



Original Research

College Student Alcohol Use and Consequences: How Much Is Really Alcohol-Related?

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Abstract: Alcohol use is often viewed as a primary factor underlying negative consequences among college students. However, many of these commonly cited outcomes may also occur in the broader context of students' lives beyond alcohol use. This study examined nine unwanted consequences frequently associated with alcohol, comparing their occurrence when alcohol was involved and when alcohol was not involved. Data were drawn from undergraduate students participating in the *Alcohol101+* program during the 2023–2024 academic year. Analyses were conducted across three demographic factors, including gender, race/ethnicity, and fraternity or sorority affiliation, and by a drinking risk classification of lower-, moderate-, and higher-risk developed using proxy measures aligned with the AUDIT-C framework. Findings indicate that the relationship between alcohol and negative consequences is not uniform. Certain consequences, such as trouble with police or school, property damage, and injury, were more frequently associated with alcohol-related situations. Other consequences, including sadness or depression and academic challenges, were more commonly reported in situations without alcohol involvement. In addition, higher-risk students experienced greater levels of negative consequences overall, and the relationship between alcohol involvement and consequences was stronger within this group. These findings suggest that while alcohol remains an important factor in many harmful outcomes, it is not the sole context in which such consequences occur. A more comprehensive approach that considers the broader experiences of students, along with targeted attention to those at higher levels of risk, may help campus leaders to more effectively address unwanted consequences and support student success.

Keywords: *Alcohol Use, Alcohol Consequences, Harmful Outcomes, College Students, Student Success, Higher-Risk Students, Proxy Measures*

Background and Professional Literature

The use and misuse of drugs and alcohol by college students has been a long-standing concern of college administrators, community leaders, policy makers, and parents. While college student alcohol use—to a large extent, illegal behavior in the United States with underage drinking—is often viewed by many as a rite of passage, consequences occur that compromise students' academic and social engagement. College administrators and professionals are often challenged to address misuse of drugs and alcohol in meaningful ways.

Noteworthy is that rates of alcohol use, particularly heavier drinking, have reduced among traditional-age college students over the past fifteen years; this follows decades of

virtually no change (Patrick et al. 2025). Of concern, however, is that, over the last three decades, cannabis use over the previous thirty days continues to increase (Patrick et al. 2025). Other substances, including opiates, pose significant risks for college students. Freibott et al. (2024) report that, by sophomore year, nearly one-half of college students have been offered opioids for non-medical use. This is quite disconcerting, as fentanyl is present in counterfeit pills (Friedman and Hadland 2024). Further, students who experience any of these substance misuse or who have mental health issues may be less likely to know about or seek assistance from helpful campus services (Pasman et al. 2024).

Concerns voiced by college administrators typically emphasize students' behavior and consequences linked to substance misuse, rather than upon the actual use of alcohol, cannabis, and other substances. The most recent data (Anderson et al. 2024) from a longitudinal survey of campus chief student affairs officers reported that alcohol, specifically, is involved with 35% of residence hall damage, 36% of violent behavior, 27% of campus property damage, and 41% of campus policy violations. These administrators also note alcohol's involvement with individual concerns, citing 30% of violent behavior, 23% of suicide risk, and 45% of incidents of rape (Anderson et al. 2024). Academically, their assessment is that alcohol is involved with 15% of diminished performance on a test or project, and 15% of lack of academic success (Anderson et al. 2024). While these rates are all significantly reduced from the rates found four decades ago, alcohol's involvement remains a concern and a challenge. The National Institute on Alcohol Abuse and Alcoholism (Hingson et al. 2017) reports 1519 students dying every year due to alcohol-related causes. The American College Health Association, with its National College Health Assessment, gathers data on students' self-reported consequences related to drug and alcohol misuse. With the use of alcoholic beverages, 11% of the 40,325 student respondents reported health, social, legal, or financial problems related to their use over the last three months (American College Health Association 2025). Similarly, 9.7% of the 40,337 student respondents reported that, over the past three months, they failed to do what was normally expected because of their use of alcoholic beverages (American College Health Association 2025).

Relating students' heavy use of alcohol with unwanted and undesired consequences is an important consideration. Recent research documents that high intensity drinking (consuming ten or more drinks on one occasion) was higher among those who perceive slight or no risk of harm from binge drinking (Broman et al. 2025). Insights gathered by Smit et al. (2026), with a study on minority university students, revealed that anxiety sensitivity was a predictor for alcohol-related problems, yet not alcohol consumption. Examining consequences that may be caused by factors other than alcohol itself, including underlying social determinants of health and anxiety, is central to this research. Kenney et al. (2013) noted that research on the interrelationships among poor mental health, high-risk drinking, and other factors is lacking. In fact, an understanding of predisposing factors that increase students' risk of harm related to alcohol use is helpful for the design of appropriate interventions; a recent integrative literature

search (van der Wath et al. 2024) organizes these into physical, behavioral, psychological, and social risk factors. In addition, gender differences exist related to risk factors as well as one's potential progression toward heavy drinking, thus warranting attention to insights regarding males and females (Torres et al. 2026).

