



A Review of Alcohol Use Interventions on College Campuses and Sexual Assault Outcomes

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Abstract

Purpose of Review To address whether and to what extent alcohol use interventions on college campuses are associated with reductions in sexual assault-related outcomes.

Recent Findings Seven studies evaluating five interventions were included; all showed positive impacts in at least one study. Positive impacts were seen across various intervention approaches, including web-based and in-person approaches, those including individual and group activities, and using content addressing alcohol only or alcohol and sexual assault. Some studies included only heavy drinkers, while others included general populations of students. A widely used web-based alcohol use intervention was found to be effective in reducing sexual victimization in one study but not another. While all interventions showed positive impacts in at least one of the studies, little is understood about the pathways by which alcohol use interventions lead to reduced sexual assault.

Summary Alcohol use is a risk factor for sexual assault, and considerable research shows high levels of both alcohol use and sexual assault on college campuses. Despite the widespread implementation of alcohol use interventions on college campuses, research on the effectiveness of alcohol use interventions on sexual assault is woefully inadequate to address two such important and complex problems. While there is reason to be optimistic about the potential for alcohol use interventions to reduce sexual assault on college campuses, much more research is needed to provide guidance on the most effective approaches for different types of college populations.

Keywords Sexual assault · Alcohol · Prevention · College · Intervention research

Introduction

Sexual assault on college campuses remains endemic throughout the USA; multiple surveys have established that 20–25% of college women are sexually assaulted during their time of enrollment [1•, 2]. College men also report perpetrating sexual assaults in high numbers, with 10–15% reporting “the use of any tactic to make someone engage in sexual activity when that individual is unwilling or unable to consent” annually [1••].

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Negative outcomes of sexual assault that can have life-long impacts are numerous: psychological consequences (e.g., PTSD, depression, anxiety), physical consequences (e.g., STIs, unwanted pregnancy, genital and non-genital injuries), and behavioral consequences (e.g., drug and alcohol abuse, suicide) [3]. For students in college, these impacts can include an inability to complete their college education, drastically affecting their earnings and career trajectories [4–6]. Title IX, passed in 1972, mandates a prompt response to sexual assault and harassment, as well as other forms of sex discrimination, within federally funded educational institutions; it also requires the implementation of programs geared toward the prevention of sexual assault. The Clery Act of 1990 requires that campus crime statistics, including those of sexual assault, be made publicly available [7]. While the body of evidence on the impact of these policies on sexual assault outcomes is limited, there is evidence that some sexual assault interventions have been successful at reducing sexual assault victimization and perpetration, and at increasing bystander behavior to intervene to

prevent sexual assault [8–10]. It is estimated that one-half of all sexual assaults (in college and other settings) involved alcohol consumption by one or both parties [1••, 2]. In an analysis of sexual assaults reported by the general population on the National Violence Against Women Survey, the odds of completed rape were nearly twice as high, and the odds of injury were nine times higher, for alcohol-using offenders compared to those offenders not using alcohol [11].

Alcohol use and abuse is common on college campuses, with some studies finding that 40% of student populations participate in “heavy episodic drinking,” with a strong relationship between alcohol use and sexual assault [12]. Therefore, studies of college sexual assault prevention have recommended that sexual assault interventions specifically address the role of alcohol in sexual assault prevention [13, 14]. There is some evidence of a direct correlation between colleges’ alcohol policies and their sexual assault rates: in a study of 524 college campuses, Stotzer and MacCartney [15] found that those with weaker alcohol policies had higher reports of sexual assaults. Although some college-based sexual assault programs educate about alcohol as a risk factor for sexual assault, specific alcohol reduction interventions may be needed to actually reduce the incidence of alcohol-related sexual assault.

The purpose of this review is to examine the literature on interventions that address the reduction of alcohol use on college campuses and measure subsequent sexual assault-related outcomes. Two recent reviews have asked similar questions. Lippy and DeGue [16] analyzed available literature on the impact of population-based alcohol policies, such as those regulating pricing and outlet density, on sexual assault, mediators of sexual assault, and other potentially related behavioral outcomes. Tait and Lenton [17] completed a literature review examining the impact of web-based alcohol interventions on sexual and intimate partner violence in both college and non-college settings [17]. While we review two studies that were also reviewed in the Tait and Lenton paper [17], we have expanded our review to include non-web-based interventions and focused our review to only include college settings, and only include sexual assault-related outcomes. Our study serves to answer the following question: “What does this evidence say about whether and to what extent alcohol use interventions on college campuses are associated with reductions in sexual assault?”

Methods

Search Strategy

A review of existing literature was conducted using the following inclusion criteria:

1. A controlled intervention of alcohol use related attitudes and behaviors. Because of the limited number of potential studies, we did not restrict our search to randomized controlled trials.
2. Conducted with English-speaking undergraduate students at colleges and universities in the USA.
3. Collected outcomes on factors related to sexual assault victimization, perpetration, or bystander behaviors.
4. Published in a peer-reviewed journal from January 1, 2005, to September 15, 2019.

