

Substance Misuse in the College Environment: Understanding Outcomes and Associated Factors

About 40% of young adults living in the United States enroll in colleges every year.¹ Although a small number of these students continue to live at home while attending school, most move away and live independently during their first year of college. A majority of these students find themselves in an environment that places them at increased risk for a variety of substance misuse² and mental health problems.³

Despite this increased risk, prevention practitioners have limited information about specific substance misuse and mental health problems college students experience and specific college-related risk and protective factors associated with these problems.

To identify these problems and associated risk and protective factors, epidemiologists working with SAMHSA's Center for the Application of Prevention Technologies (CAPT) conducted a systematic review of peer-reviewed literature published between 2000 and 2014. The goal of this review was to identify:

- Specific substance misuse and mental health problems associated with the college environment;
- Specific college-related factors that place students at increased risk for, or protect against, substance misuse and/or mental health problems; and
- Which, if any, risk and protective factors are associated with *both* substance misuse and mental health problems.

This fact sheet provides an overview of our findings.

¹ School Enrollment. Retrieved August 26, 2016, from <http://www.census.gov/hhes/school/data/cps/historical/index.html>. Table A-5a.

² Substance misuse: Use, abuse, and dependence of alcohol, illicit drugs, and prescription medications.

³ Mental health problem: Mental illnesses and/or conditions associated with substance misuse patterns (e.g. depression, suicides, anxiety).

OUR APPROACH

We used the following three search terms to guide our review:

- **College-related factors**, which included factors associated with college life (e.g., norms, culture), living arrangements (e.g., living on campus), and overall college experience (e.g., student grades);
- **Substance misuse**, defined as consumption of alcohol, illicit drugs, and prescription medications (e.g., binge drinking, nonmedical use of prescription drugs); and
- **Mental health problems**, defined as mental illnesses and/or conditions predominantly associated with substance use patterns such as depression and suicide.

Using these terms, our search produced 688 studies. On reviewing these studies, we identified 88 that included factors associated with at least one substance misuse or one mental health problem. A full-text review of these 88 studies revealed the following:

- Thirteen **substance misuse** and two **mental health problems** associated with college-related factors;
- Eight **protective factors** associated with substance misuse or mental health problems;
- Ten **risk factors** associated with substance misuse or mental health problems; and
- Six risk and protective factors associated with both substance misuse and mental health problems (that is, **shared risk and protective factors**).

These findings are presented in detail below.

OUR FINDINGS: SUBSTANCE MISUSE AND MENTAL HEALTH PROBLEMS

Our literature search identified thirteen substance misuse-related outcomes and two mental health problems associated with college-related factors. The fifteen outcomes identified by our research literature were:

- Alcohol use
- Binge drinking
- Drunkenness
- Heavy alcohol use
- Quantity of alcohol consumed
- Ecstasy use
- Illicit drug use
- Marijuana use
- Quantity of marijuana use
- Nonmedical use of prescription drugs (NMUPD)
- Nonmedical opiate/opioid use
- Nonmedical tranquilizer use
- Nonmedical stimulant use
- Anxiety
- Suicidal ideation

Table 1 presents these outcomes, the identified risk and protective factors associated with each, and the number of studies that found the association to be statistically significant. We found college-related factors were associated most frequently with the following problems:

- Binge drinking (41 studies)
- Quantity of alcohol consumed (21 studies)
- Alcohol use (13 studies)
- Suicidal ideation (7 studies)

It was interesting to note that while our review did, to some extent, identify problems such as illicit drug use, prescription drug misuse, and anxiety, the college environment was predominantly associated with alcohol misuse, and in particular, high-risk drinking patterns like binge drinking and high quantity of alcohol use.

