Journal of Engineering Education Transformations,
Volume No. 37, January 2024 Special Issue, eISSN 2394-1707

Engineering Students and Alcohol: Analyzing Consumption Patterns, Influencing Factors, and Implications (JEET)

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Abstract— **Understanding the complex landscape of alcohol consumption patterns among engineering students is crucial for shaping informed interventions and support systems. While prior research has primarily focused on aspects such as the prevalence of alcohol use and its consequences, there exists a significant gap in comprehensively exploring the underlying factors and implications. This research paper aims to bridge this void by exclusively addressing the intricate web of alcohol consumption within the engineering student demographic.The study delves into a multifaceted analysis that encompasses five paramount parameters: social influence, self-regulation, craving, coping strategies, and the environmental context. To achieve this, a meticulously designed survey instrument was deployed to engineering students at an autonomous college during the specified time frame. The collected data underwent rigorous exploratory factor analysis, resulting in the identification of five hypothesized factors that intricately define the landscape of alcohol consumption among engineering students.The reliability of this research instrument was validated through Cronbach's α values, which exhibited a range from 0.60 to 0.79 and had a minimum and maximum factor loading of 0.49 and 0.62 attesting to the robustness of the instrument. This valuable tool is poised to aid educational institutions in assessing their engineering students' current levels of awareness concerning alcohol consumption patterns and their underlying factors. Furthermore, it offers a foundation for evidence-based strategies aimed at fostering responsible drinking behaviors and tailored support systems, ultimately enhancing the well-being and academic success of engineering students.**

***Keywords*— Alcohol consumption patterns , engineering students , Social-influence , Self-regulation , Craving , Coping , Environmental context.**

***JEET Category*—Choose one: Research, Practice, or Op-Ed. (Please note, Op-Eds are by invite only. Refer to the Paper Submission and Review Guidelines for more details.)**

I. INTRODUCTION

Alcohol consumption is an ever-present aspect of college life, casting its influence over both individual well-being and academic performance. Yet, within the diverse tapestry of college students, engineering students stand apart, confronted by the daunting demands of their academic endeavors and the unique pressures inherent in their chosen field. This research embarks on an exploration of the intricate relationship between alcohol consumption and engineering students, endeavoring to unearth the factors, motivations, and consequences underpinning their drinking habits. By shining a spotlight on this distinct subset of the college population, our aim is to uncover insights that can illuminate the path toward tailored interventions and support systems. These insights are poised to enhance the well-being and success of engineering students during their academic journey and well into their future.

Furthermore, the cultural norms among these students consolidate beliefs that drinking is a shared behavior within their social milieu, coupled with a shared perception of the significance of alcohol in the university experience. Substance abuse among young adults and university students, including tobacco, alcohol, and illegal drugs,(Páramo 2020) has emerged as a pressing public health concern. Recent research paints a concerning picture, revealing a high prevalence of substance consumption among university students, particularly concerning illegal drugs(Delgado-Lobete, L.2020). The statistics suggest that this issue is not confined to a specific geography; rather, it extends to a global scale. Several factors contribute to this pattern, including students' expectations and their ability to navigate the competitive and challenging university environment(Credé,M.;2012). Transitioning to university life can be challenging, and those who struggle are at an elevated risk of substance abuse(Cobo-Cuenca, A.I.;2019) . Additionally, individual, family, and environmental factors interplay with risky behaviors in the context of higher education.

The region of the Americas, together with Europe, according to the World Health Organization reports (WHO, 2014), have the highest rates of alcohol consumption worldwide. A recent study by the Pan American Health Organization (PAHO), the WHO regional office for the Americas, includes Cuba among the countries that have the highest mortality rates due to causes attributable to alcohol, which reflects the harmful patterns of Consumption (CNCA, 2017).Such data show that in Cuba, alcohol is one of the most widely used addictive substances. Added to this is the increase in consumption among adolescents and young people, there is a significant decrease in the age of the first contact with this substance and an increasing incidence in the university context(Hernández et al.,2015, 2016), (Rodamilans et al., 2016), (Barandas, 2015).

Leave this section as is for the double-blind review process. Once accepted, you will be asked to make appropriate changes.
This paper was submitted for review on September, 10, 2023. It was accepted on November, 15, 2023.
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The largest scientific research on patterns of alcohol consumption comes from developed countries.
In the USA, since 1993, US university officials have acknowledged the behavior of binge drinking and its consequences, so they have directed more attention to these young people and conducted surveys and research on the risks in this young population(Estevez, A. G., 2018).

