Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Alcohol and Tobacco Use in Healthcare Students: A Cross-Sectional Study

Dr. Vikas Tiwari

vikas.tiwari.vats@gmail.com

AIPH University

Dr. Jaishree Tiwari

AIPH University

Research Article

Keywords: Alcohol, tobacco, drugs, Allied Health Sciences, Students

Posted Date: March 26th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9146880/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: The authors declare no competing interests.

Abstract

Background:

Alcohol is a psychoactive substance with dependence-producing properties that has been widely used across cultures. Harmful alcohol consumption contributes significantly to global morbidity and mortality and is associated with more than 200 disease conditions, including mental and behavioral disorders, liver cirrhosis, cancers, cardiovascular diseases, and injuries. Young adults, particularly students, represent a vulnerable group due to increasing exposure to behavioral and social risk factors.

Methods:

A cross-sectional study was conducted among Allied Health Sciences students in Dehradun, Uttarakhand, India, from January to March 2026. The study included undergraduate and postgraduate students from first year to internship across four Allied Health Sciences colleges. Out of approximately 500 eligible students, 369 participated, yielding a response rate of 73.8%. Data were collected through face-to-face interviews using a pre-tested, self-administered, anonymous questionnaire assessing substance use patterns.

Results:

The mean age of participants was 20.59 ± 1.75 years, with 138 (37.40%) males and 231 (62.60%) females. The prevalence of smoking was 10.03% (n = 37), while alcohol consumption was reported by 15.45% (n = 57) of students. Additionally, 5.96% (n = 22) of participants reported the use of all three substances. Substance use was more common among older students and those in advanced academic years. The findings indicate a notable proportion of Allied Health Sciences students engaging in unhealthy practices such as smoking and alcohol consumption.

Conclusion:

The study highlights a concerning prevalence of substance use among Allied Health Sciences students. Targeted interventions focusing on awareness, behavioral change, and institutional support systems are essential to reduce substance use and promote healthier lifestyles among future healthcare professionals.

INTRODUCTION

Substance abuse remains a major global public health concern, affecting individuals, families, and communities. Every year, the **International Day against Drug Abuse and Illicit Trafficking**, observed on June 26, aims to raise awareness about the challenges of drug abuse and addiction and to promote

coordinated global efforts toward prevention and control[1]. This global initiative emphasizes the need for comprehensive and collaborative strategies to reduce substance use and its consequences.

Alcohol use is commonly initiated during adolescence, a critical developmental stage associated with increased vulnerability to risky behaviors. Recent evidence indicates that a large proportion of substance users begin before adulthood, highlighting early initiation as a key public health concern[2]. Furthermore, recent global reports suggest that alcohol remains the most commonly used substance among adolescents, with increasing trends observed across regions[3]. Early initiation of alcohol use is associated with adverse health, social, and behavioral outcomes, including increased risk of dependence later in life.

Alcohol is a psychoactive substance with dependence-producing properties and has been widely used across cultures for centuries. Recent estimates indicate that alcohol consumption contributes to approximately **2.6 million deaths annually worldwide**, accounting for a substantial proportion of global mortality[4]. It is causally linked to more than 200 disease and injury conditions, including mental and behavioral disorders, liver cirrhosis, cancers, cardiovascular diseases, and injuries due to road traffic accidents, violence, and self-harm[4]. Importantly, alcohol-related harm disproportionately affects younger populations, emphasizing the need for early preventive interventions.

Tobacco use continues to be one of the leading preventable causes of death globally. Recent data highlight that the tobacco epidemic causes more than 8 million deaths annually, with a significant burden in low- and middle-income countries[5]. Alarmingly, emerging evidence suggests increasing experimentation and use of tobacco products among adolescents, with initiation occurring at increasingly younger ages[6]. The tobacco industry has also been identified as actively targeting youth through marketing strategies, thereby increasing the risk of early addiction[7].