Searches were conducted in three major public health databases: Scopus, PubMed, and PsycInfo. The search strategy included indexed terms and keywords that limited our findings to universities and colleges, alcohol drinking, health education, prevention, or intervention, and sexual assault.

We identified 281 articles. Ninety-two duplicates were detected using Covidence software, and 157 non-interventions were removed during title/abstract screening. An additional 15 articles were removed because they did not evaluate an intervention conducted in the USA, and one was excluded because it did not target college students.

A full-text review was conducted for the remaining 16 articles. Upon closer review, only five met our inclusion criteria and were selected for extraction. Three additional articles were identified for abstract review through the reference list of Tait and Lenton’s [17] literature review; two of which met our inclusion criteria. The PRISMA chart depicting the screening and review process can be seen in Fig. 1; a detailed search strategy can be found in the Appendix.

Data Extraction

A total of seven articles were selected for extraction. All articles studied the impact of an alcohol use intervention on sexual assault outcomes, though there was variation in content and delivery of the interventions. A coding sheet was developed by our study team. Each article was coded separately by two members of the team; the coding sheets were compared, a consensus was reached on any differences, and a single coding sheet was produced for each article.

Results

Search Results

The search yielded a total of seven papers that met our criteria. One of the papers [22••] was a secondary analysis of a randomized controlled trial described in another of the included publications [21]. All papers were published between 2010 and 2019. Table 1 describes the interventions, study design and measures, hypotheses, and outcomes. Details on the effect sizes of these results can be found in Table 2.

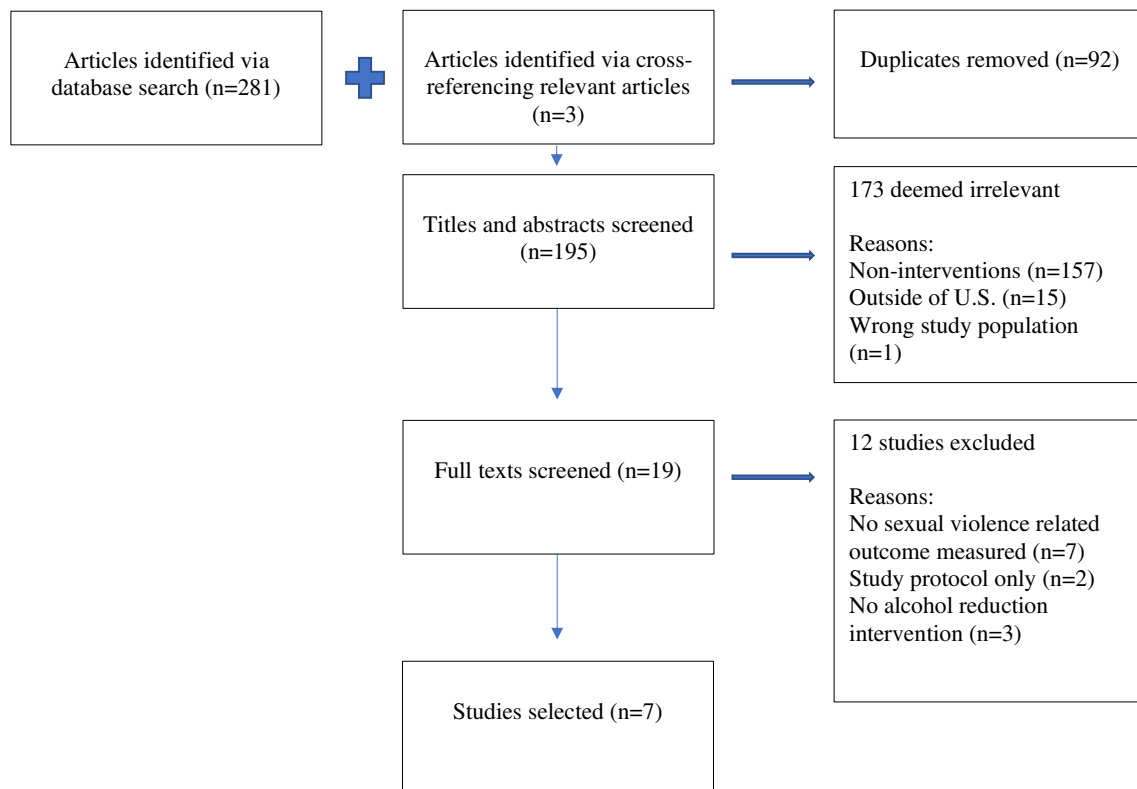


Fig. 1 PRISMA flow diagram

Intervention Characteristics

Interventions for three studies included information on alcohol use only (i.e., there was no sexual assault-related content). AlcoholEDU for College, a commonly used web-based alcohol education tool, was the focus of two papers [19, 20]. In both papers, AlcoholEDU was administered to incoming freshmen. This self-guided web-based intervention leads students through information about blood alcohol content and the dangerous effects of alcohol, as well as about local alcohol-related laws and policies. The remaining modules guide students through goal setting and harm reduction strategies.