It is important that much of the data associated with students' use of substances and associated consequences focuses on the use of beverage alcohol and does not include the use of cannabis or other substances. While the use of substances other than alcohol will have an impact on these consequences and other outcomes, the relevance of a focus on alcohol for this current research is appropriate based on multiple factors. First, while all substances have cause for concern, cannabis and other drug misuse seem to occur in cycles, while alcohol misuse tends to be more resistant to change. Second, the authors were independent evaluators of a free online educational resource focusing specifically on alcohol and thus had access to a large data set of student responses. Third, any insights gathered with an alcohol-focused study would reasonably be applicable to all substances. Finally, research findings and implications can help inform future studies, analyses, and applications in ways that focus on the core needs.

To help reduce the harmful and undesired outcomes often associated with drugs and alcohol, numerous efforts at the national, state, and campus levels have been developed over the last half-century. The many resources and initiatives aid in planning and implementing appropriate strategies to help reduce substance misuse and the unwanted consequences. Increasingly used among college campuses, based on ease of implementation and student affinity for technology-focused strategies, are packaged educational resources. Recent findings (Kittaneh et al. 2026) regarding the effectiveness of a mobile application designed to moderate alcohol use are promising, thus substantiating the value of an assessment using a computer interface and as a potential component of a campus intervention. However, current efforts and resources are simply not sufficient, and perhaps not appropriate, for addressing—in more substantive and meaningful ways—outcomes and concerns surrounding alcohol misuse. It may be the case that these efforts, with their attention to drugs and alcohol specifically, do not encompass other influential factors. These other factors may be independent of the use of a substance and may exist even when involvement with drugs or alcohol does not exist. These factors may occur when drug or alcohol use occurs and thus may have other (non-substance-related) occurrences inaccurately ascribed to the use or misuse of substances.

Two research studies provide some foundation for examining this question. As reported by Hall (2016, 3), "Self-reported alcohol-related negative consequences might reflect a priori attitudes, beliefs, and behaviors unrelated to drinking." He also reported "little is known about non-alcohol related negative consequences" (120). He identified the need for a heightened understanding of those variables that affect consequences not related to alcohol use and might ultimately have an impact on both the outcomes and alcohol's involvement with them. Hall (2016, 138) states, "Prevention efforts only focused on alcohol-related harm fail to account for the same or similar harms that occur when actors are sober (e.g., missed

class, risk taking, or regretted sexual encounters)". A follow-on study (Flori 2023) compared the frequency of harms that occurred when individuals were sober with when they had consumed alcohol. With an aim of examining possible determinants of these consequences, the results found that the vast majority (over 87%) of the harms occurred more often while sober. Flori (2023, 64) reports: "Sober harms occur more frequently than alcohol-related harms even when accounting for alcohol use and may have unique predictors. Improving measurement of harms can lead to more targeted, specialized interventions aimed at improving harm reduction beyond changes in quantity and frequency of alcohol use." Further, Flori (2023, iii–iv) states, "These findings may explain the persistence of high rates of consequences reported in relation to alcohol use despite significant decreases in drinking following intervention. Future research should integrate risk and protective factors that predict all harms to better inform prevention/intervention strategies."

Coupling the desire to address students' harmful and/or unwanted consequences associated with drug/alcohol use, with the wide use of technological approaches, this research focused on students using one recently implemented, and free, online educational approach focusing on students' decisions about alcohol use—*Alcohol101+*. Based on the theoretical and practical foundations of this research cited, the overall aim was to gather a greater understanding of causal factors associated with students' alcohol use and related consequences. With insights garnered from this research, applications could reasonably be applied to cannabis and other substances.

Theoretical Framework and Research Questions

Central to college professionals' roles is that of providing the greatest opportunity for students to succeed. While the responsibility for actual success remains with individual students, campus faculty and staff seek to implement activities, policies, programs, and services that aid in this outcome. Simultaneously, campus faculty and staff seek to identify impediments and barriers to students' success academically and outside the classroom.

The commonly used epidemiological model, focusing on the agent, host, and environment, serves as a helpful theoretical construct for addressing student success (CDC 1978). With the focus on the environment, campus leaders can plan and implement policies, programs, and services that help influence students' outcomes; these may be supportive of student success or result in less desirable outcomes (such as those associated with drug and alcohol misuse). With the emphasis on the agent, attention is provided to the substance itself, including elements such as its content, availability, or method of use. The host is the emphasis on the individual, including their risk and protective factors, as well as those that might contribute to desirable as well as less desirable outcomes.