Table 1. Substance Misuse and Mental Health Problems Associated with Factors in the College Environment

Problem	Number of studies	Risk and protective factors associated with substance misuse and mental health problems
Binge drinking	41	<p><i>Risk factors:</i> Attending college, average or poor academic performance, Greek membership/affiliation, participation in college athletics/sports, participating in sport-related social events, living arrangements while in college (on campus substance-free housing, on campus single sex female housing, with parents/guardians/family/partner/spouse, outside campus community)</p> <p><i>Protective factors:</i> Academic achievement, attending faith-based institution, involvement in student organizations, perceived college sanctions for alcohol policy violations, living arrangements while in college (on campus, on campus residence hall, with roommates, off campus, in an uncontrolled environment); participation in campus activities</p>
Quantity of alcohol consumed	21	<p><i>Risk factors:</i> Greek membership/affiliation, intention/participation in study abroad program, multiple student leadership roles, participation in college athletics/sports, participating in sport-related social events, living arrangements while in college (on campus, on campus residence hall, off campus)</p> <p><i>Protective factors:</i> Attending faith-based institution, perceived college sanctions for alcohol policy violations, out of state student status, living arrangements while in college (on campus co-ed floor)</p>
Alcohol use	13	<p><i>Risk factors:</i> Academic stress, Greek membership/affiliation, living arrangements while in college (away from home, off campus, on campus residence hall)</p> <p><i>Protective factors:</i> Attending faith-based institution, involvement in student organizations, living arrangements while in college (on campus co-ed floor)</p>
Suicidal ideation	7	<p><i>Risk factors:</i> Average or poor academic performance</p> <p><i>Protective factors:</i> Academic achievement, participation in campus activities, participation in college athletics/sports, living arrangements while in college (with parents/guardians/family/partner/spouse, on campus residence hall)</p>
Illicit drug use	6	<p><i>Risk factors:</i> Greek membership/affiliation, participation in college athletics/sports, living arrangements while in college (on campus housing, off campus)</p> <p><i>Protective factors:</i> Academic achievement</p>

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Problem	Number of studies	Risk and protective factors associated with substance misuse and mental health problems
Nonmedical use of prescription drugs	6	<p><i>Risk factors:</i> Academic stress, average or poor academic performance, Greek membership/affiliation, living arrangements while in college (off campus)</p> <p><i>Protective factors:</i> Attending faith-based institution, academic achievement, participation in college athletics/sports</p>
Marijuana use	6	<p><i>Risk factors:</i> Greek membership/affiliation, living arrangements while in college (on campus, off campus)</p> <p><i>Protective factors:</i> Academic achievement, participation in college athletics/sports</p>
Drunkenness	4	<p><i>Risk factors:</i> Greek membership/affiliation, participation in college athletics/sports</p> <p><i>Protective factors:</i> Involvement in student organizations</p>
Nonmedical stimulant use	4	<p><i>Risk factors:</i> Average or poor academic performance, Greek membership/affiliation, living arrangements while in college (off campus housing)</p> <p><i>Protective factors:</i> Academic achievement</p>
Nonmedical opiate/opioid use	3	<p><i>Risk factors:</i> Academic stress, average or poor academic performance, Greek membership/affiliation, living arrangements while in college (off campus)</p> <p><i>Protective factors:</i> Academic achievement, participation in college athletics/sports</p>
Heavy alcohol use	2	<p><i>Risk factors:</i> College drinking norms, Greek membership/affiliation</p>
Quantity of marijuana use	1	<p><i>Risk factors:</i> Greek membership/affiliation</p>
Ecstasy use	1	<p><i>Risk factors:</i> Living arrangements while in college (off campus)</p> <p><i>Protective factors:</i> Academic achievement</p>
Nonmedical tranquilizer use	1	<p><i>Risk factors:</i> Living arrangements while in college (off campus)</p> <p><i>Protective factors:</i> Participation in college athletics/sports</p>
Anxiety	1	<p><i>Protective factors:</i> Living arrangements while in college (on campus housing)</p>

OUR FINDINGS: PROTECTIVE FACTORS

Our literature review identified eight factors that protect against substance misuse and/or mental health problems. These include the following:

- Academic achievement
- Attending faith-based institutions
- Involvement in student organizations
- Participation in college athletics/sports
- Participation in campus activities
- Perceived college sanctions for alcohol policy violations
- Protective living arrangements while in college
- Out-of-state student status

Table 2 presents these factors, accompanied by substance misuse and/or mental health problem(s) with which they were associated and the number of studies that found these associations to be significant.