In the intervention studied by Clinton-Sherrod et al. [18], all participants completed an online self-report of their own alcohol use and attitudes. The participants were then randomized to one of three intervention groups, or to a control group with no intervention. The three intervention groups received some combination of in-person motivational interviewing and/or personalized feedback; one group received only personalized feedback on their own drinking behaviors, one group received only motivational interviewing regarding alcohol use, and one group received both interventions.

The remaining four studies incorporated sexual assault-related content into at least one intervention group. In the Gilmore et al. papers [21, 22], there were three intervention groups: an alcohol-only intervention with modules similar to those in AlcoholEDU, a web-based sexual assault education

and risk reduction intervention, and a combined intervention. There was an assessment-only control group as well.

The Testa et al. paper [24] focused on a parent-based intervention targeted at incoming female college freshmen. Two intervention groups of mothers received a handbook focused on college drinking and effective mother-daughter communication strategies, with one group receiving an “enhanced” handbook which also included information on sexual partner selection and sex refusal assertiveness. Mothers were encouraged to review and discuss the handbooks with their daughters.

Only one study was targeted specifically at men to reduce sexual assault perpetration by enhancing bystander intervention behaviors [23••]. There was no control group, as this was a pilot study. The intervention consisted of three in-person sessions: a 1:1 session including motivational interviewing and personalized feedback with regard to drinking behaviors, sexual activity, and bystander behaviors; a group session for all participants, focusing on masculinity, empathy, and bystander intervention skill-building; and a group booster session.

Study Design and Measures of Sexual Assault

Four of the six studies discussed in the seven papers were randomized controlled trials (RCTs) [18, 19, 21, 22••, 24]. Paschall et al. [19] employed a multi-site randomized design, in which 15 campuses implemented AlcoholEDU and 15

Table 1 Aims, interventions, and measures for studies of alcohol use interventions on college campuses with sexual assault outcomes, 2010–2019

Authors, year	Type of intervention	Study population and inclusion criteria	Intervention groups and sample sizes	Hypotheses		Other significant sexual assault-related findings
Clinton-Sherrod, M., Morgan-Lopez, A., et al. (2011) [18]	Motivational interviewing (MI)	1st year female college students between ages 18–25, enrolled at south-eastern, midsize university who reported heavy episodic drinking at enrollment	RCT with 3-month follow-up IG1: Motivational interviewing on alcohol use following baseline survey. In person (MI) Baseline sample: 60 Follow-up sample: 49	H1: The interventions would lead to reductions in (a) ambivalence toward changing heavy alcohol use behavior and (b) actual heavy alcohol use	(a) No (b) Mixed	IG3 associated with decreased rates of unwanted sexual activity, compared to CG
			IG2: IG1 plus personalized feedback on alcohol use based on the baseline survey. In person (MIFB) Baseline sample: 54 Follow-up sample: 48 IG3: Personalized feedback on alcohol use from baseline survey without MI. Web-based (FB) Baseline sample: 56 Follow-up sample: 49 CG = Assessment only. Web-based (AO) Baseline sample: 59 Follow-up sample: 53	H2: Reductions in (a) ambivalence toward heavy alcohol use and (b) actual heavy alcohol use will be associated with reduced risk for victimization or revictimization	(a) Yes (b) No	
Paschall, M. J., Antin, T., et al. (2011) [19]	AlcoholEDU for College (web-based alcohol education)	Freshmen students at campuses that had not implemented a school-wide alcohol education program before. Schools from each region (Northeast, South, Midwest, West) were assigned to each condition	RCT with campuses allocated to study arm. Independent cross-sectional random samples of students were collected prior to implementation, 2 months and 8 months after intervention Note: randomization occurred after stratification by college characteristics IG1: Campuses implementing AlcoholEDU. Web-based Completion rate per school ranged between 4 and 100% (SD = 30%) Analysis sample: 1102 CG1: Campuses not implementing AlcoholEDU. Web-based Analysis sample: 1298	H1: AlcoholEDU will be associated with short term reductions in “alcohol-related problems.” Note: alcohol-related problems included a category called “victimization,” which included sexual victimization	Mixed Yes for victimization	IG associated with reduced event rate ratio of sexual victimization at first follow-up compared to CG
				H2: Within the intervention group, stronger effects will be observed at schools with higher course completion rates	Yes	

Table 1 (continued)