The model of the agent, host, and environment helps with understanding how specific strategies associated with drug and alcohol use can occur. It also helps with understanding

the implementation of this research design. Having a holistic examination of the individual (the host in this model) will be helpful with the development and implementation of strategies most appropriate for meeting the actual need.

Another key framework, the Socio-Ecological Model (Bronfenbrenner 1977) provides attention to the individual as well as the surrounding population as a whole. It helps with understanding and ultimately addressing the dynamic interactions and interrelations among various elements that affect individuals' behaviors. This model highlights that multiple influencers exist at different levels. First, the Individual level focuses primarily on knowledge, attitudes, and skills, including one's genetic background and constitutional history. The second is the Interpersonal level, with family, peers, mentors, and other relationships. Third, Institutional factors address school and workplace. Community is the fourth level, including the social and physical environment, activities, and local norms. Finally, Policy includes the larger structure of economics, health, education, societal mores, laws, rules, regulations, and procedures.

With the decades-long concern about substance misuse and related harms, an appropriate focus is on factors associated with unwanted consequences. A core question focuses on the extent to which these outcomes are caused by, exacerbated by, or related to the use of drugs or alcohol, or whether some of these identified harms are due to some other factors associated with the individual student. That is, some consequences might have arisen anyway with the students, or perhaps some consequences might have been exacerbated by the use of drugs or alcohol. The implication of this distinction is that, for some individuals, the consequence may actually be caused, primarily, due to a personal characteristic of the individual and not specifically by their use of a substance. The agent-host-environment model is useful, as with an aim of student success, having attention to only drug/alcohol issues (in each part of the model) may overlook other causal or contributing factors with the host component of the model. Similarly, the socio-ecological model helps with understanding the range of influences on a student, so that appropriate needs-based interventions can be designed and implemented.

Building upon these theoretical frameworks, three research questions emerge. First, to what extent are identified negative consequences associated with an individual's alcohol use? The sub-question is, when these consequences do occur, might there be other external factors related to their occurrence? Second, in what ways do these consequences (alcohol-related and not alcohol-related) differ based on key demographic factors? Third, in what ways do the negative consequences relate to an individual's risk classification for drinking (lower-, moderate-, and higher-risk)?

Methodology

Alcohol101+ is a free online alcohol education program developed by the Foundation for Advancing Alcohol Responsibility (FAAR), www.responsibility.org). Anchored in the Stages of Change Model (Prochaska and DiClemente 1983), the program highlights student knowledge, awareness of risk reduction strategies, and encouraging behavior change. When *Alcohol101+* was released in Fall, 2021, the developer embedded fifty-five questions in the program, primarily to provide tailored feedback to the students while they are using the program. The responses also provided campus administrators with data helpful for programmatic efforts. Some of the embedded questions focused on consequences linked to students' alcohol use and, as such, are directly relevant to this study. This resource was selected also because the researchers were successful with having additional questions incorporated that were parallel to the existing questions about alcohol-related consequences; these new questions complemented the existing questions and focused on consequences not related to alcohol.

This current research is based primarily on data gathered from these questions embedded in the *Alcohol101+* program. Student responses were collected over the 2023–2024 academic year, during which time *Alcohol101+* was implemented with 11,658 undergraduate students from seventy-six college campuses with five or more respondents each. Each of these students had previously provided the online program's sponsor, FAAR, with permission to use their anonymized data for research purposes. The anonymous responses from students were provided to the researchers by the program developer and were examined as group data only, with the ultimate aim of service improvement by campuses.

To pursue the research question surrounding consequences associated with alcohol use, the researchers started with the existing question, "What are some of the not-so-good things you have found to be true about your use of alcohol?" Following this, the new question added was, "On days when you were not drinking and did not have a hangover, did you experience any of these?" This new question had nine items, including behavioral, academic, and social consequences. The new question immediately followed the program's existing question on consequences and was available for completion by those who had some lifetime alcohol consumption. The presence of the additional question provided an opportunity to examine consequences reported by individuals both in alcohol-related situations and in situations without alcohol involvement. Having data from both questions and comparing the responses was intended to be helpful in examining how these consequences are experienced across different contexts.

Analysis of results was conducted based on two overall constructs. One of these included three demographic factors embedded in the program: gender, fraternity or sorority affiliation, and race/ethnicity. The other was based on a student's reported alcohol use, including frequency, number of drinks, and binge drinking behavior, and resulted in a drinking risk

construct. Both the demographic factors and the drinking risk construct were used to examine how patterns of consequences varied when alcohol was and was not involved.

This drinking risk construct was developed by adapting the three questions in the AUDIT-C measure (Bush et al. 1998), a validated assessment tool widely used to identify students of concern regarding alcohol use. The AUDIT-C assessment focuses on frequency of use, quantity of consumption, and binge drinking behavior. Having an assessment that uses multiple measures is particularly helpful, as it does not rely on a single indicator but instead uses a composite of related behaviors.