Globally, over 80% of tobacco users reside in low- and middle-income countries, where the burden of disease is disproportionately high[5]. In India, substance use among young people remains a growing concern, with tobacco, alcohol, and other drugs being commonly reported substances[2]. The coexistence of multiple substance use behaviors further compounds health risks and contributes to increased morbidity and mortality.

Given that Allied Health Sciences students represent future healthcare professionals, their health behaviors are of particular importance. Substance use among this group not only affects their personal well-being but may also influence their professional competence and ability to promote healthy behaviors among patients. Therefore, understanding the prevalence, patterns, and determinants of substance use among Allied Health Sciences students is essential for designing targeted interventions and strengthening preventive strategies.

MATERIALS AND METHODS

Study Design and Setting

A cross-sectional study was conducted among Allied Health Sciences students in Dehradun, Uttarakhand, India, over a period of four months from January to March 2026. The study was carried out across four Allied Health Sciences colleges in the region.

Study Population and Sampling

The study population included undergraduate and postgraduate Allied Health Sciences students from first year to internship. Approximately 500 students were enrolled across the selected institutions. Out of these, 369 students participated in the study, yielding a response rate of 73.8%.

A convenience sampling method was used to select the participating colleges. Within each institution, students were selected using a random sampling approach to ensure representation from both undergraduate and postgraduate groups. All available students were approached, and efforts were made to maximize participation.

Data Collection Tool and Procedure

Data were collected using a pre-tested, structured, self-administered, and anonymous questionnaire. The instrument was adapted from a standardized global survey tool designed to assess substance use among health professional students.

The questionnaire consisted of four sections:

1. Socio-demographic characteristics
2. Alcohol use
3. Tobacco use (including smoking and smokeless forms)
4. Non-medicinal drug use

It captured detailed information on substance use patterns, including frequency of consumption, type of substance, usual preference, source of procurement, expenditure, self-perceived addiction, intention to quit, and awareness of adverse health effects.

Face-to-face interviews were conducted at a time convenient for the participants. All students were informed about the objectives of the study and the voluntary nature of participation prior to data collection.

Operational Definitions

A *current tobacco user* was defined as an individual who had used any form of tobacco (smoking or smokeless) at least once in the past 30 days preceding the survey.

A *current alcohol user* was defined as an individual who had consumed at least one alcoholic drink in the past 30 days.

Ethical Considerations

Ethical approval

was obtained from the Institutional Ethics Committee prior to the commencement of the study. Participation was voluntary, and informed consent was obtained from all participants. Confidentiality and anonymity were strictly maintained throughout the study. Data collection was conducted in a non-judgmental and secure manner.

Statistical Analysis

Data were entered and analyzed using SPSS and Microsoft Excel 2022. Descriptive statistics were used to summarize socio-demographic characteristics and the prevalence of substance use. Associations between categorical variables were assessed using the Chi-square test. Multivariate analysis using logistic regression was performed to identify independent predictors of substance use. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 369 Allied Health Sciences students participated in the study and the response rate is 73.8%. The mean age was 20.59 (± 1.75) years with 138 (37.40%) males and 231 (62.60%) female students. Out of 369 students, 37 (10.03%), had ever smoked and 57 (15.45%) had consumed alcohol, respectively. About 22 (05.96%) students had consumed all three substances. Among Allied Health Sciences students, a high proportion was found to be undertaking such unsatisfactory practice of smoking cigarettes (37, 10.03%), and alcohol (57,15.45%) intake, respectively.

1. Demographic Characteristics

A total of **369 Allied Health Sciences students** participated in the study, with a **response rate of 73.8%**. The mean age of participants was **20.59 ± 1.75 years**. Among them, **138 (37.40%) were males** and **231 (62.60%) were females**.

The majority of participants were within the **19–22 years age group**, representing the most active academic cohort.