Authors, year	Type of intervention	Study population and inclusion criteria	Intervention groups and sample sizes	Hypotheses		Other significant sexual assault-related findings
Wyatt, T.M., Dejong, W., Dixon, E. (2013) [20]	AlcoholEDU for College (web--based alcohol education)	All students at a moderately sized university in the South	Response rate per school ranged between 44 and 48% Time-series analysis All 1st year students were invited to participate in AlcoholEDU starting in 2004 (average completion rate 72%). Alcohol use and related behavior surveys implemented 1992–2009	H1: Each year after implementation, there will be small but notable improvements in alcohol use and “related behaviors” at the university, once a critical mass of students who had completed the intervention was achieved. Note: related behaviors included “being taken advantage of sexually”	Yes, but not for sexual assault outcome	No
Gilmore, A.K., Lewis, M.A., et al. (2015) [21]	Alcohol and sexual assault risk reduction web-based interventions	Women between ages 18–20 who reported having 4 drinks over a 2-h period at least once in the past month; recruited from introductory psychology course at a university	RCT with 3-month follow-up Note: randomization occurred after stratification by sexual assault victimization history IG1 = Alcohol risk reduction intervention only. Web-based Baseline sample: 53 Follow-up sample: 45 IG2 = Sexual assault risk reduction intervention only. Web-based Baseline sample: 52 Follow-up sample: 42 IG3 = Combined alcohol and sexual assault risk reduction intervention. Web-based Baseline sample: 52 Follow-up sample: 38 CG1 = Full baseline assessment only. Web-based Baseline sample: 54 Follow-up sample: 40 CG2 = Minimal baseline assessment only. Web-based Baseline sample: 53 Follow-up sample: 42	H1: (a) There will be greater reductions in <i>alcohol-related sexual assault outcomes</i> following the combined intervention (IG3) versus minimal assessment only (CG1). (b) Strongest effects for women with higher sexual assault severity at baseline H2: (a) There will be greater reductions in <i>sexual assault outcomes</i> for IG2 and IG3 versus CG1; (b) strongest effects for women with higher sexual assault severity at baseline H3: There will be greater reductions in <i>drinking-related outcomes</i> with (a) IG1 and (b) IG3 versus CG1	(a) Yes (b) Yes (a) No (b) Yes (a) Yes (b) No	IG3 associated with reduced frequency of attempted or completed incapacitated rape compared to CG
Gilmore, Bountress and Selmanoff,	Alcohol and sexual assault risk reduction	Women between ages 18–20 who reported having 4 drinks over a 2-h period at least	RCT with 3-month follow-up Note: randomization occurred after	H1: IG3 would be associated with (a) reduced heavy episodic drinking, (b)	(a) No (b) No (c) Yes	IG3 associated with reduced frequency of attempted or completed

Table 1 (continued)

Authors, year	Type of intervention	Study population and inclusion criteria	Intervention groups and sample sizes	Hypotheses		Other significant sexual assault-related findings
George (2018) [22••]	web-based interventions	once in the past month; recruited from introductory psychology course at a university	stratification by sexual assault victimization history IG1 = Alcohol risk reduction intervention only. Web-based Baseline sample: 53 Follow-up sample: 45 IG2 = Sexual assault risk reduction intervention only. Web-based Baseline sample: 52 Follow-up sample: 42 IG3 = Combined alcohol and sexual assault risk reduction intervention. Web-based Baseline sample: 52 Follow-up sample: 38 CG = Full or minimal baseline assessment only. Web-based Baseline sample: 107 Follow-up sample: 82	incapacitation and (c) alcohol-induced blackouts compared with CG H2: IG3 compared to CG would indirectly be associated with reductions in sexual assault victimization through reductions in HED, incapacitation and alcohol-induced blackouts	No	incapacitated rape compared to CG
Orchowski, LM., Barnett, NP., et al. (2018) [23••]	Sexual Assault and Alcohol Feedback and Education (SAFE) program	Heavy-drinking college men, ages 18–22, enrolled at a large northeastern university	Single group pre- and post-test with 2-month follow-up Participants selected at random from university registrar list; invited to complete screening Final sample: 25 Intervention included: (1) One-on-one motivational interviewing with feedback, covering alcohol and sexual assault content, (2) group sexual assault prevention workshop including alcohol content, and (3) group booster session	H1: Post-program, participants would report increases in motivation and confidence to reduce their alcohol use and lower drinking intentions	Yes	Intervention associated with decreased rape myth acceptance and increased bystander intervention intentions from baseline to follow-up
Testa M. (2019)	Parent-based intervention (PBI)	Female college freshmen and their mothers in Erie County, NY	RCT with 3-, 4-, and 8-month follow-up IG1: Baseline assessment, and mothers received handbook on college drinking and effective communication (N = 305 pairs) IG2: same as IG1, plus additional content on sexual assertiveness	H1: PBI (parent-based intervention) would result in increased mother-daughter communication H2: Increased mother-daughter communication would result in lower rates of incapacitated rape (IR) and overall sexual victimization	Yes Yes	IG (combined 1 and 2) associated with lower frequency of reported incapacitated rape compared to CG (combined 1 and 2)