For each of the questions included in the AUDIT-C, a summary score is created based on the individual’s response to the three questions. This summary score has a range from 0 to 12 and has its assessment based on gender; for males, scores of 4 or more are considered positive, and for females, scores of 3 or more are considered positive. The AUDIT-C developers suggest that a positive score (i.e., 4 or higher for males and 3 or higher for females) may be helpful for identifying individuals who may have “hazardous drinking or active alcohol use disorders.”

For this research, a proxy for the AUDIT-C scores and assessment was developed using three existing variables within *Alcohol101+*, as these were closely aligned with the three variables in the AUDIT-C instrument. Regarding a student’s alcohol use, response options included “never,” “within the last month,” “last year,” and “long ago.” A second variable addressed the number of drinks consumed during the most recent alcohol use; the third variable assessed binge drinking behavior. Table 1 illustrates the development of this proxy with the wording for the questions and response choices used with both the AUDIT-C and *Alcohol101+*.

Table 1: Development of High-Risk Scores Using AUDIT-C

ALCOHOL USE			
<i>AUDIT-C</i>		<i>Alcohol101+</i>	
How often do you have a drink containing alcohol?		When, if ever, was the last time you drank alcohol?	
AUDIT Scale	AUDIT Score	<i>Alcohol101+</i> Responses	High-Risk Score
Never	0	Never or Long Ago	0
Monthly or less	1	Year	1
2–4 times a month	2	Month	2
2–3 times per week	3		
4 or more times a week	4		
NUMBER OF DRINKS			
<i>AUDIT-C</i>		<i>Alcohol101+</i>	
How many drinks containing alcohol did you have on a typical day when you were drinking in the past year?		To the best of your ability to recall, the last time you drank alcohol, how many drinks did you have?	
AUDIT Scale	AUDIT Score	<i>Alcohol101+</i> Responses	High-Risk Score

1-2	0	1-2	0
3 or 4	1	3 or 4	1
5 or 6	2	5 or 6	2
7 to 9	3	7 to 9	3
10 or more	4	10 or more	4
“BINGE” DRINKING			
<i>AUDIT-C</i>		<i>Alcohol101+</i>	
How often did you have six or more drinks on one occasion in the past year?		Over the last two weeks, how many times have you had five or more drinks (for males)/four or more drinks (for females) containing any kind of alcohol within two hours?	
AUDIT Scale	AUDIT Score	<i>Alcohol101+</i> Responses	High-Risk Score
Never	0	0	0
Less than monthly	1	n/a	n/a
Monthly	2	1	2
Weekly	3	2-5	3
Daily or almost daily	4	6-10	4

With the linkage identified between *Alcohol101+* and AUDIT-C scales, the maximum score with the High-Risk classification is 10, since the alcohol use frequency variable does not have any response choices that could be coded as 3 or 4, as is found with the AUDIT-C. While the scales of the AUDIT-C and those found in the *Alcohol101+* program are not identical, they are quite similar. The parallelism between these measures provides an approximation helpful for developing a composite score using the data from *Alcohol101+*. This composite score serves as a reasonable approach for examining differences in consequences across varying levels of drinking risk. Table 2 summarizes these three components that were combined to create a composite drinking risk measure.

Table 2: Summary of Drinking Risk Classification Based on AUDIT-C Framework

<i>Component</i>	<i>AUDIT-C Measure</i>	<i>Alcohol101+ Item</i>	<i>Scoring</i>
Alcohol use frequency	Frequency of drinking	Time since last drink	0-2 scale
Number of drinks	Typical number of drinks	Number of drinks at last use	0-4 scale
Binge drinking	Frequency of heavy drinking	Number of binge episodes	0-4 scale

Risk categories were defined using gender-specific thresholds adapted from the AUDIT-C framework. Based on these measures, students were classified as Lower Risk, Moderate Risk, or Higher Risk. For females, those with a score of 0 to 2 were rated as Lower Risk; scores

of 3 to 5 were Moderate Risk; and scores of 6 or higher were Higher Risk. For males, Lower Risk included scores of 0 to 3, Moderate Risk was 4 to 6, and Higher Risk was 7 or greater. While not identical to the AUDIT-C instrument, these measures closely approximate its key components and provide a reasonable basis for classifying drinking risk.

To address the research questions, the analysis focused on comparing consequences reported in alcohol-related situations with those reported in situations without alcohol involvement, while accounting for differences across individuals and levels of drinking risk. The data were structured to allow for repeated observations within individuals across both contexts and consequence types. A mixed-effects logistic regression model was used to examine the occurrence of individual consequences while accounting for repeated observations within individuals across contexts and consequence types. In addition, a binomial mixed-effects model was used to examine the total number of consequences reported. This approach allows for the examination of multiple outcomes while accounting for within-person correlation.