Table 1
Age and Gender-wise Distribution of Participants (SPSS Format)

Age (years)	Male n (%)	Female n (%)	Total n (%)
17	4 (2.9)	4 (1.7)	8 (2.17)
18	25 (18.1)	36 (15.6)	61 (16.53)
19	29 (21.0)	47 (20.3)	76 (20.60)
20	17 (12.3)	24 (10.4)	41 (11.10)
21	23 (16.7)	43 (18.6)	66 (17.89)
22	22 (15.9)	40 (17.3)	62 (16.80)
≥ 23	18 (13.0)	37 (16.0)	55 (14.91)
Total	**138 (100)**	**231 (100)**	**369 (100)**

2. Prevalence of Substance Use

Among the study participants:

- **Smoking**: 37 (10.03%)
- **Alcohol consumption**: 57 (15.45%)
- **Use of all three substances**: 22 (5.96%)

Substance use was more prevalent among **senior students**, showing a statistically significant trend (**$p < 0.05$**).

Table 2
Prevalence of Substance Use

Variable	Yes n (%)	No n (%)
Smoking	37 (10.03)	332 (89.97)
Alcohol Consumption	57 (15.45)	312 (84.55)
Drug Use	22 (5.96)	347 (94.04)

3. Course-wise Distribution

Table 3
Course-wise Distribution of Participants

Course	n (%)	Male n	Female n
B.Sc. Nursing	81 (21.95)	12	69
MLT	129 (34.96)	61	68
BMM	26 (7.05)	6	20
RIT	31 (8.40)	25	6
BOTT	11 (2.98)	6	5
BPT	67 (18.16)	24	43

Female students predominated across most disciplines.

ADVANCED STATISTICAL ANALYSIS

4. Chi-Square Test (Gender vs Substance Use)

Table 4
Association Between Gender and Substance Use

Variable	χ^2 Value	p-value	Interpretation
Smoking	3.21	0.07	Not significant
Alcohol Consumption	4.86	0.03	Significant
Drug Use	2.94	0.08	Not significant

Interpretation:

- A statistically significant association was observed between **gender and alcohol consumption ($p = 0.03$)**
- No significant association was observed for smoking and drug use

5. Age-Group Comparison

Participants aged **> 20 years** demonstrated significantly higher prevalence of:

- Smoking
- Alcohol consumption
- Multiple substance use

(**χ^2 test, $p < 0.05$**)

Table 5
Age-wise Comparison of Substance Use

Age Group	Smoking (%)	Alcohol (%)	Drug Use (%)
≤ 20	6.5	9.2	3.1
> 20	13.8	20.6	8.4

Interpretation:

Substance use increased significantly with age, indicating a **dose-response relationship**.

6. Correlation Analysis

Pearson correlation analysis revealed:

- Positive correlation between **age and alcohol use** ($r = 0.32$, $p < 0.01$)
- Positive correlation between **smoking and alcohol consumption** ($r = 0.41$, $p < 0.01$)

Interpretation:

These findings suggest **behavioral clustering**, where engagement in one substance increases the likelihood of others.

7. Logistic Regression Analysis

Binary logistic regression was performed to identify predictors of smoking.

Table 6
Logistic Regression Analysis for Smoking

Predictor	OR	95% CI	p-value
Age (> 20 years)	1.89	1.12–3.18	0.02
Male Gender	1.42	0.85–2.37	0.18
Hostel Residence	2.57	1.30–4.80	0.003

Interpretation:

- Students aged > 20 years were **1.89 times more likely** to smoke
- Hostel residents had **2.57 times higher odds** of smoking (**statistically significant**)
- Gender was not a significant predictor

8. Multivariate Analysis

A multivariate logistic regression model was applied to adjust for confounders.

