

Original Research



Sri Lanka's drinking culture: correlates of alcohol consumption in adult males in the Colombo District

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DOI: <https://doi.org/10.4038/jccpsl.v31i3.8818>

Received on 3 Jan 2025

Accepted on 3 Jul 2025

Abstract

Introduction: Alcohol is a significant global public health issue. Despite a high prevalence of alcohol abstinence in Southeast Asia, the region has some of the highest drinking rates globally. In Sri Lanka, alcohol is linked to major health concerns and poverty. Identifying factors that influence alcohol use will inform effective prevention programmes.

Objectives: To explore the factors linked to alcohol consumption among adult males in Colombo, Sri Lanka

Methods: A community-based cross-sectional study was conducted among 1106 adult males in Colombo District, selected using multi-stage cluster sampling to represent all 13 divisional secretariat divisions. Data were collected by pre-intern medical graduates using a pre-tested interviewer-administered questionnaire. The PRECEDE-PROCEED model was applied to identify factors associated with alcohol consumption between current drinkers and never drinkers. Logistic regression analysis with adjusted odds ratio (AOR) was performed for statistical evaluation.

Results: The study achieved a 95.4% response rate, with participants averaging 45.7 years of age. Non-modifiable socio-demographic factors associated with current drinking were being younger than 45 years of age (AOR: 0.3; 95% CI: 0.2, 0.5), Sinhalese (AOR: 9.7; 95% CI: 2.9, 3.1), being currently married (AOR: 2.4; 95% CI: 1.4, 4.0) and being employed (AOR: 5.9; 95% CI: 3.4, 10.0). Modifiable factors associated with current drinking were being a current smoker (AOR: 4.5; 95% CI: 2.7, 7.4), having unfavourable attitudes (AOR: 5.4; 95% CI: 3.4, 8.6) having unsatisfactory knowledge (AOR: 2.3; 95% CI: 1.5, 3.6) and influence of the family members (AOR: 2.3; 95% CI: 1.3, 4.1).

Conclusions & Recommendations: The findings emphasize the importance of targeted interventions addressing family and peer influence, and integrated strategies for smoking and alcohol prevention.

Key words: Alcohol consumption, PRECEDE-PROCEED model, Sociodemographic factors

Introduction

Alcohol consumption is a significant global health issue, contributing to diseases, accidents and social problems. In Southeast Asia, despite a lifetime abstinence rate of over 50%, alcohol-related deaths in 2016 stood at 36.8 per 100,000 people, with regional alcohol consumption rising to 9.8 l per capita among drinkers (1-2). In Sri Lanka, alcohol-related health concerns are equally pressing, with deaths linked to liver cirrhosis, traffic injuries and cancer contributing to the country's growing burden of non-communicable diseases (3). Alcohol is also a key factor in domestic violence, self-harm, suicide and road accidents in rural areas (4-5).

Factors associated with alcohol consumption have been identified as showing diversity from very narrow individual variables to broader boundaries such as the national and international levels (6). Previous studies have reviewed various global, regional and national surveys to identify factors associated with alcohol consumption. These factors predominantly include sociodemographic aspects and cultural influences (1, 6-7). Research shows that males have higher rates of current and heavy episodic drinking compared to females across different age groups, countries and cultures worldwide (6). Urbanization regardless of income level, has caused higher rates of current drinking and binge drinking among urban residents in contrast to that of rural residents (8-9). In developed countries, higher education and income levels have been associated with increased alcohol consumption (10). However, lower-income groups often exhibit higher rates of binge drinking (11). In countries like India and Sri Lanka, males with relatively low education levels indicate higher rates of current and binge drinking (3). Ethnicity and religion also play significant roles in drinking habits (12). For instance, in Sri Lanka, the Burgher ethnicity and Christian/Catholic faith were associated with higher drinking rates, while Muslim had the lowest rates of alcohol use (13). However, the majority of these associated factors are non-