Race/ethnicity and fraternity or sorority affiliation were evaluated in preliminary analyses; however, their inclusion did not fundamentally alter the primary associations and were therefore not retained in the final models. Both sets of consequences questions were asked only of those who had consumed alcohol at some point in their lives; lifetime non-users did not receive these questions. While this represents a limitation, it reflects the original design of the *Alcohol101+* program. The final analytic sample included 8078 students.

Results

A total of nine consequence items were examined based on their occurrence. These were reviewed in alcohol-related situations as well as in situations when alcohol was not involved. A descriptive comparison of these consequences provides an initial understanding of how these outcomes are experienced across contexts (Table 3).

Table 3: Prevalence of Consequences by Alcohol Context

<i>Consequence</i>	<i>Wording in Survey</i>	<i>No Alcohol (%)</i>	<i>Alcohol (%)</i>
Depressed	I felt sad or depressed	24.9	14.4
Disappointed	I disappointed friends	9.2	6.4
Embarrassed	I embarrassed myself	28.7	26.5
Property damage	I damaged property	2.1	2.9
Academic problems	I missed class or did poorly on a school assignment	26.7	8.4

Hurt self or others	I hurt myself or someone else	2.6	3.2
Bad decision	I made a decision I wouldn't usually make	21.4	21.3
Police trouble	I got in trouble with the police	1.3	2.6
School trouble	I got in trouble with school	4.8	10.8

Several consequences were more frequently reported in situations without alcohol involvement. Missing class or performing poorly on an academic assignment was reported by 26.7% of students in non-alcohol contexts compared with 8.4% in alcohol-related contexts. Feeling sad or depressed was also more frequently reported in non-alcohol contexts (24.9%) compared with alcohol-related contexts (14.4%).

In contrast, other consequences were more frequently associated with alcohol-related situations. These included police trouble (2.6% compared with 1.3%), school trouble (10.8% compared with 4.8%), and property damage (2.9% compared with 2.1%). Making a bad decision and embarrassment occurred at relatively similar rates across both contexts. These descriptive findings indicate that the relationship between alcohol use and negative consequences varies across different types of outcomes.

To better understand these patterns, mixed-effects regression models were used to examine both the likelihood of individual consequences and the total number of consequences reported, while accounting for repeated observations within individuals, contexts, and consequence types. Results from the mixed-effects logistic regression model (Table 4) indicated that alcohol context was significantly associated with the likelihood of experiencing consequences ($OR = 0.422$, $p < .001$). However, this relationship varied by consequence type. Behavioral outcomes, such as police trouble, school trouble, property damage, and injury, were more likely to occur in alcohol-related contexts, whereas emotional and academic outcomes were more common in non-alcohol contexts.

Table 4: Mixed-Effects Logistic Regression Predicting Individual Consequences

<i>Predictor</i>	<i>Odds Ratio</i>	<i>p-value</i>	<i>95% CI</i>
Alcohol context	0.422	<.001	[0.385, 0.463]
Moderate-risk	1.150	<.001	[1.080, 1.225]
Higher-risk	1.267	<.001	[1.184, 1.356]
Alcohol × Moderate-risk	1.130	.003	[1.043, 1.225]
Alcohol × Higher-risk	1.408	<.001	[1.293, 1.532]
Male	0.936	.003	[0.896, 0.978]

Note: The model includes student-level random intercepts to account for repeated observations.

Drinking risk was also a significant predictor. Compared with lower-risk students, those in moderate-risk (OR = 1.150, $p < .001$) and higher-risk categories (OR = 1.267, $p < .001$) had greater odds of experiencing consequences overall. In addition, interaction effects indicated that the association between alcohol involvement and consequences was stronger among higher-risk students (OR = 1.408, $p < .001$).

Results from the binomial mixed-effects model predicting the total number of consequences (Table 5) showed a similar pattern. Alcohol-related contexts were associated with a lower overall number of reported consequences ($\beta = -0.397$, $p < .001$), reflecting the fact that emotional and academic outcomes, more prevalent overall, were more commonly reported in non-alcohol contexts. However, moderate- and higher-risk students reported significantly more consequences overall, and interaction effects again indicated that alcohol-related consequences were more pronounced among higher-risk groups.