Table 1 (continued)

Authors, year	Type of intervention	Study population and inclusion criteria	Intervention groups and sample sizes	Hypotheses	Other significant sexual assault-related findings
			and partner selection ($N = 218$) CG1: no program, with baseline assessment of mother and daughter ($N = 288$) CG2: No program, with daughter-only baseline assessment ($N = 167$) Group-specific follow-up not specified. Study-wide Baseline: 978 Follow-up 1: 911 Follow-up 2: 904	during the first year of college	

IG intervention group, *CG* control group, *RCT* randomized controlled trial, *H* hypothesis

campuses matched on similar characteristics did not; the campus was the unit of analysis. In the remaining three RCTs [18, 21, 22••, 24], participants were randomized at the individual level, and individuals were the unit of analysis. Orchowski et al. [23••] described a pilot study, which did not include a comparison group, and used a pre-/post-test design. Wyatt et al. [20] used a time-series ARIMA analysis to explore changes in reported alcohol use and alcohol-related behaviors (including being taken advantage of sexually), in the years prior to and during the implementation of the AlcoholEDU on a university campus.

Samples and sample sizes varied across studies. All but two of the studies included only women as participants in the interventions, and three of the women-only studies only included women with a history of heavy episodic drinking [18, 21, 22••]. Only one study included only men, and all men were those with a history of heavy drinking [23••]. Nearly all studies had sample sizes of at least 200 participants. The outliers include one study that had a sample size of 25 [23••], and another with a sample size of 2400 [19].

Every study included pre-/post-test measures of alcohol use behaviors and sexual assault victimization or perpetration; more details on the alcohol measures can be found in Table 2. Both of the interventions centered around AlcoholEDU [19, 20] used “being taken advantage of sexually” as a measure of sexual assault victimization. Clinton-Sherrod’s [18] study of an alcohol-only intervention determined sexual assault victimization with 4 yes/no questions asking about experiences of pressured, attempted, forced, and incapacitated sexual assault. The interventions studied by Gilmore [21, 22••] measured the occurrence of alcohol-related sexual assault and severity of sexual assault using the

Sexual Experiences Survey (SES) [25]. The parent-based intervention studied by Testa et al. [24] measured sexual victimization between follow-up periods using a revised version of the SES updated by the author. The Orchowski study [23••], undertaken with men as participants, included self-reported sexual aggression using the SES Short Form for Perpetration [25], as well as self-reported intent to use bystander intervention strategies to assist friends and strangers in avoiding sexual assault using two behavioral intention scales developed by Banyard et al. [26].

Findings

The fact that not all hypotheses were supported does not necessarily indicate that the intervention was not effective. Rather, it reflects the various types of hypotheses presented, including hypotheses regarding mediating factors, and the impact of interventions on subsets of participants. For example, the hypotheses regarding the impact of mediating factors explored by Clinton-Sherrod et al. [18] were mostly not supported; even so, among women with a history of sexual victimization, the motivational interviewing with personalized feedback intervention was associated with a significant decrease in rates of unwanted sexual activity compared to the control group ($\beta = -.261$; $p < .01$). Reduction in alcohol use ambivalence was a predictor of decreased sexual victimization, but it was not associated with any specific intervention. Gilmore et al. [22••] hypothesized that reductions in sexual assault would be indirectly associated with reductions in heavy drinking, drinking-related incapacitation, and alcohol-induced blackouts, although this hypothesis was not supported.

Table 2 Effect sizes for studies of alcohol use interventions on college campuses with sexual assault outcomes, 2010–2019