- Among those factors found to be protective, academic achievement and protective living arrangements while in college were identified most frequently (12 studies), followed by participation in college athletics/sports (4 studies) and participation in campus activities (3 studies). Collectively, these eight factors were associated with reduced likelihood of eleven substance misuse or abuse patterns and two mental health problems.
- Seven of the eight factors (all but having out-of-state student status) were associated with multiple outcomes.
- Perhaps most importantly, seven of the eight factors (all but participation in college athletics/sports) were associated with alcohol misuse, three factors were associated with the non-medical use of prescription drugs, and three were associated with suicidal ideation. These findings underscore the value of implementing prevention strategies that target these factors.

Table 2: Protective Factors and Associated Problems Present in the College Environment

Protective Factor^a	Number of Studies^b	Associated Substance Misuse and Mental Health Problems^c
Academic achievement	12	Binge drinking, marijuana use, ecstasy use, illicit drug use, nonmedical use of prescription drugs (NMUPD), nonmedical opiate/opioid use, nonmedical stimulant use, suicidal ideation
Protective living arrangements while in college*	12	Binge drinking, suicidal ideation, alcohol use, quantity of alcohol consumed, anxiety
Participation in college athletics/sports	4	Marijuana use, NMUPD, nonmedical opiate/opioid use, nonmedical tranquilizer use, suicidal ideation
Participation in campus activities	3	Binge drinking, suicidal ideation
Attending faith-based institution	2	Binge drinking, alcohol use, NMUPD, quantity of alcohol consumed
Involvement in student organizations	2	Alcohol use, binge drinking, drunkenness
Perceived college sanctions for alcohol policy violations	2	Binge drinking, quantity of alcohol consumed
Out-of-state student status	1	Quantity of alcohol consumed

^a Recoded generic factor and outcome names, derived by aggregating information from multiple studies.

^b Number of studies where the factor was found to be associated with at least one substance misuse and/or mental health problem.

^c All factors and associated outcomes included in this table were found to be prevalent in both male and female undergraduate students.

*These living arrangements include living: with family, parents, or guardian; with a partner or spouse; on campus (protective for anxiety only); on campus co-ed floor; in a campus residence hall (protective for suicidal ideation only); in campus substance-free housing; in campus single-sex female housing; outside the campus community.

OUR FINDINGS: RISK FACTORS

Our review identified ten factors that increased the likelihood of developing substance misuse and/or mental health problems. These risk factors included:

- Academic stress
- Attending college
- Average or poor academic performance
- College drinking norms
- Greek membership or affiliation
- Participation in sports-related social events
- Intention or participation in study abroad program
- Multiple student leadership roles
- Participation in college athletics or sports
- Risky living arrangements while in college

Table 3 presents these risk factors, accompanied by the substance misuse and/or mental health problems with which they were associated and the number of studies that found these associations to be significant. Collectively, these ten factors were associated with increased likelihood of thirteen substance misuse/abuse problems and one mental health problem.

- Six of these ten—*academic stress, average or poor academic performance, Greek membership/affiliation, certain kinds of living arrangements while in college, participation in college athletics/sports, participating in sport-related social events*—were associated with multiple outcomes.
- All ten factors were associated with alcohol misuse, four with NMUPD and nonmedical opiate/opioid use, and three with illicit drug use.

Again, these findings underscore the value of implementing prevention strategies that target these risk factors specifically, as they may be more likely to reduce priority outcomes.

