

Emergency Department Alcohol Intervention: Effects on Dating Violence and Depression

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abstract

OBJECTIVES: With this study, we examined secondary outcomes of an emergency department (ED)-based brief intervention (BI) on dating violence perpetration and victimization and depression symptoms over 3, 6, and 12 months.

METHODS: ED patients (14–20 years) were screened for risk drinking. Patients who received positive screen results were randomly assigned to a computer BI ($n = 277$), therapist BI ($n = 278$), or control condition ($n = 281$). After the 3-month assessment, participants were randomly assigned to receive the post-ED BI or control condition. BIs were used to address alcohol consumption and consequences (eg, dating violence and depression symptoms) by using motivational interviewing.

RESULTS: A total of 836 patients were enrolled in the randomized controlled trial of 4389 patients screened and 1054 who reported risky drinking. Regression models were used to examine longitudinal effects of the alcohol BI on dating violence perpetration, dating violence victimization, and depression symptoms. The therapist BI resulted in a significant reduction of dating violence perpetration up to 12 months (incidence rate ratio [IRR] = 0.53; 95% confidence interval [CI]: 0.37–0.77) and depression symptoms up to 3 months (IRR = 0.85; 95% CI: 0.72–1.00) after the intervention. Computer BI resulted in a reduction of dating violence perpetration (IRR = 0.52; 95% CI: 0.35–0.76) and depression symptoms (IRR = 0.78; 95% CI: 0.66–0.94) 6 months postintervention. Post-ED BIs were associated with lower perpetration at 12 months and lower victimization at 6 and 12 months, irrespective of BI intervention randomization at baseline; however, they did not affect depression symptoms.

CONCLUSIONS: A single-session ED BI revealed previously to show promise in reducing underage drinking also demonstrates promise in preventing dating violence perpetration and depression symptoms. These technology-enhanced BIs could be particularly helpful given the potential for more efficient resource usage and ease of future implementation.



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WHAT'S KNOWN ON THIS SUBJECT: Efficient technology-enhanced interventions used to reduce underage drinking are necessary. A single-session emergency department (ED) brief intervention shows promise for reducing underage drinking. Those seeking ED treatment have a greater likelihood of multiple risk behaviors.

WHAT THIS STUDY ADDS: Other risk factors associated with underage drinking are also mitigated with the abatement of underage drinking. Specifically, an ED intervention on underage drinking was used to reduce dating violence and depression symptoms at 3, 6, and 12 months postintervention.

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Given that 23% of youth between the ages of 12 and 17 years and 38% among emerging adults between the ages of 18 and 25 years report binge drinking,¹ early interventions used to reduce underage drinking are important. Alcohol screening, brief intervention, and referral to treatment (SBIRT) is a promising approach for youth seeking health services.^{2,3} The emergency department (ED) represents a key opportunity to reach young people, who frequently lack a usual source of primary care. Researchers have found that 22% of youth health care visits occur in the ED, with those adolescent ED visits associated with alcohol and drug use, injuries, and other critical health risks.⁴⁻⁶ A recent meta-analysis of SBIRT in the ED revealed significant but modest reductions in alcohol consumption and consequences among adolescents and emerging adults.⁷

Although SBIRT interventions have shown promise, previous alcohol SBIRT interventions in the ED have been limited by a lack of resources and staff.⁸ A technology-assisted ED brief intervention (BI) used to reduce underage drinking could be effective for addressing this particular barrier to care. Our previous research has revealed that single-session alcohol BIs in the ED were efficacious.⁶ Notably, the tested BIs harnessed technology used to facilitate intervention delivery, with 1 condition being a tablet-assisted therapist BI, and another condition was entirely computer-delivered. An intervention with the flexibility to use available clinical staff or be entirely computer-delivered, could significantly increase youth access to alcohol interventions. With this particular intervention, we found effects for both therapist-administered and computer-administered BIs in reducing underage drinking at 3 months and alcohol consequences at 12 months.

This type of BI also has the potential to reduce the impact of other serious health risks associated with underage drinking, including dating violence and depression.⁹⁻¹⁴ Previous analyses from the current study's sample revealed that nearly 1 in 6 of all youth presenting for care, including nearly 1 in 4 who misuse alcohol, reported past-year dating violence.^{15,16} However, the researchers of the previous analyses did not examine alcohol BI effects on dating violence or depression. Given that individuals often exhibit a clustering of problem behaviors,¹⁷ we would theoretically expect that interventions used to target underage drinking could be beneficial in reducing dating violence as well as symptoms of depression. Among substances with abuse potential, alcohol is consistently associated with violence.¹⁸ Studies in which authors use daily calendar data have revealed that dating violence is more likely to happen on days when alcohol is consumed than on days with no alcohol use.^{19,20} Reductions in drinking days could reduce the likelihood of violence perpetration during acute intoxication.²¹⁻²⁴ Additionally, alcohol is strongly and consistently associated with symptoms of depression,¹³ although the nature of this relationship is likely bidirectional. In addition, although some drink as a coping strategy, it has been shown that alcohol is associated with more negative affect.²⁵⁻²⁷ Consequently, reductions in drinking could provide relief from negative affect.^{28,29} In this way, a BI used to reduce underage drinking could have beneficial health effects across several domains of functioning (eg, alcohol misuse, social and/or behavioral functioning, and mental health). Should a BI used to focus on reducing underage drinking also reduce secondary risks while leveraging current technologies (to fit the needs of the context or adapt to staffing demands), such effects would further enhance the significance and potential public health impact of an

intervention that could be used to address risks across health domains.

