio-demographic, behavioural, and psychosocial variables allowed a comprehensive assessment of factors associated with alcohol use in an understudied tribal population. However, several limitations should be considered. Because this study is cross-sectional, cause-and-effect relationships cannot be established. Despite efforts to mitigate bias through private interviewing,

the reliance on self-reported measures remains an inherent limitation, leaving the data vulnerable to social desirability and retrospective recall errors. Limited variability in certain variables, particularly marital status and family history of alcoholism, may have affected the precision of adjusted estimates. Since the current research focused exclusively on male participants from three specific settlements, the results may not accurately represent the experiences of Narikkuravar women or other indigenous groups. In addition, PHQ-9 is a screening tool rather than a clinical diagnostic instrument. The sample size calculation did not adjust for the design effect of cluster sampling, and the regression model yielded a borderline goodness of fit ($p = 0.040$), suggesting a cautious interpretation of the findings. Additionally, the brief data collection period precluded an assessment of seasonal variations in alcohol consumption.

Recommendations

Strengthen literacy and adult education initiatives to improve health awareness and reduce vulnerability to alcohol-related harm in tribal communities. Routine AUDIT-based screening should be implemented within tribal health services for early detection of hazardous or dependent alcohol use. Combined tobacco and alcohol cessation programs should be integrated, considering the high co-occurrence of these behaviours. Mental health screening and referral pathways should also be incorporated within primary tribal health services to address psychosocial factors associated with alcohol use. In addition, culturally appropriate, community-led harm reduction strategies should be promoted through trained community health volunteers to improve local acceptance and engagement. Comprehensive alcohol control measures consistent with the World Health Organization SAFER framework should also be adopted, including restrictions on alcohol availability, enforcement of drink-driving countermeasures, improved access to treatment services, regulation of alcohol advertising, and increased alcohol taxation.[31]

Conclusion

Hazardous or dependent alcohol use (AUDIT ≥8) was highly prevalent among Narikkuravar men in Tirunelveli district of Tamil Nadu and was independently associated with tobacco use and depressive symptoms. This pattern reveals deep social and behavioural vulnerabilities rooted in historical marginalisation. Addressing this requires culturally tailored, community-based interventions that integrate literacy improvement, dual-substance cessation, mental health support, and social empowerment within tribal populations. Strengthening tribe-sensitive policies may help reduce alcohol-related harm in marginalised communities.

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References

1. World Health Organization. Global Status Report on Alcohol and Health and Treatment of Substance Use Disorders. Geneva: WHO; 2024. Available from: https://www.who.int/publications/i/item/9789240096745 [Accessed on Dec 30, 2025]
2. International Institute for Population Sciences (IIPS); ICF. National Family Health Survey (NFHS-5), 2019-21: India. Mumbai: IIPS; 2022. Available from: https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf [Accessed on Jan 01, 2026]
3. Eashwar VMA, Umadevi R, Gopalakrishnan S. Alcohol consumption in India- An epidemiological review. J Family Med Prim Care. 2020 Jan 28;9(1):49-55. DOI: https://doi.org/10.4103/jfmpc.jfmpc_873_19 PMid:32110564 PMCid:PMC7014857
4. Mohindra KS, Narayana D, Anushreedha SS, Haddad S. Alcohol use and its consequences in South India: views from a marginalised tribal population. Drug Alcohol Depend. 2011 Aug 1;117(1):70-73. DOI: https://doi.org/10.1016/j.drugalcdep.2010.12.021 PMid:21282019
5. Rose A, Mohan VR, Vinodh A, David SM, George K, Minz S, Prasad JH. Hazardous use of alcohol among men in the tribal population of Jawadhi Hills, Tamil Nadu: Nature, prevalence, and risk factors. J Family Med Prim Care. 2021 Jan;10(1):481-484. DOI: https://doi.org/10.4103/jfmpc.jfmpc_1354_20 PMid:34017774 PMCid:PMC8132826
6. Benegal V, Gururaj G, Murthy P, Girish N, Chand P, Jayarajan D, et al. Patterns and consequences of alcohol misuse in India: an epidemiological survey. Bengaluru: National Institute of Mental Health and Neurosciences (NIMHANS); 2012.
7. Government of India. The Constitution (Scheduled Tribes) Order (Second Amendment) Act, 2022 (No. 1 of 2023). Gazette of

India, Extraordinary, Part II, Section 1. New Delhi: Ministry of Law and Justice; 2023 Jan 3.