Table 3: Risk Factors and Associated Problems Present in the College Environment

Risk Factor ^a	Number of Studies ^b	Associated Substance Misuse and Mental Health Problems ^c
Greek Membership/Affiliation	49	Drunkenness, heavy alcohol use, binge drinking, alcohol use, marijuana use, illicit drug use, NMUPD, nonmedical opiate/opioid use, nonmedical stimulant use, quantity of alcohol consumed, quantity of marijuana used
Risky living arrangements while in college*	17	Binge drinking, alcohol use, marijuana use, ecstasy use, illicit drug use, NMUPD, nonmedical opiate/opioid use, nonmedical tranquilizer use, nonmedical stimulant use, quantity of alcohol consumed
Participation in college athletics/sports	12	Drunkenness, binge drinking, illicit drug use, quantity of alcohol consumed
Average or poor academic performance	7	Suicidal ideation, binge drinking, NMUPD, nonmedical opiate/opioid use, nonmedical stimulant use
Academic stress	3	Alcohol use, NMUPD, nonmedical opiate/opioid use
Participating in sport-related social events	2	Binge drinking, quantity of alcohol consumed
Attending college	1	Binge drinking
College drinking norms	1	Heavy alcohol use
Intention/participation in study abroad program	1	Quantity of alcohol consumed
Multiple student leadership roles	1	Quantity of alcohol consumed

^a Recoded generic factor and outcome names, derived by aggregating information from multiple studies.

^b Number of studies where the factor was found to be associated with at least one substance misuse and/or mental health problem.

^c All factors and associated outcomes included in this table were found to be prevalent in both male and female undergraduate students.

* These arrangements include living: away from home; on campus; in a campus residence hall; with a roommate; off campus; in an uncontrolled environment (for example, living in a fraternity house).

OUR FINDINGS: RISK OR PROTECTIVE?

Our review identified two factors—*participation in college athletics* and *having certain types of living arrangements while in college*—that could be classified as both risk and protective (see Tables 4 and 5). Specifically, we found:

- Seven types of living arrangements protected against five substance misuse or mental health-related problems.
- Six types of living arrangements increased the risk of ten substance misuse or mental health-related problems.
- One of these arrangements—living in a campus residence hall—produced conflicting results. This factor *increased* the risk of alcohol use and misuse but *protected* against mental health problems of anxiety and suicidal ideation. This implies that the same type of living arrangement that provides the social support that protects against mental health problems may also foster social norms and situations that support drinking.

Table 4: Living Arrangement Risk and Protective Factors and Associated Problems

Factor	Associated Substance Misuse and Mental Health Problems
PROTECTIVE FACTORS	
Living with family, parents, or guardian	Binge drinking, suicidal ideation
Living with partner/spouse	Binge drinking, suicidal ideation
Living on campus co-ed floor	Alcohol use, quantity of alcohol consumed
Living in campus residence hall	Anxiety, suicidal ideation
Living on campus in substance-free housing	Binge drinking
Living on campus in single-sex female housing	Binge drinking
Living outside of campus community	Binge drinking

Factor	Associated Substance Misuse and Mental Health Problems
RISK FACTORS	
Living away from home	Alcohol use
Living on campus	Binge drinking, quantity of alcohol consumed, illicit drug use, marijuana use
Living in campus residence hall	Alcohol use, binge drinking, quantity of alcohol consumed
Living with roommate	Binge drinking
Living off campus	Alcohol use, binge drinking, quantity of alcohol consumed, ecstasy use, illicit drug use, marijuana use, NMUPD, nonmedical opiate/opioid use, nonmedical stimulant use, and nonmedical tranquilizer use
Living in an uncontrolled environment*	Binge drinking

*includes non-substance-free residence halls, off-campus without parents, and fraternity/sorority housing

Similarly, *participation in different types of college athletics or sports activities* both protected individuals against and placed them at risk for substance misuse/abuse or mental health problems. As shown in Table 5:

- Participation in intercollegiate sports, collegiate/intercollegiate sports, team sports, and school-sponsored sports protected against marijuana use, NMUPD, nonmedical opiate/opioid use, nonmedical tranquilizer use, and suicidal ideation.
- These same factors—with the exclusion of participation in school-sponsored sports and inclusion of varsity athletic team membership—also increased risk for alcohol misuse or abuse.

Overall, playing college or inter-college level sports was a risk factor for alcohol misuse, but protected against NMUPD and suicidal ideation. Some of the reasons for this variation may be due to type of sport involvement (e.g., running versus football) and campus policies for athletes, such as regular drug testing.