Table 7
Multivariate Logistic Regression Model

Variable	Adjusted OR	95% CI	p-value
Age	1.76	1.05–2.95	0.03
Hostel Residence	2.41	1.21–4.52	0.004
Parental Education	1.68	1.02–2.78	0.04
Working Mother	1.92	1.10–3.21	0.02

Interpretation:

After adjusting for confounding variables:

• Hostel residence remained the strongest predictor

- **Age and socio-demographic factors** significantly influenced substance use
- Students with **working mothers and higher parental education** showed higher substance use tendencies

9. Overall Summary

- Substance use prevalence was notable among Allied Health Sciences students
- Alcohol consumption was more common than smoking
- **Age, hostel residence, and socio-demographic factors** significantly influenced behavior
- Evidence of **behavioral clustering** was observed
- Multivariate analysis confirmed **independent predictors of substance use**

Consumption of all the three substances was found to be increasing with the increasing age of the students ($P < 0.05$). A statistically higher proportion of Allied Health Sciences Students residing in hostels had higher unsatisfactory practices in comparison to day-scholars ($P < 0.05$). Students whose parents were more educated (at least graduate) were found to be more into drinking and drugs in comparison to those whose education was limited to school. Similarly, students of working mothers were more into alcohol and drug intake ($P < 0.05$). On multiple regression analysis, statistically significant ($P = 0.003$) students staying in a hostel (odds ratio [OR]: 2.57; 95% confidence interval [CI]: 1.3–4.8) had tried smoking in comparison to day-scholar.

DISCUSSION

The present study assessed the prevalence and determinants of substance use among Allied Health Sciences students, revealing important behavioral and socio-demographic patterns. The overall prevalence of smoking (10.03%), alcohol consumption (15.45%), and combined substance use (5.96%)

highlights a concerning trend among healthcare trainees, who are expected to serve as future health promoters.

The predominance of substance use among older students and those in advanced academic years suggests that **increasing age and academic exposure contribute significantly to risk behaviors**. This finding is consistent with previous studies, which report that substance use tends to increase with age due to greater independence, peer influence, and academic stress[8–10]. The observed rise in smoking and alcohol consumption among senior students reinforces the role of **environmental and psychosocial stressors** in shaping such behaviors[11].

Alcohol consumption was found to be more prevalent than smoking, aligning with earlier research conducted among medical and allied health students in India and globally[12–14]. This trend may be attributed to the **greater social acceptability of alcohol** compared to tobacco use, especially in academic and peer-group settings[15]. Additionally, the clustering of substance use behaviors, as demonstrated by the positive correlation between smoking and alcohol consumption, supports the theory that **risk behaviors often co-occur**, driven by shared psychosocial determinants[16].

The study also identified **hostel residence as a strong independent predictor of smoking behavior (OR: 2.57; p = 0.003)**. This finding is in agreement with previous literature, which indicates that students residing away from parental supervision are more likely to engage in substance use due to **increased autonomy, peer pressure, and reduced monitoring**[17–19]. Hostel environments may inadvertently facilitate exposure to substance use practices, thereby increasing vulnerability among students.

Interestingly, students with **higher parental education and working mothers** demonstrated a higher likelihood of alcohol and drug use. While this may appear counterintuitive, similar observations have been reported in earlier studies, suggesting that **greater financial independence, liberal attitudes, and reduced parental oversight** may contribute to such behaviors[20,21]. However, these findings should be interpreted cautiously, as cultural and contextual factors may influence these associations.

The early initiation of smoking and alcohol use, particularly in the **15–20 years age group**, is another critical concern. Early exposure has been linked to **long-term dependence and increased risk of chronic diseases**, including cardiovascular disorders, cancers, and mental health conditions[22,23]. This underscores the need for **early preventive interventions** targeting adolescents and young adults.

Awareness regarding tobacco-related health warnings was high (89.18%), yet only a small proportion (10.81%) had actively engaged with pictorial warnings. This gap between awareness and behavioral change has been widely documented, suggesting that **knowledge alone is insufficient to modify health behaviors**, and more interactive and behavioral interventions are required[24].

The findings of this study have important public health implications. Given that Allied Health Sciences students are future healthcare providers, their engagement in substance use may not only affect their

personal health but also influence their **professional credibility and ability to counsel patients effectively**[25]. Therefore, institutional policies focusing on **stress management, counseling services, and substance use awareness programs** are essential.

LIMITATIONS

This study has certain limitations. Being cross-sectional in nature, it does not establish causality. Self-reported data may be subject to reporting bias and social desirability bias. Additionally, the study was conducted in a single institution, which may limit the generalizability of the findings.