Understanding the intricate factors influencing alcohol consumption among engineering students holds broader implications for educational institutions, policymakers, and healthcare professionals. By delving into the nuances of this issue, we can develop strategies that promote responsible drinking habits and provide effective support systems tailored to the unique needs of engineering students, ultimately enhancing their overall well-being and academic success during their college years and beyond(Hope A. 2005). Additionally, these findings can contribute to the development of a healthier and more supportive campus environment, benefiting the entire educational community(Davoren, M. P.,2015).

This paper, therefore, seeks to address the intricate tapestry of alcohol consumption among engineering students while acknowledging its broader implications in the context of college life and the challenges faced by students as they navigate these environments assessing through various factors associated.

II. LITERATURE

The literature used to support the study talks about how much alcohol engineering students consume and what influences how much alcohol engineering graduates consume.Students' choices regarding alcohol intake may be affected by the independence and social pressures that frequently come with the transition to higher education. In order to build effective interventions and support systems for engineering students, it is crucial to comprehend the causes, drivers, and effects of their alcohol use. This study aims to provide a thorough understanding of this important topic by examining the factors influencing their drinking patterns, the potential effects on academic performance and mental health, and the larger implications on educational institutions and health practitioners.With this knowledge, we can start developing evidence-based measures to encourage responsible drinking and guarantee the all-around success of engineering pupils in their academic endeavors and beyond.

Understanding how peer pressure and societal standards affect drinking patterns among engineering students can be done by looking at social influence.Many people hold the view that those who drink do so in response to stress(Greeley, J.,1987). Conger (1956) formally put forth this idea as the tension-reduction hypothesis of alcohol use. In its most basic version, the tension reduction theory asserts that drinking alcohol lowers tension and that people do it in order to feel less stressed. As a result, being exposed to situations that cause tension (also known as stressors) should result in more drinking(Cooper, M. L., 1992).

Self-regulation examines how self-control and self-discipline relate to alcohol use. The alcohol industry has pushed self-regulation as a sufficient way to control alcohol marketing activities(.G. Hastings 2010).Evidence, however, indicates that the rules of self-regulatory alcohol marketing codes are routinely broken, leading to excessive juvenile exposure to alcohol marketing and the usage of potentially harmful content for children and other vulnerable populations. The goal and intent of these standards should be questioned if the alcohol sector does not follow its own regulations. In fact, the deployment of self-regulation for alcohol marketing in Brazil, the UK, and the US was more likely to delay statutory legislation than to advance public health(Noel, J., 2017) .

The psychological and physiological factors that fuel the impulse to drink are examined in Craving.In drug-dependent people, urges and cravings are subjectively experienced motivational states that are linked to ongoing drug use. They can also precede and hasten relapse episodes in addicts who are trying to stop using drugs. Historically, the term "craving" was used to describe the intense, nearly overwhelming urge for opiates that opiate-dependent individuals would suffer during acute withdrawal (Wikler, 1948). Later, it was used to describe the want to use any substance at any moment. The World Health Organization published a report in 1955 that distinguished between (i) non-symbolic craving, which was related to physiological withdrawal, and (ii) symbolic craving, which was related to loss of control and that associated with relapse (WHO, 1955). This was done in an effort to resolve the growing differences in opinions on alcohol craving. Despite the aforementioned redefinition, there was considerable debate regarding the relationship between craving and drug use and relapse (Sinha., 1999).

Coping mechanisms show how students may use alcohol as a coping mechanism for stress and unpleasant feelings.Alcohol is well known for its sedative effects, especially at higher blood alcohol concentrations (Pohorecky, 1977), and self-medication models of alcohol use suggest that the relief of distress plays a significant role in the development of alcohol use and related problems (Colder,2001). These calming pharmacological qualities may lead to drinking as a way to reduce tension, in accordance with the Tension Reduction theory (Conger, 1956) (Cappell & Greeley,1987). According to this theoretical paradigm, drinking outcomes and risk are both elevated in those who experience negative emotions and want to regulate them through alcohol.