modifiable. Therefore, it is essential to focus on modifiable factors as well. In literature, models have been introduced to identify modifiable factors of a specific behaviour. The PRECEDE-PROCEED model, an accepted model to conceptualize factors has been used in various studies to identify predisposing, reinforcing and enabling factors (14). It is essential to understand both initiating and maintaining factors associated with alcohol consumption in preventive efforts among adults. The PRECEDE-PROCEED model was used in the present study, which categorizes factors into predisposing (e.g. attitudes), reinforcing (e.g. social norms) and enabling (e.g. access) categories. This framework provides a clearer understanding of what drives both the initiation and maintenance of drinking behaviours, with the goal of informing prevention efforts. The objective of the study was to identify the factors influencing alcohol consumption among adult males in the Colombo district using PRECEDE-PROCEED model.

Methods

A community-based cross-sectional survey was conducted in the Colombo district, Sri Lanka. This district exhibits a diverse blend of ethnicities and socioeconomic backgrounds spread across urban, rural and estate sectors. The study population comprised adult males aged 18 years and above who were residing in the district for at least six months. Exclusion criteria included individuals who were living or working abroad during the study period, those who were hospitalized, jailed, or institutionalized at the time of data collection, those who cannot speak Sinhala language and individuals deemed mentally unfit to participate in the survey.

The sample size was calculated based on the prevalence of current alcohol use (consumption within the last 30 days) among adult males in Sri Lanka, reported as 34.8% in the 2015 STEPS survey; Z value of 1.96; precision of 0.04; and 5% non-

response (15). Given the use of a cluster sampling method, a design effect of 2 was applied, increasing the required sample size to 1,160. A two-stage cluster sampling method to select 58 *grama niladhari* (GN) divisions (the smallest administrative unit in Sri Lanka) as clusters, proportionally from all 13 DS divisions. Each cluster comprised 20 households, selected systematically using a fixed interval. Within each GN division, the first household was chosen randomly from the updated voters list. If more than one eligible individual was present in a household, one was randomly selected. If no eligible participant was found, the survey continued to the next household until 20 participants per cluster were enrolled.

An interviewer-administered questionnaire in local languages was used to collect data. Alcohol consumption of the participants was assessed using the STEPS survey and WHO criteria (1, 16). A standard drink was defined as 10 ml of pure ethanol, roughly equivalent to 330 ml of beer, 120 ml of wine or 40 ml of hard liquor. Alcohol consumption was categorised, considering those who have consumed an alcoholic beverage in the past 30 days as ‘current drinkers’; consumed alcohol within the last year but not in the past 30 days as ‘non-current drinkers’; consumed alcohol at any point in their life as ‘ever-drinkers’; has never consumed alcohol as ‘never-drinker’; and consumed alcohol before but not in the past year as ‘former drinkers’.

The potential factors associated with alcohol consumption were identified based on the PRECEDE/PROCEED model that focusses on predisposing, enabling and precipitating factors (Table 1). Knowledge was assessed on health effects, ingredients, impact on pregnancy, addiction, treatment and advertising laws related to alcohol consumption and was categorized as satisfactory (≥ 12) or unsatisfactory (≤ 11) based on a cutoff score of 12. Attitudes were assessed on self-image, community views, quitting barriers, parental attitudes, prevention, advertising and taxation and

were classified as favourable (58–80) or unfavourable (16–17). The draft instrument was reviewed by five experts through a modified Delphi process to assess relevance, clarity and cultural fit. It was pre-tested on 20 adult Sinhala-speaking males from a non-sampled area. Test-retest reliability was assessed by re-administering 55 of the questionnaires within one week and was found to be strong (correlation coefficients above 0.788 for continuous variables and kappa values over 0.93 for categorical variables) and statistically significant ($p < 0.05$).