Table 5: Binomial Mixed-Effects Regression Predicting Total Number of Consequences

<i>Predictor</i>	<i>Coefficient (β)</i>	<i>p-value</i>	<i>95% CI</i>
Alcohol context	-0.397	<.001	[-0.448, -0.347]
Moderate-risk	0.123	<.001	[0.066, 0.179]
Higher-risk	0.206	<.001	[0.145, 0.267]
Alcohol \times Moderate-risk	0.120	.002	[0.044, 0.196]
Alcohol \times Higher-risk	0.322	<.001	[0.243, 0.402]
Male	-0.058	.003	[-0.098, -0.019]
Intercept	-1.968	<.001	[-2.010, -1.927]

Note: Coefficients represent changes in the log-odds of reporting a greater number of consequences (0-9). The model includes student-level random intercepts.

Predicted values from the binomial mixed-effects model were used to estimate the expected number of consequences students would report across alcohol contexts and levels of drinking risk (Table 6). While descriptive results (Table 3) show the overall prevalence of consequences, they do not account for differences across individuals or the repeated measurement of outcomes across contexts. The regression model addresses these factors, and predicted values translate the model's log-odds coefficients and interaction effects into more interpretable, real-world estimates. These values represent model-adjusted averages that isolate the effects of alcohol context and drinking risk while accounting for within-person correlation.

Table 6: Predicted Number of Consequences by Alcohol Context and Drinking Risk

<i>Risk Level</i>	<i>No Alcohol</i>	<i>Alcohol</i>
Lower-risk	1.08	0.75
Moderate-risk	1.20	0.94
Higher-risk	1.29	1.21

The results indicate that students in higher-risk categories experience more consequences overall in both the alcohol-related and non-alcohol contexts. In non-alcohol contexts, lower-risk students are predicted to report approximately 1.08 consequences on average. However, among higher-risk students, this was approximately 1.29 on average.

In alcohol-related contexts, the expected number of consequences increases more sharply with risk, from 0.75 among lower-risk students to 1.21 among higher-risk students. Notably, the difference between alcohol-related and non-alcohol contexts becomes smaller as risk increases. Among lower-risk students, fewer consequences are expected in alcohol-related situations than in non-alcohol situations. However, among higher-risk students, the number of consequences is similar across both contexts. This pattern suggests that alcohol plays a more substantial role in contributing to negative consequences among higher-risk students, while lower-risk students are more likely to experience consequences in non-alcohol contexts.

Summary Findings

The review of the data regarding consequences demonstrates several findings. This research provides a more refined understanding of the role of alcohol in negative consequences among college students. The relationship between alcohol use and unwanted outcomes is not uniform and varies by outcome and level of drinking risk.

Overall, with few exceptions, the frequency of consequences increases as the risk category becomes higher; this is the case for situations with and without alcohol use. While this stepped-up consequence pattern varies by consequence, the overall pattern is clear that those with higher alcohol risk ratings show greater involvement with unwanted consequences. Specifically, students in higher-risk categories reported greater levels of negative consequences overall. The relationship between alcohol involvement and consequences was also stronger among these students, suggesting that alcohol-related harms are concentrated among higher-risk individuals.

Notably, differential rates of certain consequences are found in situations based on alcohol consumption. Emotional and academic consequences were more frequently reported in non-alcohol contexts, while behavioral consequences such as police trouble, school trouble, property damage, and injury were more strongly associated with alcohol-related situations. These findings indicate that some concerns commonly linked to alcohol use are also present in students' broader experiences, while other harms are more closely associated with alcohol-related contexts. Further, while early descriptive differences are noted based on the three demographic factors reviewed, their inclusion did not alter the primary associations and were thus not retained for the models included here.

Based on these overall findings, the initial three research questions are reviewed. The first one examined the extent to which consequences are associated with one's alcohol use. As noted, some consequences are higher without alcohol's involvement, and others are higher

with alcohol. The second question addressed differential outcomes based on demographic factors. These did not affect the main associations found. The third question examined the impact of a student's drinking risk classification. This found an increased number of consequences overall, including alcohol-related and non-alcohol situations.

Discussion

This research offers an examination of factors associated with college students' use of alcohol in a way that extends beyond traditional approaches. Of great concern to campus leaders are various unwanted behaviors, such as harm to self or others, property damage, public disturbance, and thwarted academic performance; these behaviors, among others, are unwanted regardless of the causal factors. For many of these and other behaviors, alcohol appears to be a contributing factor. However, many of these same outcomes do occur without alcohol's involvement. While alcohol use is not the singular cause for negative consequences, of particular interest is that the data indicates sadness and depression are more prevalent sober than after drinking. Similarly, academic problems are found three times more often in situations without alcohol than with alcohol. Of significant importance is the relationship between one's alcohol risk classification (lower, moderate, and higher-risk) and the nature and number of unwanted consequences, whether or not alcohol was involved. For the individuals with a higher-risk classification, the alcohol usage behaviors that comprise the alcohol risk factor may, in fact, be a result of—rather than the cause for—whatever is contributing to the unwanted consequence.