Presumably, people who lack adaptive coping mechanisms (such as problem-focused tactics) are more likely to turn to heavy drinking while under stress, especially as a way to deal with unpleasant emotions. Their chance of developing alcohol-related issues consequently rises as a result of increased alcohol consumption. Existing research backs up this hypothesis because avoidant coping mechanisms are frequently linked to binge drinking and alcohol-related issues (Corbin, W. R.,2013).

A higher risk of regular excessive drinking has been linked to a number of individual traits. Both gender and race/ethnicity have different effects on frequent heavy drinking and its aftereffects (Caetano and Clark, 1998). Younger age, unemployment, being single, separated, or divorced, lower income, and lower educational attainment have all been linked to an increased risk of heavy drinking (Galvan and Caetano,2003). Additionally, attitudes regarding drinking seem to vary by gender and race/ethnicity (Bernstein, K. T.,2007).

The environment includes the settings and circumstances that contribute to binge drinking occasions, offering light on the contextual elements that affect alcohol consumption trends among the demographic of engineering students.Little is known about how environmental characteristics connected to drinking in bars and parties may vary both within and between contexts, despite the fact that some researchers have looked at environmental predictors of heavy drinking episodes reported by college students. For example, in a previous study (Clapp JD,2003), we found that the following factors were associated with heavy episodic drinking events: the number of intoxicated attendees, the availability of illicit drugs at the event, "bring your own beverage" (BYOB) events, and the presence of drinking games. However, we did not focus on the variations in settings as they linked to heavy drinking in our analyses. Bars and gatherings are likely to have particular environmental features that are related to alcohol consumption.

These factors encompass social influence, self-regulation, craving, coping, and the environment. By examining these multifaceted factors, we aim to provide a comprehensive analysis of alcohol consumption among engineering students and its implications.

III. METHODS

A quantitative approach has been chosen for this study after careful consideration of five factors influencing methodological selection. Initially, a comprehensive set of 30 items was used to elicit responses in order to assess different constructs across five factors: social influence (5 items), self-regulation (5 items), craving (5 items), coping (7 items), and environment (8 items). Targeting engineering professionals and students at an autonomous institute in South India, the instrument was administered electronically in the spring of 2023. The SPSS software was used for data gathering, and it was also used for analysis after that. Cronbach's alpha coefficients showed a range between 0.62 to 0.79, indicating a noteworthy level of coherence, for the internal consistency of the five dimensions (Binani, S., Shoeb, S., & Singh, T. A. 2023).

Conducting a survey is a useful and efficient way to learn more about alcohol use among engineering students. The survey instrument's design was inspired by a thorough literature analysis. It enables a thorough understanding of the factors impacting drinking habits among this particular group by allowing researchers to collect quantitative information from a large and diverse sample (Binani, S. 2022). The phase of data collecting took place in the fall of 2023. This poll was carefully designed to determine how several factors, such as social influence, self-control, craving, coping, and surroundings relate to alcohol use. The survey also includes specific demographic questions on the backgrounds of the students, covering topics like gender identity, age, current profession, and geography. The author painstakingly created a set of 30 related items and questions that are intricately tailored to evaluate the complex interactions between various factors affecting alcohol intake.

Table 1 presents an in-depth understanding of the item formulation process for each scale, effectively clarifying the fundamental essence of the variables and showcasing exemplar items. Survey participants were guided to appraise each variable using a Likert scale spanning from 5 (strongly agree) to 1 (strongly disagree). Through the incorporation of this evaluative approach, the authors adeptly conducted a meticulous analysis, delving into the noteworthy impact of diverse factors on alcohol intake.

TABLE I
OUTLINE OF FIVE CONSTRUCTS

Construct	Definition of Construct	Example Items
1.Social influence	This construct refers to the influence of social norms, peer pressure, and media messages on alcohol use. Prevention efforts targeting this construct might include public health campaigns that aim to change societal attitudes and behaviors towards alcohol consumption.	1. Do you think social media has an impact on alcohol use among young adults. 2. Do cultural and family attitudes affect alcohol intake.
2.Self-regulation	This construct refers to an individual's ability to control their own drinking behavior. Prevention efforts targeting this construct might include educational programs that teach individuals strategies for managing their own drinking.	1. Do you think self regulation is preventing alcohol intake? 2.Does self-regulation play a greater role in alcohol use among certain age groups.
3.Craving	This construct refers to the intense desire to consume alcohol that some individuals experience. Prevention efforts targeting this construct might include behavioral therapies or medications that help to reduce alcohol cravings.	1. Do you think that cravings for alcohol are more common in certain social situations or environments. 2. Do you ever experience strong cravings for alcohol?