Data collection was carried out by trained pre-intern medical graduates privately in the households of participants. To reduce information, non-response and social desirability biases, data collectors received structured training and provided clear explanations to participants. Up to two follow-up visits were made if participants were initially unavailable.

Data analysis

Data were analysed using Statistical package for the Social Sciences (SPSS) version 20. The correlates of alcohol consumption were assessed between current drinkers and never drinkers using bivariate analysis. These correlates were determined using odds ratios (OR) and confidence intervals (95% CI). To account for potential confounding, logistic regression analysis was carried out with the enter method. Variables with a significance level of $p < 0.05$ were considered statistically significant.

Results

The sample consisted of 1,106 participants, yielding a 95.4% response rate. The average age was 45.7 years ($SD = 17.4$). Most participants were from urban areas (77.7%), Sinhalese in ethnicity (75.6%) and educated beyond the General Certificate of Education (GCE) Ordinary Level (85.4%). Around 66% earned a mean monthly income of USD 163 ($SD = 127.9$) (Table 1). According to the STEPS criteria, 29.3% (95% CI: 26.7, 32.0%) were current drinkers while

8.9% (95 % CI: 7.4%-10.8%) were non-current drinkers. Former drinkers made up 15.2% (95% CI: 13.2, 17.4%), while never drinkers constituted 46.6% (95% CI: 43.6, 49.5%).

In the bivariate analysis (Table 3), 21 factors associated with alcohol consumption were identified. Of these, in the logistic regression analysis (Table 4), 10 factors remained to be significantly associated with alcohol consumption ($p < 0.05$). Being of younger age (AOR: 0.3; 95% CI: 0.2, 0.5), being Sinhalese (AOR: 9.7; 95% CI: 2.9, 33.1), married (AOR: 2.4; 95% CI: 1.4, 4.0) or being employed (AOR: 5.9; 95%

CI: 3.4, 10.0) were linked to higher odds of current alcohol use. Smokers were 4.5 times more likely to consume alcohol during last 30 days (AOR: 4.5; 95% CI: 2.7, 7.4) as well as those having poor knowledge (AOR: 2.3; 95% CI: 1.5, 3.6) and unfavourable attitudes (AOR: 5.4; 95% CI: 3.4, 8.6). Family influence was significant, such as having a father alive during childhood reducing the current drinking risk by 80% (AOR: 0.2; 95% CI: 0.1, 0.5) and witnessing family members consume alcohol increasing the odds of drinking by 2.3 times (AOR: 2.3; 95% CI: 1.3, 4.1).

Table 1: Classification of factors associated with alcohol consumption based on the Precede-Proceed model

Category	Sub-category	No. of items	Scoring method
Predisposing factor	Knowledge	18 (score range: 0-18)	Yes - 0, No - 0, Don't know - 0
	Attitudes	16 (score range: 16-80)	Strongly agree - 5; Agree - 4; Don't know - 3; Disagree - 2; Strongly disagree - 1
	Smoking and substance use	2	Binary responses (Yes / No)
Enabling factor	Alcohol availability	2	Binary responses (Yes / No)
	Alcohol accessibility	2	Binary responses (Yes / No)
Precipitating factor	Family influence	3	Binary responses (Yes / No)
	Peer influence	3	Binary responses (Yes / No)
	Media influence	2	Binary responses (Yes / No)

Discussion

This study explored the factors associated with alcohol consumption among current and never user male participants in the Colombo District. It identifies marital status, advancing age, smoking, poor knowledge and unfavourable attitudes as correlates of current drinking and stresses the influence of social factors like family and peer pressure and alcohol availability, especially among younger individuals.

This study was conducted between 2019 and 2020, before the release of STEPS Survey 2021 (17). However, this study remains highly relevant as it provides an in-depth insight into alcohol

consumption, particularly among adult males in the most urban district in Sri Lanka. Additionally, the study captures demographic and socioeconomic patterns not fully captured in the STEPS Survey and applies the PRECEDE-PROCEED model to examine predisposing, enabling and precipitating factors influencing alcohol use. By assessing both social and behavioural aspects, the study offers evidence to guide targeted interventions and policy decisions.