8. Ayana M. From criminal tribes to denotified communities: the historical trajectories of the Narikkuravar in Tamil Nadu and the Pardhi in Madhya Pradesh. Historicity Res J. 2024;11(2):1-12. Available from: https://oldhistoricity.lbp.world/Administrator/UploadedArticle/1006.pdf

9. Murthy P, Manjunatha N, Subodh BN, Chand PK, Benegal V. Substance use and addiction research in India. Indian J Psychiatry. 2010;52(Suppl 1):S189-199. DOI: https://doi.org/10.4103/0019-5545.69232 PMid:21836677 PMCid:PMC3146212

10. Chellappa LR, Leelavathi L, Indiran MA, Rathinavelu PK. Prevalence and dependency of tobacco use among tribal gypsies in Thoothukudi district - A cross sectional study. J Family Med Prim Care. 2021 Feb;10(2):738-744. DOI: https://doi.org/10.4103/jfmpc.jfmpc_1344_20 PMid:34041070 PMCid:PMC8138420

11. Ministry of Health and Family Welfare, Government of India; Ministry of Tribal Affairs, Government of India. Report of the Expert Committee on Tribal Health: Tribal health in India bridging the gap and a roadmap for the future. Executive summary and recommendations. New Delhi: Government of India; 2018. Available from: https://nhm.gov.in/New_Updates_2018/NHM_Components/Tribal_Report/Executive_Summary.pdf [Accessed on Dec 30, 2025]

12. World Health Organization, Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. AUDIT: the alcohol use disorders identification test: guidelines for use in primary health care. 2nd ed. Geneva: World Health Organization; 2001. Available from: https://www.who.int/publications/i/item/WHO-MSD-MSB-01.6a [Accessed on Jan 13, 2026

13. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption-II. Addiction. 1993 Jun;88(6):791-804. DOI: https://doi.org/10.1111/j.1360-0443.1993.tb02093.x PMid:8329970

14. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. J Gen Intern Med 2001;16(9):606-613. DOI: https://doi.org/10.1046/j.1525-1497.2001.016009606.x PMid:11556941 PMCid:PMC1495268

15. World Health Organization. Vaccination coverage cluster surveys: reference manual. Geneva: World Health Organization; 2018. (WHO/IVB/18.09). Available from: https://iris.who.int/bitstream/handle/10665/272820/WHO-IVB-18.09-eng.pdf

16. Anand A, Mandal I, Hossain S. BG Prasad Scale 2025: An updated framework for socioeconomic assessment in India. Natl J Community Med 2025;16:555-558. DOI: https://doi.org/10.55489/njcm.160520255339

17. Gupta A, Hameed S. Assessment of alcohol use and its associated factors among adults residing in Dakshina Kannada district, Karnataka, India. Int J Community Med Public Health 2024;11(5):1919-1923. DOI: https://doi.org/10.18203/2394-6040.ijcmph20241188

18. Sadath A, Jose K, Meethal ST, Mathai JK, Venugopal AP, Xavier N. Factors associated with alcohol misuse among indigenous tribal men in Wayanad: A qualitative study. Indian J Psychol Med 2019;41(6):516-522. DOI: https://doi.org/10.4103/IJPSYM.IJPSYM_326_19 PMid:31772437 PMCid:PMC6875840

19. Menon G, Mathias P, Wurdeman T, Dahake R, Elamanna J, Pathayakandi KS, et al. Paternal Alcohol Consumption and Childhood Malnutrition: A Community-based Participatory Case-control Study among Adivasis in Rural South India. Indian J Public Health. 2024 Jan 1;68(1):75-82. DOI: https://doi.org/10.4103/ijph.ijph_64_23 PMid:38847637