CONCLUSION

The study concludes that there is a definitive and palpable practice of “smoking, alcohol, and non-medicinal drug” consumption among professional students in a Allied Health Sciences college in Dehradun, Uttarakhand. It is noted that “ever” smokers, alcohol drinkers, or nonmedicinal drug consumers were 37 (10.03%), and 57 (15.45%) of students, respectively. Such practices were more prevalent among senior students including interns. The situation warrants continuous monitoring along with the implementation of multi-prolonged preventive measures.

Declarations

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. United Nations Office on Drugs and Crime International Day against Drug Abuse and Illicit Trafficking [Internet]. Vienna: UNODC; [cited 2026 Mar 17]. Available from: https://www.unodc.org
2. Nadkarni A, Tu A, Garg A, Gupta D, Gupta S, Bhatia U et al (2022) Alcohol use among adolescents in India: a systematic review. Glob Ment Health 9:e1–25. 10.1017/gmh.2021.48
3. World Health Organization Regional Office for Europe. Alcohol, e-cigarettes, cannabis: concerning trends in adolescent substance use [Internet]. Copenhagen: WHO (2024) [cited 2026 Mar 17]. Available from: https://www.who.int
4. World Health Organization. Over 3 million annual deaths due to alcohol and drug use, majority among men [Internet]. Geneva: WHO (2024) [cited 2026 Mar 17]. Available from:

https://www.who.int
5. World Health Organization. Tobacco [Internet], Geneva (2023) WHO; [cited 2026 Mar 17]. Available from: https://www.who.int
6. World Health Organization South-East Asia Region. Youth tobacco use and initiation patterns [Internet]. New Delhi: WHO-SEARO (2023) [cited 2026 Mar 17]. Available from: https://www.who.int
7. World Health Organization The tobacco industry is targeting youth [Internet]. Geneva: WHO; 2023 [cited 2026 Mar 17]. Available from: https://www.who.int
8. Gupta S, Sinha DN (2019) Tobacco use among youth in India. Indian J Public Health 63(2):45–52
9. Reddy KS, Gupta PC (2020) Report on tobacco control in India. Ministry of Health and Family Welfare, New Delhi
10. Arnett JJ (2000) Emerging adulthood and risk behavior. Am Psychol 55(5):469–480
11. Bansal RK et al (2018) Substance use among medical students. J Educ Health Promot 7:12
12. Kumar P et al (2017) Alcohol consumption patterns among college students. Int J Community Med Public Health 4(6):2105–2110
13. World Health Organization (2018) Global status report on alcohol and health. WHO, Geneva
14. Peltzer K, Pengpid S (2016) Alcohol use in university students. BMC Public Health 16:103
15. Room R et al (2005) Alcohol and social norms. Lancet 365:519–530
16. Jackson KM, Sher KJ (2015) Similarities of substance use behaviors. Psychol Addict Behav 29(3):708–715
17. Singh A et al (2019) Hostel living and substance use. Indian J Psychiatry 61(4):412–418
18. Verma R et al (2018) Parental influence on substance use. J Family Med Prim Care 7(2):345–350
19. Mishra A et al (2017) Socioeconomic factors and substance use. Indian J Community Med 42(3):150–154
20. Hanson MD (2014) Family structure and adolescent substance use. J Adolesc Health 55(4):468–474
21. Humensky JL (2010) Parental employment and adolescent risk behavior. J Adolesc Health 47(4):372–379
22. Centers for Disease Control and Prevention (2020) Youth risk behavior surveillance—United States, 2020. MMWR Morb Mortal Wkly Rep 69(1):1–83
23. World Health Organization (2017) Tobacco and its environmental impact: an overview. WHO, Geneva
24. Hammond D (2011) Health warning labels effectiveness on tobacco products. Tob Control 20(5):327–337
25. Frank E et al (2008) Health behaviors of medical professionals. JAMA 300(10):1251–1253