	Measure	Effect sizes (CI/SD)	Mediating factors/interaction terms
Clinton-Sherrod, M., Morgan-Lopez, A., et al. 2011 [18]	Rates of alcohol use at follow-up	AO (assessment only): Reference group MIFB: $\beta = -1.604$ (.781)* MI: $\beta = -1.536$ (.781)* FB only: no difference reported	IFB only condition X pre-college victimization: $\beta = 1.394$ (.448)**
	Rates of unwanted sexual activity at follow-up (controlling for ambivalence, alcohol use, and precollege victimization)	AO: Reference group MIFB: $\beta = -.261$ (.072)** MI: no difference reported FB only: no difference reported	Pre-college victimization X MIFB: $\beta = -.144$ (.054)**
Paschall, M. J., Antin, T., et al. (2011) [19]	Event rate ratio for alcohol-related problems (fall semester)	No intervention: Reference group AlcoholEDU intervention: .67 (.51–.87)**	N/A
	Event rate ratio for victimization (fall semester)	No intervention: Reference group AlcoholEDU intervention: .38 (.16–.88)*	N/A
Wyatt, T.M., Dejong, W., Dixon, E. (2013) [20]	Engaged in heavy episodic drinking	Autoregressive parameter estimate: $-.061$ (.012)** Stationary $p = .29$	N/A
	Been taken advantage of sexually	Autoregressive parameter estimate: 1.00 (.983) Stationary R^2 : .002	N/A
Gilmore, A.K., Lewis, M.A., et al. (2015) [21]	Heavy episodic drinking frequency, controlling for baseline heavy episodic drinking frequency	Full AO: Reference group Minimal AO: $\beta = -.122$ (0.962–0.103) Alc intervention: $\beta = 0.138$ (–0.999 to 0.049) SA intervention: $\beta = 0.120$ (–0.964 to 0.108) Combined: $\beta = -0.040$ (–0.693 to 0.399)	Combined condition X alcohol-related sexual assault history: $\beta = 0.183$ (–0.078 to –0.005)*
	Incapacitated attempted or completed rape frequency, controlling for drinks consumed per week	Full AO: Reference group Minimal AO: $\beta = -0.096$ (–0.430–0.119) Alc intervention: $\beta = 0.013$ (–0.249 to 0.290)	Combined condition X alcohol-related sexual assault history: $\beta = -0.206$ (–0.040 to –0.003)*

Table 2 (continued)

Measure	Effect sizes (CI/SD)	Mediating factors/interaction terms
Alcohol-related sexual assault incidence and severity, controlling for baseline drinking behaviors and prior victimization	SA intervention: $\beta = -0.062$ (-0.38-1 to 0.176) Combined: $\beta = -0.172$ (-0.569 to -0.010)*	Combined condition X pre-victimization: $B = -0.196$ (-0.643 to -0.095)**
Use of sexual assault protective behavioral strategies	AO: Reference group Minimal AO: $\beta = .002$ (-4.047 to 4.1460) Alc intervention: $\beta = .093$ (-1.769 to 6.273) SA intervention: $\beta = .041$ (-3.105 to 5.203) Combined: $\beta = -.077$ (-6.141 to 2.202) AO: Reference group Minimal AO: $\beta = -0.060$ (-0.619 to 0.268) Alc intervention: $\beta = -0.090$ (-0.692 to 0.177) SA intervention: $\beta = -0.041$ (-0.569 to 0.323) Combined: $\beta = -0.036$ (-0.557 to 0.341)	N/A
Gilmore, Amanda K., Bountress, Kaitlin E., et al. (2018) [22••]	Difference in frequency of heavy episodic drinking in comparison to assessment-only group, controlling for age, race, sorority affiliation, baseline and follow-up drinking behaviors, and prior victimization history	AO: Reference group Alc intervention: $\beta = -.074$ SA intervention: $\beta = -.070$ Combined intervention: $\beta = .013$
Difference in frequency of incapacitation in comparison to assessment-only group, controlling for all covariates listed above	AO: Reference group Alc intervention: $\beta = .007$ SA Intervention: $\beta = -.145^*$ Combined intervention: $b = -.160$	N/A
Difference in frequency of alcohol-induced blackouts in comparison to assessment-only group, controlling for all covariates listed above	AO: Reference group Alc intervention: $\beta = -.027$ SA intervention: $\beta = -.161^*$ Combined intervention: $b = -.210`$	N/A
Difference in frequency of in comparison to assessment-only group, controlling for all covariates listed above	AO: Reference group Alc intervention: $\beta = .122$ SA intervention: $\beta = .097$	Frequency of incapacitation: $b = .504$ ($p < .001$ ***

Table 2 (continued)

	Measure	Effect sizes (CI/SD)	Mediating factors/interaction terms
Orchowski, LM., Barnett, NP., et al. (2018) [23••]	Alcohol-related consequences	Combined intervention: $b = .026$ Baseline: 10.53 (4.93)** Post-test: 7.73 (5.98)**	N/A
	Heavy drinking days in the past month	Baseline: 7.42 (3.47) Post-test: 6.63 (3.39)	N/A
	Number of drinks per week	Baseline: 17.06 (9.66) Post-test: 15.58 (12.81)	N/A
	Reported sexually aggressive behavior	Baseline: unclear Post-test: 25%	N/A
	Rape myth acceptance	Baseline: 45.80 (14.34)* Post-test: 40.40 (12.92)*	N/A
Testa, M., Hoffman, JH., et al. (2010)	Bystander intervention intentions	Baseline: 188.05 (19.68)* Post-test: 196.55 (19.87)	N/A
Testa M. (2019)	Difference in means between combined control and combined intervention groups for reported heavy episodic drinking	Difference in means: .02 T score: .29	N/A
	Difference in proportions between combined control and combined intervention groups for reported incapacitated rape	χ^2 : 4.26*	N/A

*Denotes p value < .05

**Denotes p value < .01

Please see Table 1 for abbreviations

However, all five interventions reviewed in these seven studies led to a decline in sexual assault outcomes in at least one paper; AlcoholEDU led to a decrease in one paper [19], but not another [20]. Although Paschall et al.'s [19] study of the AlcoholEDU intervention found a significant decrease in the event rate ratio of victimization in colleges that received the intervention as compared to controls ($ERR = .38$; $p < .05$), this significance dissipated by the second follow-up period.