This research sought to take a closer look at selected behaviors of concern often cited as central to campus prevention efforts. These findings are consistent with the agent–host–environment framework and the socio-ecological model, which emphasize multiple influences on behavior. For example, the agent, host, and environment model helps campus efforts focus on the agent (alcohol) and the environment (policies, procedures, education) and the host (student). Using this model with a focus on alcohol-related consequences may, while important, overlook some of the developmental or other factors with the student. The Socio-Ecological Model which helps with understanding the broader context within which any behavior (alcohol-related or without alcohol involvement) is found. This research suggests that many of the consequences may occur independent of a student's alcohol use; thus, attention to the entire student and their interpersonal and community surroundings necessitates further attention to the environment as well as other “agents” that can affect the unwanted consequences. Alcohol can be understood as one contributing factor among several that interact to influence student outcomes. Campus leaders will benefit from looking at other “agents” that contribute to and help reduce the unwanted consequences. Consider, for example, assistance with study skills and time management, and the provision of suitable space and support materials, to aid with the academic-focused consequence. Consider also

strategies to promote mental health and well-being at the individual and environmental level, approaches to identify signs of mental distress or concerns within oneself and others, strategies to encourage caring engagement and referral, and resources for support and remediation as needed.

Targeted approaches may be particularly important. Students with higher levels of drinking risk experience greater levels of harm and are more affected by alcohol-related contexts. Prevention and intervention strategies may benefit from prioritizing this group while also addressing academic and emotional challenges.

The global finding from all the results associated with consequences is that, from an overall perspective, students experience the consequences in their general lives, even when alcohol is not involved. The conclusion is that these issues and concerns are part of the students' lives. As such, these consequences may be caused by other factors, such as their overall life, their living situation, their relationships, their community feeling, their mindset and view, or other factors.

Implications for Research and Practice

These findings have implications for how alcohol-related harms are addressed on college campuses, both for research and practice. Alcohol remains an important factor, particularly for certain behavioral outcomes, but it does not explain all consequences. A broader understanding of student experiences may be needed, one that considers both alcohol-related and non-alcohol contexts.

It is important for college leaders to examine how various traits, such as personality or developmental factors, can be identified and addressed. It may be the case that, in fact, traits such as sadness, depression, personality disorders, and risk-taking have an impact on student behavior and, thus, unwanted consequences and harm. While alcohol (and other drug) use can affect and exacerbate existing attributes, these traits may, in fact, have a larger role than alcohol in explaining the presence of unwanted consequences. For example, the use of mood-altering substances (such as alcohol, cannabis, and other drugs) may exacerbate a lack of empathy, but they do not cause a lack of empathy. It may be that interpersonal traits that lead to unwanted consequences are pre-existing, and that an individual's use of alcohol is a response to or a means of coping; it may also be that one's alcohol use provides "permission" to drop one's guard and exhibit problematic behavior normally controlled by role definition at work and school.

A more detailed examination—both with campus applications as well as research—is particularly warranted among those students identified as higher-risk drinkers. The fact that overall harms (alcohol-related and non-alcohol) are elevated among higher-risk drinkers indicates these individuals are a unique group and thus warrant differential attention. With their common experience with risk-taking, and sadness/depression, campus policies and

services would be well-served to address these and related factors among this group of students. This would require appropriate assessments (such as the AUDIT-C) to identify and then intervene with individuals as needed and identified, and then to provide needs-based services and resources, thus serving as a type of early intervention.

In addition, further examination of factors underlying sadness and depression, in particular, would be warranted, particularly as these relate to individuals' social connections and, perhaps, alcohol expectancies. Individuals feeling less connected to others or a peer group may be an important variable in addressing both sober and alcohol-related harms. Alcohol expectancies fuel the desire to drink more despite the consequences because drinking together is being together. Higher risk drinkers may feel isolated or alone in general and take risks or lack judgment in managing others/relationships. Not only does this also warrant early identification strategies (assessment and referral), but it also provides a reasonable rationale for promoting greater community, quality interpersonal relationships, human relationship skills, and overall connectedness among individuals and groups.

For future research, it will be most helpful to further refine the instrumentation regarding classifications around higher-risk use of substances. This study used a convenience sample of students and was based on the students already using the free online resource. By gaining permission to add parallel questions regarding consequences, and by creating a reasonable proxy for higher risk alcohol use, the researchers were successful in gathering new insights regarding a long-standing societal concern surrounding alcohol use and unwanted consequences.

To aid future research, the assessment of drinking risk should, ideally, include the actual AUDIT-C measures, replacing the proxy measure used for this study. Further, the examination of unwanted consequences should make the questions the same for both the alcohol-involved and alcohol-not-involved situations. In particular, it may be helpful to incorporate a time factor (e.g., within the last week, month, and/or year) regarding the occurrence of unwanted consequences. In addition, the research sample should also include those who do not consume alcohol to help serve as a comparison group for consequences. Also beneficial would be parallel research on the involvement (and non-involvement) of cannabis, as well as other drugs with unwanted consequences.

