

## SHORT ARTICLE

# Prevalence, patterns and determinants of tobacco and alcohol use among construction site workers in Dehradun, Uttarakhand

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## ARTICLE CYCLE

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## ABSTRACT

**Background:** The construction industry is a vast industry in India, employing millions of workers. Higher rates of tobacco and alcohol use is seen among its workers. **Aims and Objectives:** The objective of the study was to determine the prevalence, patterns and determinants of tobacco and alcohol use among them. **Methodology:** A Cross-sectional study was conducted at a construction site on 401 study participants, using a pre-designed and pre-tested schedule. Socio demographic and other data about tobacco and alcohol use were taken from them. The data was analyzed by using Chi-square test of significance for testing the associations of various variables with tobacco and alcohol use. **Results:** Prevalence of tobacco use was 73% and alcohol was 38.4%. Age, gender, marital status and education were found to be significantly associated with both tobacco and alcohol use. **Conclusion:** The high prevalence of tobacco and alcohol use by the workers warrants strong measures so that they remain healthy and tobacco free.

## KEYWORDS

Construction Workers; Tobacco Use; Alcohol Use; Determinants

## INTRODUCTION

Tobacco and alcohol use is one of the major modifiable risk factors for many chronic diseases. Although global tobacco use has declined in the past two decades from 49% to 22% among all adults, but it is still a public health problem(1). In India 38% of all men and 8.9% of women, over 15 years of age, use tobacco(2). It is one of the causes of death and disease in India accounting for nearly 1.35 million deaths every year(3). Worldwide, around 2.6 million deaths were caused by alcohol consumption, affecting males more than females(4). In India 19% of males and 1% females above 15 years of age consume alcohol(2). In the state of Uttarakhand, it is 38% for tobacco and 32% for alcohol(5). Hence this study aimed to determine the prevalence and pattern of tobacco and alcohol use among construction site workers.

## Objectives

- To study the prevalence of tobacco and alcohol use among construction site workers.
- To study the pattern of tobacco and alcohol use among construction site workers.
- To assess socio-demographic factors leading to tobacco and alcohol use.

## MATERIAL & METHODS

**Study Type and Study design:** Community-based observational cross-sectional study.

**Study Setting:** The study was done on building construction site workers in Dehradun.

**Study Population:** All unskilled (digging, carrying material, site cleanup etc.) and skilled workers (Electrician, Plumber, Mason, Welder, carpenter, heavy equipment operators etc.), aged 15 years above at the construction site.

**Study Duration:** January 2025 to March 2025.

**Sample Size calculation:** Sample size was calculated by using the formula  $4pq/L$  (2). As per National Family Health Survey-5 (NFHS- 5) Uttarakhand, Tobacco consumption among men is 38% and alcohol consumption is 32%(5). Taking the prevalence, with 5% absolute precision, the sample size was calculated as 380 for tobacco use and 348 for alcohol use. In our study, we interviewed 401 workers after taking their consent.

**Inclusion Criteria:** All construction site workers, above 15 years of age and willing to participate in the study.

**Exclusion Criteria:** Workers who were not willing, pregnant female workers,  $\leq 14$  years of age were excluded.

**Strategy for data collection:** The study instrument was predesigned, pretested and semi-structured schedule which included socio-demographic details, history of tobacco and alcohol use and its pattern. The study participants were interviewed after taking their consent. The survey was conducted in off-hours to avoid work disturbances.

**Working Definition: Tobacco User:** An individual who has consumed any tobacco products (smoking or smokeless) in their lifetime. **Tobacco non-user:** An individual who has never consumed tobacco products (smoking or smokeless) in their lifetime.

**Alcohol User:** An individual who has consumed alcohol in their lifetime. **Alcohol non-user:** An individual who has never consumed alcohol in their lifetime.

**Ethical Issues and informed consent:** Ethical approval was obtained from the Institutional Review Board via letter no: GEIMS/IRB/RP/27/2025 dated 14<sup>th</sup> February 2025. Necessary permission was obtained from the authority at the construction site for conducting the interview. Written informed consent was obtained from all the participants before conducting the interview. Participants who were illiterate were told about the study purpose in front of a witness and interviewed after their consent.