In addition, two studies found that outcomes differed depending on the prior sexual assault or perpetration history of the participants. Women with prior sexual assault histories showed steeper declines in sexual assault victimization relative to women without such histories as a result of motivational interviewing with personalized feedback ($\beta = -.144$; $p < .05$) [18] and combined sexual assault and alcohol risk reduction web-based interventions ($\beta = -0.206$; $p < .05$) [21]. While the intervention in the Orchowski et al. [23••] study led to a reduction in sexual coercion perpetration, 25% of their small sample of men ($N = 5$) did perpetrate some form of sexual aggression during the follow-up period, and all but one of them had reported a history of sexual aggression at baseline.

Conclusion

This study explored the evidence addressing whether and to what extent alcohol use interventions on college campuses are associated with reductions in sexual assault. The first noteworthy finding is that despite the widespread implementation of alcohol use interventions on college campuses, we could only locate seven peer-reviewed papers, discussing five interventions that have explored the relationship between such interventions and reductions in sexual assault. Given that alcohol use has been unequivocally identified as a risk factor for sexual assaults in the general population and among college students [1••, 2], this lack of information to guide college administrators is indeed troubling.

Despite the limited number of available studies, our review suggests that there is reason to be optimistic about the potential for alcohol use interventions to reduce sexual assault on college campuses. As mentioned earlier, five of six interventions reviewed in these seven studies led to a decline in sexual assault outcomes. Tait and Lenton's [17] prior review focused on the impact of web-based interventions, which have been

adopted by higher education institutions across the country, and concluded that there was insufficient evidence, in part due to lack of research and under-powered existing studies, to determine that web-based alcohol-related interventions would lead to a decline in sexual assault outcomes on college campuses. This review ultimately recommended that web-based alcohol interventions be tailored to include specific information on sexual assault prevention. This was done in the Gilmore et al. study [21, 22••], published after the Tait and Lenton review, which found that sexual assault risk reduction interventions were in fact associated with a significant reduction in alcohol-related sexual assault compared to the control group [22••]. Moreover, our review demonstrates the potential and feasibility of alternative interventions that would have fallen outside the scope of the Tait and Lenton review [17], such as the mother-daughter communication intervention [24] and the motivational interviewing intervention [18]. It is noteworthy that Gilmore et al. [22••] found that adding sexual assault content to their alcohol use intervention not only reduced sexual assault outcomes but independently reduced alcohol use as well.

Taken together, we find compelling evidence that alcohol use interventions can be an effective strategy for reducing sexual assault outcomes on college campuses. We are not suggesting that such interventions replace existing sexual assault prevention initiatives, quite the contrary. We are recommending augmenting alcohol use interventions, by ensuring such interventions directly address the link between alcohol and sexual assault. Doing so would likely reduce the number of sexual assaults on campuses and may further reduce alcohol use as well.

Despite these encouraging findings, it is clear that very little is known about the pathways with which these programs are having an impact on sexual assault. Many of the hypotheses about mediators and pathways were not supported. For example, although Clinton Sherrod et al. [18] found that an alcohol use intervention was related to reduced alcohol use and reduced sexual assault outcomes, reductions in alcohol use were not related to reductions in sexual assault outcomes. One intervention that studied the effects of mothers talking to their daughters (after receiving a booklet to guide their discussion) was promising, yet due to the nature of the study, we do not know the content and quality of the discussion between the mother and daughter, in order to understand what components of the intervention were the key to its success [24]. Without further understanding of the essential components of these programs, we will be hampered in our ability to design the most effective program for wider distribution.

It is also noteworthy that some of the studies only included students who were heavy drinkers [18, 21–23], and thus findings related to such interventions cannot be applied to general college populations. For overall sexual assault outcomes (not restricted to alcohol-related sexual assaults), programs seem to

have the most effect on women with histories of prior sexual assault. Four of the studies enrolled only women who reported some heavy drinking, and the single study focused on men similarly enrolled men who were heavy drinkers. The two studies that evaluated AlcoholEDU along with other intervention components targeting entire campuses had mixed results regarding sexual assault outcomes. We also know little about implementation features that effect program success.