4.Coping	This construct refers to the use of alcohol as a means of coping with stress, anxiety, or other negative emotions. Prevention efforts targeting this construct might include teaching individuals healthier ways of coping with stress, such as through exercise, meditation, or therapy.	1. Does intake of alcohol happens to express negative emotions. 2. Have you ever seen someone drinking alcohol to cope up with situations.
5.Environment	This construct refers to the physical and social context in which alcohol is consumed. Prevention efforts targeting this construct might include policies and regulations that limit access to alcohol, such as laws that restrict alcohol sales or prohibit alcohol consumption in certain public places.	1. Does advertising play a role in promoting alcohol consumption. 2. Does your workplace or social circle have a culture of heavy drinking.

IV. DATA ANALYSIS AND RESEARCH FINDINGS

TABLE II
PARTICIPANTS DEMOGRAPHIC INFORMATION/DATA

#	Category	N	%
	Total	533	100
	Gender		
1	Male	309	58
	Female	244	42
	Age		
	17-20	498	93.4
2	21-25	28	5.3
	26-30	2	0.4
	31 and above	5	0.9
	Current Profession		
	Student	524	97.1
3	Corporate	7	2.3
	Other	2	0.6
	Where do you stay		
4	Hostel	398	74.7
	Home	135	25.3

Table 3 presents the comprehensive descriptive statistics pertaining to all survey items employed in the study. An exploratory factor analysis methodology was undertaken in this research endeavor. To assess the appropriateness of items for factor analysis, Bartlett's test for sphericity was applied, with a significance level set at p=0.00. Additionally, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy, with a threshold of KMO 0.82, was employed to evaluate the variance captured by the extracted factors (Kittur, J., & Brunhaver, S. R. 2020, June).

Guidance for factor analysis was derived from multiple sources including parallel analysis, scree plots, and Kaiser's criterion. While parallel analysis of 5 factors and the scree plot /kaiser indicated the presence of eight factors. In alignment with the hypothesized number of factors, the decision was made to proceed with five factors. Given correlations exceeding 0.33 among the factors, the Promax rotation method was adopted (Kittur, J., & Brunhaver, S. R. 2020, June).

The conclusive factor loadings for the five identified factors are detailed in Table 4. Within Table 4, it is observed that four factors (items 1,2,8,9,11,17,24,30) demonstrated cross-loading on more than one factor > 0.3 (McNabb, D. E. (2020). Consequently, these 8 items were excluded from the analysis, resulting in a final compilation of four factors encompassing a total of 22 items.The factor loadings for factor 1 ranged from 0.49 to 0.47(3), while factor 2 exhibited loadings between 0.62 and 0.46(3). Similarly, factor 4 ranged from 0.46 to 0.36 (6), and factor 5 demonstrated loadings spanning to 0.50 to 0.53(5).The evaluation of internal consistency, as measured by the reliability coefficient Cronbach's α, showcased robust values ranging from 0.62 to 0.79, underscoring the strong reliability of the identified factors (Kittur, J., Coley, B. C., & Kellam, N. N. 2020, June).