20. Barik A, Rai RK, Chowdhury A. Alcohol use-related problems among a rural Indian population of West Bengal: An application of the Alcohol Use Disorders Identification Test (AUDIT). Alcohol Alcohol 2016;51(2):215-223. DOI: https://doi.org/10.1093/alcalc/agv097 PMid:26294678

21. Adams S. Psychopharmacology of tobacco and alcohol comorbidity: A review of current evidence. Curr Addict Rep 2017;4(1):25-34. DOI: https://doi.org/10.1007/s40429-017-0129-z PMid:28357192 PMCid:PMC5350203

22. Correa-Fernández V, Díaz-Toro EC, Reitzel LR, Vidrine JI, Velasquez MM, Cinciripini PM, et al. Combined treatment for at-risk drinking and smoking cessation among Puerto Ricans: A randomized clinical trial. Addict Behav 2017;65:185-192. DOI: https://doi.org/10.1016/j.addbeh.2016.10.009 PMid:27825036 PMCid:PMC5358923

23. Sridhar OT, Murthy P, Kishore Kumar KV. Integrated brief tobacco and alcohol cessation intervention in a primary healthcare setting in Karnataka. Indian J Public Health 2017;61(Suppl 1):S29-34. DOI: https://doi.org/10.4103/ijph.IJPH_235_17 PMid:28928316

24. Prochaska JJ, Delucchi K, Hall SM. A meta-analysis of smoking cessation interventions with individuals in substance abuse treatment or recovery. J Consult Clin Psychol. 2004;72(6):1144-1156. DOI: https://doi.org/10.1037/0022-006X.72.6.1144 PMid:15612860

25. Verhulst B, Neale MC, Kendler KS. The heritability of alcohol use disorders: A meta-analysis of twin and adoption studies. Psychol Med. 2015;45(5):1061-1072. DOI: https://doi.org/10.1017/S0033291714002165 PMid:25171596 PMCid:PMC4345133

26. Rossow I, Keating P, Felix L, McCambridge J. Does parental drinking influence children's drinking? A systematic review of prospective cohort studies. Addiction. 2016;111(2):204-217. DOI: https://doi.org/10.1111/add.13097 PMid:26283063 PMCid:PMC4832292

27. War RJ, Gharat VV, Chandramouleeshwaran S, Nayak S, Nimgaonkar VL, Devi S. A Three-Site Study of Alcohol Consumption among Adolescents from Indigenous Tribes in India. Indian J Psychol Med. 2020 Dec;42(6 Suppl):S51-S56. DOI: https://doi.org/10.1177/0253717620969737 PMid:33487803 PMCid:PMC7802039

28. Verma P, Sahoo KC, Mahapatra P, Kaur H, Pati S. A systematic review of community-based studies on mental health issues among tribal populations in India. Indian J Med Res 2022;156(2):291-298. DOI: https://doi.org/10.4103/ijmr.ijmr_3206_21 PMid:36629189 PMCid:PMC10057360

29. Room R, Babor T, Rehm J. Alcohol and public health. Lancet. 2005;365(9458):519-530. DOI: https://doi.org/10.1016/S0140-6736(05)17870-2 PMid:15705462

30. Sharma SR, Matheson A, Lambrick D, Faulkner J, Lounsbury DW, Vaidya A, et al. The role of tobacco and alcohol use in the interaction of social determinants of non-communicable diseases in Nepal: a systems perspective. BMC Public Health. 2020;20(1):1368. DOI: https://doi.org/10.1186/s12889-020-09446-2 PMid:32894104 PMCid:PMC7487957

31. World Health Organization. The SAFER Technical Package: Five Areas of Intervention at National and Sub-National Levels. Geneva: WHO; 2019. Available from: https://www.who.int/publications/i/item/9789241516419 [Accessed on Dec 30, 2025]