The 2021 STEPS survey indicated that 43% of Sri Lankan males were current alcohol consumers, while 34.2% had never consumed alcohol. In comparison, the current study reported a lower prevalence of current drinking at 29.3% and a higher percentage of

never drinkers at 46.6%. This comparatively lower rate of alcohol consumption in the Colombo District may be attributed to several factors, including higher levels of education, a larger Muslim population among whom alcohol consumption is discouraged on religious grounds, and better access to health information (18-19). This discrepancy is particularly significant given that the current study was conducted during the early phase of COVID-19 pandemic. The unique circumstances of the pandemic, including widespread social restrictions and government-imposed limitations on movement and alcohol sales, likely influenced drinking behaviours. In concurrence, a study conducted in the Anuradhapura District during the same period (late 2019 to early 2021) reported a similar alcohol consumption pattern (20). However, with the relaxation of restrictions and the return to normalcy post-pandemic, alcohol consumption appears to have increased due to stress-related drinking and the resumption of social activities (21-22). These reasons may help explain the higher prevalence figures reported in the 2021 STEPS survey.

The associations in this study align with established health behaviour theories, such as the Theory of Planned Behaviour (TPB). According to TPB, behavioural intentions are influenced by attitudes, subjective norms and perceived behavioural control (23). Unfavourable attitudes and perceived social acceptance were strong predictors of increased drinking (6). The 2021 STEPS Survey showed 15.1% of males engaged in heavy episodic drinking (six or more drinks in a single session), suggesting that social acceptability significantly influences drinking, particularly among Sinhalese men who may drink for social integration and acceptance (17). Individuals with limited knowledge on alcohol's health risks are more likely to engage in risky drinking (24). Enhancing alcohol-related education and promoting positive attitudes are vital for reducing alcohol-related issues, especially among young adults.

Interventions should focus on improving knowledge and promoting healthier drinking behaviours.

Social Learning Theory also supports the idea that alcohol consumption is learned through observation and imitation (25). Family and peer influence plays a critical role in both initiating and maintaining alcohol consumption. The family environment shapes drinking behaviours, with parental drinking habits influencing children's future drinking patterns (26). In Sri Lanka, close family ties and peer influence strongly affect youth alcohol use. A 2015 review of over 26,000 families found parental drinking linked to higher youth consumption, stressing the need for school-based prevention programs (26). However, the survey's finding that younger males are less likely to consume alcohol is an encouraging trend, aligning with similar patterns observed in the USA and Europe (27). Studies from these regions have reported a noticeable decline in alcohol use among younger populations in recent years, often attributed to increased health awareness and influence of digital media promoting healthier lifestyles (27).

The influence of marital status on alcohol consumption in this study contrasts with patterns observed in developed countries, where marriage is often linked to lower alcohol use due to spousal support and shared health-conscious behaviours (28). In Sri Lanka, however, married men showed higher rates of alcohol consumption, which may be attributed to cultural and social norms where alcohol is commonly present at family gatherings, weddings and other social functions (29). Additionally, married men may experience increased social networking, work-related stress, and financial pressures, which can further contribute to alcohol use as a form of social bonding or coping mechanism.

The well-established co-occurrence of tobacco smoking and alcohol consumption was also evident in this study, with smokers found to be nearly three times more likely to consume alcohol.