TABLE III
STATISTICAL OVERVIEW OF FIVE CONSTRUCTS

#	Measure	Mean	SD
	Social Influence		
1	Social influence affects alcohol use.	2.2	0.9
2	I have felt pressured by my social circle to drink alcohol.	3.2	1.1
3	Social media has an impact on alcohol use among young adults.	2.2	0.9
4	Cultural and family attitudes affect alcohol intake.	2.5	1.0
5	I have witnessed someone drink more alcohol than they intended to due to social influence.	2.4	1.0
	Self-Regulation		
6	Do you think self-regulation is preventing alcohol intake?	2.2	0.9
7	Self-regulation plays a greater role in alcohol use among certain age groups.	2.2	0.8
8	Self-regulation skills can be developed or improved for alcohol intake.	2.5	0.9
9	Self-regulation skills can be developed or improved for alcohol intake.	2.7	1.0
10	I have seen someone successfully self-regulate their alcohol consumption in a challenging social situation.	2.4	1.0
	Craving		
11	I have experienced strong cravings for alcohol.	3.5	1.3
12	I think that cravings for alcohol are more common in certain social situations or environments	2.5	1.0
13	I think that craving plays a greater role in alcohol use among certain age groups.	2.2	0.9
14	I have seen someone successfully resist a strong craving for alcohol.	2.4	1.0
15	I think that education and awareness campaigns about the risks of alcohol use can be effective in reducing cravings for alcohol.	2.5	1.1
	Coping		
16	Intake of alcohol happens to overcome stress and anxiety.	2.6	1.0
17	Intake of alcohol happens to express negative emotions.	2.5	1.0
18	I intake alcohol to overcome loneliness.	3.5	1.3
19	I drink in order to paralyze/numb my feelings.	3.7	1.2
20	I have seen someone drinking alcohol to cope with situations.	2.4	1.0
21	I think coping is influencing alcohol use.	2.6	1.0
22	I have copied someone else's drinking behavior.	3.9	1.1
	Environment		
23	The environment affects alcohol use.	2.4	1.0
24	Social acceptance of alcohol consumption influences drinking behaviors.	2.4	0.9
25	Advertising plays a role in promoting alcohol consumption.	2.4	1.0
26	Laws and regulations around alcohol affect consumption.	2.8	1.0
27	My workplace or social circle has a culture of heavy drinking.	3.0	1.1
28	Alcohol intake feels more comfortable in social situations	3.2	1.0
29	I live in an area where alcohol is readily available, such as a city.	2.4	1.1
30	Advertising plays a key role in promoting alcohol consumption.	2.5	1.0

TABLE III
SURVEY INSTRUMENT ULTIMATE FACTOR LOADINGS

#	Measure	F1	F2	F3	F4	F5
	Social Influence					
3	Social media has an impact on alcohol use among young adults.	0.499				
4	Cultural and family attitudes affect alcohol intake.	0.427				
5	I have witnessed someone drink more alcohol than they intended to due to social influence.	0.477				
	Self-Regulation					
6	Do you think self-regulation is preventing alcohol intake?		0.628			
7	Self-regulation plays a greater role in alcohol use among certain age groups.		0.571			

10	I have seen someone successfully self-regulate their alcohol consumption in a challenging social situation.	0.469		
	Coping			
16	Intake of alcohol happens to overcome stress and anxiety.		0.465	
18	I intake alcohol to overcome loneliness.		0.366	
19	I drink in order to paralyze/numb my feelings.		0.409	
20	I have seen someone drinking alcohol to cope with situations.		0.554	
21	I think coping is influencing alcohol use.		0.570	
22	I have copied someone else's drinking behavior.		0.366	
	Environment			
23	The environment affects alcohol use.			0.508
25	Advertising plays a role in promoting alcohol consumption.			0.508
26	Laws and regulations around alcohol affect consumption.			0.388
27	My workplace or social circle has a culture of heavy drinking.			0.498
29	I live in an area where alcohol is readily available, such as a city.			0.539

V. CONCLUSIONS

Investigating and thoroughly comprehending the variables affecting alcohol intake among engineering students was the aim of this study article. This study has found important factors that influence alcohol consumption trends in this particular group by carefully analyzing survey data(Binani, S. 2022). According to study, students who live in dorms consume more than those who live at home.According to our research, a number of important elements, including peer pressure, stress reduction, a desire for integration into society, and the availability of alcohol, have an impact on engineering students' alcohol usage. With factors showing strong loadings and high Cronbach's alpha values ranging from 0.62 to 0.79 had a minimum and maximum factor loading of 0.49 and 0.62, the survey instrument utilized in this study demonstrated great validity and reliability. This tool has a great deal of potential to be used in a variety of educational settings, providing a useful tool to analyze and deal with alcohol-related difficulties among engineering students in-depth.

VI. IMPLICATIONS

The larger implications of this study include the engineering profession as a whole, legislators, healthcare providers, and educational institutions. The knowledge acquired from this research lays the groundwork for designing focused interventions to support engineering students and encourage safe drinking. We can dramatically improve the general well-being, academic achievement, and future prospects of engineering students throughout their college years and beyond by addressing the issues found in this study.In conclusion, this study is an important step in improving the environment for engineering students and ensuring their success in both their academic and personal life.

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