There are several important limitations that should be considered when evaluating the results of the studies we reviewed. Although randomization was a strong feature in most of the studies, generally the follow-up periods were quite short (e.g., 2–3 months), and loss to follow-up was a limitation in some. The one study that included an 18-month follow-up showed diminishing effects, underscoring the need to follow participants over time, and suggests the need for including (and evaluating) booster sessions over time. None of the studies examined process measures that would help to understand implementation issues. There was considerable variety in measures that were used, and the field would benefit from some agreement on an overarching conceptual framework and standardized variables used for outcomes, mediators, and moderators.

We would be remiss if we did not address an important consideration in our recommendation to expand the scope of alcohol use intervention goals to include the reduction of sexual assault. We are not advocating an approach to sexual assault prevention in which perpetrators are excused for their behavior due to alcohol use. We are not suggesting that reducing alcohol use will have any effect on the root causes of sexual assault—including toxic masculinity, sexism, and unhealthy relationship norms. We are similarly not suggesting that a victim is at fault for being victimized if he or she has consumed alcohol. The onus of the responsibility for sexual assault is always on the perpetrator, and efforts to eliminate sexual assault need to focus on interrupting perpetrator behaviors. However, given the well-established link between alcohol use and both victimization and perpetration of sexual assault, if we wish to reduce sexual assault, reducing alcohol use is an appropriate and important strategy that appears to hold promise.

As a note on gender and sexuality, our search terms were designed to be inclusive of all interventions within the scope of this question, without making any assumptions as to the gender of the victim or perpetrator. Perhaps unsurprisingly, and certainly reflective of a needed shift in future research, all articles were written with an implicit (or explicit) assumption of the perpetrator being male and the victim being female, and none of the articles we found discussed the experience of LGBT students on college campuses specifically. Finally, more attention should be paid to the relationship between drinking and bystander behavior; in the sexual assault prevention literature, bystander interventions have good evidence for reducing perpetration and victimization [9, 27]. Such an

approach puts the responsibility for preventing sexual assaults on the entire campus and facilitates a social environment where all students, of all genders and sexual orientations, help to protect one another.

Given the large scope of the problem of sexual assault on college campuses, we recognize the urgent need for more research into the effect of alcohol-related interventions on sexual assault outcomes, so that successful programs can be implemented across colleges and universities in the USA.

Compliance With Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Human and Animal Rights This article does not contain any studies with human or animal subjects performed by any of the authors.

Appendix. Devising a Search Strategy

PubMed

The preliminary search terms were:

- Universities[mesh] OR Universit*[tw] OR college*[tw]
- Alcohol Drinking in College[mesh] OR College Drinking[mesh] OR college student drinking[mesh] or university student drinking[mesh] OR alcohol drinking[mesh] OR College Drinking[tw] OR college student drinking[tw] OR university student drinking[tw] OR alcohol drinking[tw]
- Policy[mesh] OR Health Education[mesh] OR Primary Prevention[mesh] OR health educat*[tw] OR program*[tw] OR intervent*[tw] OR prevent*[tw]

When entered in PubMed, this search yielded 2647 results.

Additional terms specific to sexual assault were added to narrow the scope of the search around outcomes related to sexual violence.

- College Drinking[mesh] OR college student drinking[mesh] or university student drinking[mesh] OR alcohol drinking[mesh] OR College Drinking[tw] OR college student drinking[tw] or university student drinking[tw] OR alcohol drinking[tw]
- Policy[mesh] OR Health Education[mesh] OR Primary Prevention[mesh] OR health educat*[tw] OR program*[tw] OR intervent*[tw] or prevent*[tw]
- Sex offense[mesh] OR sexual violence[mesh] OR sexual abuse[mesh] OR sexual assault*[tw] OR rape*[tw] OR sex offense*[tw]
- Universities[mesh] OR Universit*[tw] OR college*[tw]

This search yielded 79 results.

The search terms used for PsycInfo and Scopus were derived from the PubMed search strategy, with database specific modifications.

PsycInfo

DE “Drinking Behavior” OR DE “Alcohol Drinking Patterns” OR “Alcohol Drinking”

DE “Sex Offenses” OR DE “Crime” OR DE “Sexual Abuse” OR DE “Sexual Harassment” OR “Sexual Assault”

DE “Colleges” OR DE “College Environment” OR DE “Higher Education” OR “Universities” OR “Colleges”

Yielded 76; 29 duplicates were removed when imported into Covidence.

Scopus Search

“College Drinking” OR “college student drinking” OR “university student drinking” OR “alcohol drinking” OR “alcohol use”

AND

Policy OR “Health Education” OR Prevention OR intervention

AND

“sexual assault*” OR rape* OR “sex offense*” OR “sexual violence”

AND

university OR universities OR college*

Yielded 126 results, 63 duplicates were identified in Covidence.

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