**Data Analysis:** The data was presented in frequency and percentages to summarize categorical variables in substance use. Associations between variables (age, gender, education, family type, socioeconomic status, working hours, type of work) and tobacco/alcohol consumption were evaluated using Chi-square and Fisher's Exact test at 95% confidence level, with statistical significance set at  $p < 0.05$ . The analysis was performed by using SPSS 26.0 version statistical software.

## RESULTS

The study included a total of 401 construction site workers. Maximum participants 180 (44.9%), were aged between 25 and 34 years, and were predominantly male, comprising 353(88%) individuals. The majority of participants, 311(77.6%) were married, with maximum being Hindu, 320(79.8%).

Out of all the workers, 70(17%) workers were illiterate, while 239(59.6%) had completed education up to the middle school level. Additionally, 82(20.5%) participants had attained an intermediate level of education, and only 10(2.4%) individuals were graduates. Most workers belonged to socio-economic class IV177 (44.1%). Notably, a remarkable, 350(87.3%) workers were categorized as unskilled labourers. Maximum participants, 278(69.3%), belonged to nuclear family. Regarding working hours, it was observed that 173(43.1%) workers were engaged in work for more than eight hours daily. (Table 1)

The study revealed that, among 401 construction workers, 294(73.4%) were only tobacco users. Smokeless tobacco products (e.g., khaini, gutkha) dominated consumption patterns, accounting for 232(78.9%) of tobacco users, while smoking was reported by 62(21.1%) tobacco users. Alcohol consumption was reported by 154(38%) of participants. Tobacco and alcohol co-consumption was prevalent, with 135(33.7%). Conversely, 88(21.9%) workers abstained from both tobacco and alcohol. Among tobacco users, 10(3.4%) exceeded five cigarettes daily, while 15(5%) consumed over 100 grams of smokeless tobacco daily. 23(14.9%) of alcohol users exhibited taking  $>180$  ml of alcohol daily. (Table 2) Tobacco use was most prevalent among individuals aged 25-34 years, 143(48.6%). Similarly, alcohol use was highest 63(40.9%) in the 25-34 years age group. Younger individuals are more likely to use tobacco and alcohol in our study. There was significant association between age and both tobacco use and alcohol use ( $p < 0.05$ ).

Tobacco use was predominantly seen in males, 281(95.6%) compared to females, 13(4.4%). Similarly, alcohol use was overwhelmingly higher among males, 153(99.3%) compared to females 1(0.7%). There was significant association between gender with tobacco use and alcohol use. ( $p < 0.05$ ). Married individuals had a higher prevalence of tobacco use 240(81.6%) compared to unmarried individuals 54(18.3%), with a significant association ( $p < 0.05$ ). Similarly, alcohol use was more common among married individuals, 131(85.1%) than unmarried individuals 23(14.9%), with this difference being statistically significant ( $p < 0.05$ ).

Tobacco use was most prevalent among Hindus, 232(78.9%) compared to Muslims 60(20.4%) though this association was not statistically significant ( $p>0.05$ ). However, alcohol use was significantly higher among Hindus, 149(96.8%) compared to Muslims, 5 (3.2%) ( $p<0.05$ ). Tobacco use was highest among individuals educated up to middle, 191(64.9%) ( $p<0.05$ ) and lowest among graduates and above, 4(1.36%). Similarly, middle-educated individuals had higher alcohol consumption, 105(68.2%) ( $p<0.05$ ) compared to graduates and above, 4(2.6%).