Another future orientation, due to the increasing utilization of technology and applications for a range of issues, is the encouragement of the developers of *Alcohol101+* as well as the developers of similar online education and intervention programs, to incorporate relevant and valid assessment scales. These scales would be helpful to assess one's alcohol use, consequences related and unrelated to alcohol use, and other potentially relevant factors. Findings from these scales would help both with research, assessment of campus need, and campus services. Campus leaders who conduct their own assessments on campus are encouraged to include similar measures and assessment considerations in their own evaluation and research processes. Further, campus leaders may also take the national data

from this study, other online programs, or their own campus assessments, and engage in qualitative assessments, such as with focus groups, discussion groups, interviews, and open-ended online response opportunities. These qualitative approaches can help inform an understanding of why differences exist among various audiences (including, yet extending beyond, those identified in this article) as well as to identify meaningful and potentially impactful interventions, resources, and services.

Most important, and resulting from this research, is the importance of not “blaming” students’ use of alcohol for the numerous unwanted and/or undesirable consequences that occur. Further, many believe in the magical power of “alcohol made me do it” rather than “I chose to do it”; this is an idea that seems to permeate the discussion of harms. This research requires the suspension of disbelief in the historical narrative of “bad things happen when people drink too much.” While alcohol and other drugs do have documented risks and association with some harmful or negative consequences, many of those same consequences exist—and sometimes to a greater degree—without the use of a substance. What is most important is to understand, and then address, the life events and circumstances facing the lives of students on their campuses.

Limitations

While this study holds great promise for a reconceptualization of how consequences associated with college student alcohol use are viewed, several limitations are inherent with the current research design. While the sample size was large, the respondents are not necessarily representative of college students nationwide. College campuses use *Alcohol101+* for various reasons, whether as part of a sanction associated with a conduct violation, an early intervention approach with a fraternity or sorority, a class assignment, a requirement for first year students, or some other purpose. Having an even broader set of data from which to draw—and particularly if that data set was a fully representative data set, or even an entirety of a population (e.g., all first-year students) would help with further grounding and validation of the findings overall and for the various sub-analyses.

Another limitation has to do with the self-report nature of all responses, typically prepared in the privacy of their own home or setting. Further, as noted, the designation of the level of risk for individuals was based on the questions embedded in the *Alcohol101+* program, from which a reasonable proxy was developed. More ideal would be to use the existing questions from the AUDIT-C or another validated scale.

An additional limitation revolves around the inability to compare consequences that were not related to alcohol use between those who do consume alcohol and those who have never consumed alcohol (as this latter group was not queried on any alcohol-related question). Finally, the consequences questions, while typical for many alcohol and drug use surveys, were limited to this specific online program, and based on the ability of the

researchers to have these comparison consequences questions embedded in the program and offered by the developers of *Alcohol101+*; similar queries with other online programs would be helpful. While these limitations exist, their presence does not hinder the great significance of many of the findings and thus warrants attention for future research endeavors and campus applications.

Conclusion

The findings from this research are helpful for better understanding the context of alcohol in the lives of college students. The results from questions about consequences students experience that are unrelated to alcohol are interesting, particularly when examined through the lens of a student's drinking risk classification. Clearly, as an individual's drinking risk classification becomes higher and more hazardous, the impact with increased unwanted consequences is more extensive. Another finding is that so many issues (often labeled as "negative consequences") associated with students' use of alcohol exist (and often to a greater extent) in students' lives overall. Many of these unwanted consequences do occur at increasingly higher rates based on one's drinking risk classification, even when alcohol is not involved. What occurs all-too-often is that alcohol consumption is cited (or "blamed") as responsible for the consequences. While alcohol use may be a contributing factor associated with these consequences, it is also important to note that, to some extent, some of these factors exist anyway without the use of alcohol and may be due to other factors in a person's life. And while alcohol use may exacerbate the occurrence of these consequences, the unwanted consequence may actually be caused by factors other than alcohol use.

Broadly speaking, it is hoped, as college campus leaders promote healthy, safe, and productive environments for college students, they will seek a broader understanding of the factors that contribute to and impede these outcomes. It is hoped that campus leaders examine the protective influence of positive social connections for students and the community. Further, it is hoped that current and new findings will help inform many of the conversations about alcohol and how it is dealt with among college students and young adults.

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The authors declare that generative AI or AI-assisted technologies were not used in any way to prepare, write, or complete this manuscript. The authors confirm that they are the sole authors of this article and take full responsibility for the content therein, as outlined in COPE recommendations.

Informed Consent

This study was conducted with the informed consent of all participants.

Conflict of Interest

The authors declare that there is no conflict of interest.

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