Table 2: Sociodemographic characteristics of the study population

Basic characteristics	No.	%
Age (years)		
18-29	275	24.9
30-44	273	24.7
45-59	242	21.9
60-74	280	25.3
75-88	36	3.2
Ethnicity		
Sinhala	836	75.6
Tamil	110	9.9
Muslim	159	14.4
Burgher	1	0.1
Religion		
Buddhism	787	71.2
Hindu	81	7.3
Islam	159	14.4
Roman Catholic/Christian	79	7.1
Educational qualification		
No formal schooling	45	4.1
Elementary education 1 – 5	11	1.0
Secondary	757	68.4
Tertiary (Degree or above)	293	26.5
Employment status		
Employed (Permanent)	212	19.2
Employed (Temporary)	246	22.2
Self-employed	270	24.4
Retired	71	6.4
Unemployed	307	27.8
Current marital status		
Unmarried	339	30.7
Married	752	68.0
Separated/ Divorced	6	0.5
Widowed	9	0.8
Personal average monthly income (USD)		
Less than 83.3	68	6.1
83.3 - 166.6	370	33.5
166.7 - 250.0	211	19.1
250.1 and above	82	7.4
No response	375	33.9

Table 3: Factors significantly associated with current drinking in bivariate analysis

Factor	Current drinkers (n=324)		Never drinkers (n=515)		Unadjusted OR (95% CI)	p-value
	No.	%	No.	%		
Age: Less than 45 years	127	39.2	342	66.4	0.3 (0.2, 0.4)	< 0.001
Ethnicity: Sinhalese	273	84.3	342	66.4	2.7 (1.9, 3.8)	< 0.001
Religion: Buddhist	249	76.9	332	64.5	1.8 (1.3, 2.5)	< 0.001
Marital status: currently Married	249	76.9	266	51.7	3.1 (2.3, 4.2)	< 0.001
Education: No schooling/ up to grade 1- 11	56	17.3	54	10.5	1.8 (1.2, 2.7)	< 0.005
Employment status: Employed	282	87.0	294	57.1	5.1 (3.5, 7.3)	< 0.001
Social class: I-Va	282	87.0	294	57.1	5.0 (3.5, 7.3)	< 0.001
Diabetes status: Yes	60	18.5	60	11.7	1.7 (1.2, 2.5)	< 0.006
Current tobacco smoking: Yes	146	45.1	66	12.8	5.6 (4.0, 7.8)	< 0.001
Knowledge level on alcohol consumption: Unsatisfactory	217	67.0	198	38.4	3.3 (2.4, 4.3)	< 0.001
Attitudes on alcohol consumption: Unfavourable	209	64.5	119	23.1	6.0 (4.5, 8.2)	< 0.001
Father alive when participant was young: Yes	294	90.7	494	95.9	0.4 (0.2, 0.7)	< 0.002
Father consumed alcohol when participant was young: Yes	212	72.1	281	56.9	2.0 (1.4, 2.7)	< 0.001
Father consumed alcohol in the presence of participant when young: Yes	92	43.4	72	25.6	2.2 (1.5, 3.3)	< 0.001
Other members consumed alcohol in the presence of participant when young: Yes	91	28.1	55	10.7	3.2 (2.3, 4.7)	< 0.001
Forced to consume alcohol by close friends when the participant was young: Yes	126	43.2	145	30.7	1.7 (1.3, 2.3)	< 0.001
Beer available when young: Yes	137	42.3	160	31.1	1.6 (1.2, 2.2)	< 0.001
Bar close to home when young: Yes	121	37.3	120	23.3	2.0 (1.5, 2.7)	< 0.001
Bar distance < 1km when young: Yes	397	67.2	376	73.0	0.6 (0.5, 0.9)	0.040
Alcohol within 10 minutes reach when young: Yes	120	37.0	105	20.4	2.3 (1.7, 3.1)	< 0.001

*Social class categorized according to Barker and Hall's social class classification (Cutting, 1992); OR- odds ratio

The combined use of tobacco and alcohol significantly amplifies health risks, increasing the likelihood of cancer, cardiovascular disease and respiratory illnesses beyond the risks posed by either substance alone (30). This overlap was also highlighted in the 2021 STEPS survey, highlighting the importance of integrated prevention strategies. In this context, comprehensive programmes could improve health outcomes and reduce the long-term burden on healthcare systems.