Table 5: College Athletics Participation-Related Risk/Protective Factors and Associated Problems

Factor	Associated Substance Misuse and Mental Health Problems
PROTECTIVE FACTORS	
Involvement in intercollegiate sports	Marijuana use
Involvement in collegiate/intercollegiate sports	Suicidal ideation
Involvement in school-sponsored sports	NMUPD, nonmedical opiate/opioid use, nonmedical tranquilizer use
Involvement in team sports	Suicidal ideation
RISK FACTORS	
Involvement in collegiate sports	Binge drinking, drunkenness, quantity of alcohol consumed, illicit drug use
Involvement in intercollegiate sports	Binge drinking
Involvement in team sports	Binge drinking
Varsity athletic team membership	Binge drinking, drunkenness

OUR FINDINGS: SHARED FACTORS

Finally, our search produced six factors that were associated with **both** substance misuse/abuse and mental health problems. These shared factors were:

- Academic achievement
- Average or poor academic performance
- Living with parents, family, or guardians
- Living with partner or spouse
- Participation in college athletics or sports
- Participation in campus activities

Table 6 presents these factors and the corresponding problems with which they are associated. *Participation in college athletics* was identified most frequently (16 studies), followed by *academic*

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achievement (12 studies), and *average or poor academic performance* (7 studies). Five of the six factors were protective. Only one factor, *average or poor academic achievement*, increased risk.

Collectively, these six factors were associated with eight substance misuse and one mental health problem.

- Three of the six factors—*academic achievement*, *participation in college athletics*, and *average or poor academic achievement*—were associated with multiple substance misuse problems.
- All six shared factors were associated with *suicidal ideation*, and five of the six were associated with *binge drinking*.

Given this information, implementing prevention strategies targeting these shared factors may be more likely to reduce suicidal ideation and binge drinking among college students than targeting other factors.

Table 6: Shared Factors and Associated Outcomes Present in the College Environment

Factor ^a	Number of Studies ^b	Associated Substance Misuse and Mental Health Problems ^c
PROTECTIVE FACTORS		
Participation in college athletics	16	Marijuana use, nonmedical use of prescription drugs, nonmedical opiate/opioid use, tranquilizer use, suicidal ideation
Academic achievement	12	Binge drinking, illicit drug use, marijuana use, nonmedical use of prescription drugs, nonmedical opiate/opioid use, stimulant use, ecstasy use, suicidal ideation
Living with parents, family, or guardian	3	Binge drinking, suicidal ideation
Living with partner/spouse	3	Binge drinking, suicidal ideation
Participation in campus activities	3	Binge drinking, suicidal ideation
RISK FACTORS		
Average/poor academic performance	7	Binge drinking, nonmedical use of prescription drugs, nonmedical opiate/opioid use, stimulant use, suicidal ideation

^a Recoded generic factor and outcome names, derived by aggregating information from multiple studies

^b Number of studies where the factor was found to be associated with at least one substance misuse and/or mental health problem.

^c All factors and associated outcomes included in this table were found to be prevalent in both male and female undergraduate students.

IMPLICATIONS FOR PREVENTION PLANNING

Prevention practitioners working to prevent substance misuse among college populations can use the information from this review in the following ways:

- **To identify problems and contributing factors prevalent in their own college environments.** Our review revealed problems and factors identified across many different college environments. With these as a starting point, practitioners can begin the process of determining whether these problems and factors exist in their own settings, using this information to identify data sources needed to conduct their own assessments.⁴
- **To identify factors associated with prevention priorities.** Grantees focusing on a specific problem, such as reducing binge drinking in young adults, can look at the risk, protective, and shared factors identified by our review, assess the prevalence of these factors in their communities, and then select strategies that target one or more these factors.
- **To identify at-risk populations.** Our review found that students who were members of, or affiliated with, fraternities and sororities were at greater risk for multiple substance misuse problems than students who were not affiliated. Knowing this, prevention practitioners may choose to reach out to this population to better understand how Greek membership or affiliation affects substance misuse.
- **To increase the impact of prevention activities.** For example, based on the findings of this review, colleges committed to reducing binge drinking might choose to focus their prevention efforts on strengthening factors such as *academic achievement* or *participation in campus activities*, or provide more *protective living arrangements*, because these factors are associated not only with binge drinking, but also with a number of other outcomes, as well.