There was no significant associations between the type of work (skilled vs unskilled) and substance use for either tobacco or alcohol users. Tobacco users included 37(12.6%) skilled workers and 257(87.4%) unskilled workers, while alcohol users included 18(11.9%) skilled workers and 136(88.3%) unskilled workers. Those working for <8 hours, 70(65.4%) were not consuming tobacco as compared to those working >8 hours 37(35.9%) ( $p<0.05$ ). (Table 3)

**Table 1: Socio-demographic distribution of study participants (n = 401)**

	No. of workers (n)	Percentage (%)
<b>Age in Years</b>		
15-24	103	25.7
25-34	180	44.9
35-44	96	23.9
45-54	17	4.24
55 & above	5	1.25
<b>Gender</b>		
Males	353	88.0
Females	48	12.0
<b>Marital Status</b>		
Married	311	77.6
Unmarried	90	22.4
<b>Religion</b>		
Hindu	320	79.8
Muslim	77	19.2
Others	4	1.0
<b>Education</b>		
Illiterate	70	17.5
Upto middle	239	59.6
Upto intermediate	82	20.5
Graduate & above	10	2.5
<b>Socio-Economic Class (As per BG Prasad Socio-economic Classification, 2024)</b>		
I	37	9.2
II	37	9.2
III	117	29.2
IV	177	44.1
V	33	8.2
<b>Type of family</b>		
Nuclear	278	69.3
Joint	123	30.7
<b>Work hours</b>		
≤ 8 hours	228	56.9
>8 hours	173	43.1
<b>Type of Work</b>		
Skilled	51	12.7
Unskilled	350	87.3

**Table 2: Pattern of tobacco and alcohol consumption by the study participants.**

Type of consumption	Category		Frequency of tobacco/ alcohol per day	Percentage (%)
<b>Only Tobacco (294)</b>	Smoking	≤5 cigarettes/bidi	52	17.7
		>5 cigarettes/bidi	10	3.4
	Smokeless (Khaini/ Gutkha)	≤ 5 Pkts	217	73.8
		> 5 Pkts	15	5.1
<b>Only Alcohol (154)</b>	user	≤ 180 ml	131	85.1
		> 180 ml	23	14.9
Both	Tobacco & Alcohol		135	33.7
None	Tobacco & Alcohol		88	21.9

**Table 3: Association of tobacco and alcohol use/ non-use with socio demographic variables.**

Categories	Tobacco User (%)	Tobacco Non-User (%)	p-value	Alcohol User	Alcohol Non-User	p-value
<b>Age</b>						
15-24	60 (20.4)	43 (40.2)	0.0018*	26 (16.9)	77 (31.2)	0.0000*
25-34	143 (48.6)	37 (34.6)		63 (40.9)	117 (47.4)	
35-44	75 (25.5)	21 (19.6)		52 (33.8)	44 (17.8)	
45-54	13 (4.4)	4 (3.7)		8(5.2)	9 (3.6)	
55 & above	3 (1.02)	2 (1.9)		5 (3.2)	0 (0)	
<b>Gender</b>						
Male	281(95.6)	72 (67.3)	0.00001*	153 (99.4)	200 (80.9)	0.00001*
Female	13 (4.4)	35 (32.7)		1 (0.7)	47 (19.0)	
<b>Marital Status</b>						
Married	240 (81.6)	71 (66.4)	0.0011*	131 (85.1)	180 (72.9)	0.0044*
Unmarried	54 (18.4)	36 (33.6)		23 (14.9)	67 (27.1)	
<b>Religion</b>						
Hindu	232 (78.9)	88 (82.2)	0.35781	149 (96.8)	171 (69.2)	0.0000*
Muslim	60 (20.41)	17 15.9)		5 (3.2)	72 (29.1)	
Others	2 (0.68)	2 (1.9)		0 (0)	4 (1.6)	
<b>Education</b>						
Illiterate	46 (15.6)	24 (22.4)	0.0010*	20 (12.9)	50 (20.2)	0.0433*
Upto Middle	191 (64.9)	48 (44.9)		105 (68.2)	134 (54.3)	
Upto Intermediate	53 (18.0)	29 (27.1)		25 (16.2)	57 (23.1)	
Graduate & above	4 (1.4)	6 (5.6)		4 (2.6)	6 (2.4)	
<b>Type of Work</b>						
Skilled	37 (12.6)	14 (13.1)	0.8944	18 (11.7)	33 (13.4)	0.625
Unskilled	257 (87.4)	93 (86.9)		136 (88.3)	214 (86.6)	
<b>Socio-economic Class (Modified BG Prasad Classification updated 2024)</b>						
I	21 (7.1)	16 (14.9)	0.10368	8 (5.19)	29 (11.7)	0.103388
II	27 (9.2)	10 (9.3)		11 (7.14)	26 (10.5)	
III	93 (31.6)	24 (22.4)		49 (31.81)	68 (27.5)	
IV	130 (44.2)	47 (43.9)		70 (45.45)	107 (43.3)	
V	23 (7.8)	10 (9.3)		16 (10.39)	17 (6.9)	
<b>Family Type</b>						
Nuclear	209(71.1)	69 (64.5)	0.2047	102 (66.2)	176 (71.3)	0.2889
Joint	85 (28.9)	38 (35.5)		52 (33.8)	71(28.8)	
<b>Working Hours</b>						
≤ 8 hours	158(53.7)	70(65.4)	0.03674*	86(55.8)	142(57.5)	0.74621
>8 hours	136(46.3)	37(34.6)		68(44.2)	105(42.5)	