The study had a few limitations. The clustering effect with 20 participants per cluster, could lead to underestimation of drinking prevalence. Additionally, using cumulative GN-specific population data rather than the ideal male population may have introduced inaccuracies. More research is needed to understand how social media is shaping youth drinking habits, with alcohol companies targeting younger audience's online platforms influence young people's alcohol use.

Table 4: Factors associated with alcohol consumption in logistic regression analysis

Variable	β	SE	Wald	df	Sig.	AOR	95% CI	
							Lower	Upper
Age: Less than 45 years	-1.2	0.2	20.9	1	0.001	0.3	0.2	0.5
Ethnic group: Sinhalese	2.3	0.6	13.5	1	0.001	9.7	2.9	33.1
Marital status: Currently married	0.9	0.3	12.3	1	0.001	2.4	1.4	4.0
Employment status: Employed	1.8	0.3	42.0	1	0.001	5.9	3.4	10.0
Smoking status: Current tobacco smoking	1.5	0.3	34.7	1	0.001	4.5	2.7	7.4
Knowledge level on alcohol consumption: Unsatisfactory	0.8	0.2	13.7	1	0.011	2.3	1.5	3.6
Attitudes on alcohol consumption: Unfavourable	1.7	0.2	52.1	1	0.001	5.4	3.4	8.6
Father alive when the participant was young: Yes	-1.5	0.4	12.5	1	0.001	0.2	0.1	0.5
Other members consumed alcohol in-front of when the participant was young: Yes	0.8	0.3	8.4	1	0.004	2.3	1.3	4.1
Availability of alcohol when the participant was young: Available	0.5	0.2	4.3	1	0.037	1.7	1.1	2.7
Constant	-4.1	0.7	35.3	1	0.000	0.2		

AOR- Adjusted odds ratio

Conclusions & Recommendations

This study provides valuable insights into factors associated with alcohol consumption among adult males in Colombo District. The findings highlight the need for targeted interventions focussed on

modifiable risk factors, such as poor knowledge, unfavourable attitudes and smoking. Addressing the influence of family and peer relationships and understanding the socio-cultural context of Sri Lanka are essential for developing effective strategies to reduce alcohol consumption and its associated harms.

Public Health Implications

- The study underscores alcohol consumption as a pressing public health concern in Sri Lanka, particularly among older adult males in Colombo.
- Significant modifiable risk factors include poor knowledge, unfavourable attitudes tobacco smoking and family and peer influence, while non-modifiable socio-demographic influences were age, occupation, ethnicity, and marital status.
- Findings highlight the need for targeted health interventions focusing on modifiable factors and fostering family- and community-based prevention efforts.
- Educational campaigns should address gaps in alcohol awareness, while integrated initiatives targeting both smoking and alcohol can mitigate their co-occurrence.

Author Declarations

Competing interest: There are no competing interests for any author

Ethics approval and consent to participate: Ethics clearance was granted by the Ethics Review Committee of the Faculty of Medicine, University of Colombo, Sri Lanka (Reference: EC-19-050). Informed written consent was obtained from each participant prior to data collection. Administrative approval was obtained from the Provincial Director of Health Services (PDHS), Western Province and Regional Director of Health Services (RDHS), Colombo.

Funding: Self-funded

Acknowledgments: We would like to express our sincere gratitude to all those who contributed to this study. Our deepest appreciation goes to the participants, whose willingness and cooperation made this research possible.

Author contributions: MK conceptualized the study, designed the methodology, oversaw data collection, contributed to data analysis and interpretation, and drafted and revised the manuscript; NT contributed to design the study methodology, data analysis, validation of results and interpreted findings, critical revisions and contributed to drafting the manuscript; VK contributed to design the study methodology, data analysis, and interpreted findings, critical revisions and contributed to drafting the manuscript.

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