Conversely, practitioners already addressing one or more factors identified in this review may instead want to focus on factors associated with multiple outcomes in order to get “more bang for the buck.” For example, our findings on shared factors revealed *academic achievement* was associated with eight outcomes, while *participation in campus activities* was associated with only two. Given these information, prevention strategies focused on *academic achievement* may yield a better return on investment compared to strategies focused on *participation in campus activities*.

- **To enhance collaboration.** Finally, practitioners can share findings from this review with other stakeholders to inform their prevention planning process, and to support design and delivery of coordinated and collaborative prevention approaches. For example, all six shared factors identified in this review were associated with *suicidal ideation* among college undergraduates. This finding underscores the need to engage mental health and/or suicide

⁴For a listing of national data sources with measures specific to college students regarding misuse, mental health problems, and college-related risk/protective factors as identified in this review, see *Substance Misuse and Mental Health in College Settings: National Data Sources*, visit <https://sappet-epi.com/new/systematicproduct.asp>.

prevention experts in prevention planning efforts, and to identify and implement strategies designed to reduce both substance misuse and suicidal ideation among college-going populations.

LIMITATIONS OF OUR REVIEW

When consulting the findings of this review, it is important to keep in mind its limitations. These include the following:

- Our search was limited to peer-reviewed studies published from 2000 to 2014 and to search criteria relevant to the priorities of SAMHSA's prevention grantees. As a result, we may have missed some factors and/or outcomes included in studies that fell outside of these limited criteria.
- The majority of our findings were based on research studies that analyzed cross-sectional survey data. Because these data can only provide a snapshot of association at a specific point in time, it is not possible to determine a causal relationship between a given factor and an outcome.
- Our search term of college environment was broadly defined and may have included some factors not directly associated with the college environment. For example, although student's academic performance (e.g. student grades) may fall under individual risk as opposed to college environment, we included academic performance in our search terms to be inclusive of studies that linked student's academic performance with college norms.
- Our search terms for substance misuse and mental health problems were based on our knowledge of SAMHSA's prevention grantees' focus. For example, the substance misuse search term focused only on substance consumption (e.g. binge drinking, nonmedical use of prescription drugs), and did not include substance-related consequences (e.g., drinking and driving, alcoholic cirrhosis). In addition, our mental health problems search terms included conditions commonly associated with substance misuse (e.g. depression, suicidal ideation) and excluded others (e.g., schizophrenia) that may not be directly associated with substance misuse.
- Factors included in this brief were culled from multiple studies, and thus may not be relevant to your community. Because of their potential to influence both substance use- and mental health-related outcomes, it may be tempting to target shared factors identified in this review. However, doing so will produce little, if any, benefit if these factors have not been shown to contribute to these outcomes in *your* community. Consider validating information provided in this brief with your own community-level data, wherever available, and use this resource as a supplement for your prevention decisions.

SUMMARY

In summary, our systematic review revealed the following:

- College-related factors were predominantly associated with alcohol misuse, and especially with high-risk drinking problems like binge drinking and heavy alcohol consumption. However, some studies found an association with illicit drug use, prescription drugs misuse, and mental health problems as well.
- Protective factors were associated predominantly with alcohol misuse, followed by NMUPD and suicidal ideation. Therefore, implementing prevention strategies that enhance these protective factors may be more likely to reduce alcohol misuse, NMUPD, and suicidal ideation among college students.
- Risk factors were associated predominantly with alcohol misuse, NMUPD (including misuse of opioids), and illicit drugs use. Therefore, implementing prevention strategies targeting these risk factors may be more likely to reduce alcohol misuse, NMUPD, nonmedical opiate/opioid use, and illicit drug use among college students.
- Two factors—certain living arrangements while in college and participation in college athletics—could be classified as both risk and protective. Living in a campus residence hall was a risk factor for substance misuse but a protective factor for mental health problems. Playing college or inter-college level sports was a risk factor for alcohol misuse but protected against nonmedical use of prescription drugs and suicidal ideation.
- Shared factors were associated predominantly with suicidal ideation and binge drinking. Therefore, implementing prevention strategies targeting these shared factors may be more likely to reduce suicidal ideation and binge drinking among college students.

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