\*Statistically significant

## DISCUSSION

The study pointed out high prevalence of Tobacco (73%) and alcohol (38%) among construction workers. The construction site majorly consisted of young male (88%) work force in the age group of <35 years (70.4%). The average age of respondents was  $30.07\pm8.04$  years. Other studies by Kumar J, Parasher M and Gupta RK reported similar young male predominance at construction worker sites. (6,7,8)

Most of the workers in our study were educated up to middle school (59.6%) though (17.5%) were illiterate. The study conducted by Sushanti S et al and Shivalli et al. also found that workers at construction sites have low educational status. (9,10)

Almost half of the workers (44%) in the study belonged to Socioeconomic Class IV. More workers in the study (69.3%) belonged to nuclear families. This may be due to rapid industrialization, urbanization and decrease in joint family traditions in India. (11) The prevalence of tobacco in our study was 73.3%, which is higher as compared to 35% reported by Amrutha AM among migrant workers in Karnataka (12). In our study, tobacco use is more common in the younger age group and married people. The use of tobacco was seen more common among those educated up to middle school as compared to people who are graduates. Similar result of more tobacco use among younger age and married persons were shown in a study by Divina Kumar et al in West India. (13)

Our study didn't find any significant association between socioeconomic class and tobacco and alcohol use. This finding is in contrast with the finding by Keshava Reddy who found a significant association of tobacco and alcohol use and socioeconomic class. (14) A substantially high percentage of workers (43%) in the study were working more than eight hours a day which adds to both physical and mental fatigue.

## CONCLUSION

The study concluded high prevalence of tobacco (73%) and alcohol (38%) consumption among construction workers in Dehradun. Young male construction workers were the highest users of tobacco and alcohol. The consumption of tobacco and alcohol is linked to a range of Non-Communicable Diseases (NCDs), which contribute to premature deaths and increased healthcare costs, thereby straining public health systems.

## RECOMMENDATION

There is an urgent requirement for targeting vulnerable groups to address the problem of tobacco and alcohol consumption. Health education programs focusing on the adverse effects of tobacco and alcohol, de-addiction counselling, and periodic health check-ups, including cancer screening, are recommended to safeguard the health of construction workers. These measures are essential not only for improving individual health outcomes but also for enhancing workplace safety and productivity.

## LIMITATION OF THE STUDY

The study's cross-sectional design, bias due to self-reporting and single construction site limits its generalizability.

## RELEVANCE OF THE STUDY

This study enhances the existing literature on prevalence of tobacco and alcohol consumption among construction site workers. These workers face unique occupational stress, including physically demanding work, job insecurity, and migrant lifestyles.

## AUTHORS CONTRIBUTION

Concept & Design NU, editing NU and KG, Manuscript Writing NU and KG, statistical analysis AM & editing NU and KG.

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Nil

## CONFLICT OF INTEREST

Nil

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## DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The Authors have not used any generative AI/ AI assisted technologies for writing the manuscript.

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