With this study, we examined 3-, 6-, and 12-month secondary outcomes (dating violence and depression) of an ED BI that has already shown promise in reducing underage drinking. We hypothesize that, relative to the control condition, the computer-administered and therapist-administered BIs will be associated with reductions in (1) dating violence (perpetration and victimization) and (2) symptoms of depression.

METHODS

Design

Baseline through 1 year data for this secondary data analysis study came from a randomized controlled trial (Project U-Connect), which took place at an academic level 1 ED.^{6,30} Eligible underage drinkers who received positive screening on the Alcohol Use Disorders Identification Test–Consumption (AUDIT–C) were randomly assigned via computerized algorithm by using a $3 \times 3 \times 2$ factorial design (3 conditions: computer BI, therapist BI, or control; and 1 of 2 booster conditions: post-ED session after a 3-month follow-up interview or control). The University of Michigan Institutional Review Board approved the study protocols, and we obtained a Certificate of Confidentiality from the National Institutes of Health. The clinical trial is registered at www.clinicaltrials.gov (identifier NCT01051141), which lists secondary outcomes of injury, mental health, and other risk factors. Dating violence and depressive symptoms were chosen for analyses because they are both consistently and robustly associated with alcohol use.

Protocol

Recruitment shifts occurred 7 days a week between 2 PM and 2 AM (from September 2010 to March 2013,

excluding holidays). Research staff reviewed electronic medical records to identify ED patients (14–20 years) for study screening. Patients were deemed ineligible if they were any of the following: (1) not able to consent, (2) under 18 years of age without a guardian present, and (3) not able to self-administer the assessment or BI; for more details, see previous work.⁶ Participants who consented to be screened (or assented with guardian consent if <18 years of age) self-administered a computerized 15- to 20-minute survey and received a \$1.00 gift.

Eligibility

Participants were eligible to participate in the randomized controlled trial if they received a positive screen result on the AUDIT-C^{31,32} (age 14–17 years, score 3+; age 18–20 years, score 4+).^{33,34} After written consent (age 18+ years) or assent and guardian consent (14–17 years), participants self-administered a computerized baseline survey (20–30-minutes; \$20 compensation) and were subsequently randomly assigned to a condition. Participants were stratified by sex, age (14–17 or 18–20 years), and whether they met the criteria for an alcohol use disorder.⁶ Participants then self-administered follow-up assessments at 3, 6, and 12 months via a computer provided by staff or via a Web link (see details elsewhere).⁶ Follow-up assessments at 3, 6, and 12 months were self-administered by participants either on a computer that was provided by staff in-person or via a Web link that was sent to participants. Remuneration for 3- and 6-month follow-ups was \$35 with \$45 for 12-month follow-ups.

Measures

Demographics

Demographic characteristics included questions regarding age, sex, race, ethnicity, and receipt of public assistance.³⁵

Alcohol Consumption

Alcohol consumption was measured by using an AUDIT-C continuous score.^{33,34}

Outcomes

Dating Violence (Conflict in Adolescent Dating Relationships Inventory)

A modified Conflict in Adolescent Dating Relationships Inventory was used to assess past 12-month dating violence victimization and aggression by using 8 items (ie, an included term was “dating partner” meaning girlfriend or boyfriend, fiancée, husband or wife, rather than just boyfriend).³⁶

Depression (Brief Symptom Inventory)

Past-week depression symptoms were measured by using a 7-item Brief Symptom Inventory continuous score.^{37,38}

Conditions

Computer- and Therapist-Delivered BIs

The motivational interviewing-based intervention,^{39,40} which primarily was used to address alcohol use, included delivery via the 2 following modalities: computer and therapist (for details about intervention content, see Walton et al³⁰). The different mechanisms for delivery affected some of the specific content included in the interventions, but both interventions were parallel in structure with similar key components. The computer BI was delivered offline by using touchscreen tablets with a Facebook-styled program (see Cunningham et al for details).³⁰

Clinical decision support was facilitated by a tablet computer during the therapist-delivered BIs.⁴¹ Trained staff coded the therapist BI sessions using the Motivational Interviewing Treatment Integrity 3.0 system (97.3% [$n = 249$])⁴² and found acceptable fidelity (mean global spirit rating: 4.6 [SD: 0.6;

range: 2.7–5.0], exceeding the competency of 4).³⁰

Control

The control condition entailed staff reviewing with participants a resource brochure that included local and online mental health and substance use services and leisure activities. This is considered enhanced usual care and was also given to participants in the intervention conditions.

Post-ED Session

At the post 3-month follow-up, youth were randomly assigned to receive a motivational interviewing-based BI delivered in person, by phone, or video conference by a therapist blinded to ED condition assignment (intervention or no BI; mean = 39.7 minutes for BI). Therapists used touchscreen tablets to address alcohol use, other drug use (as appropriate), and other risky behaviors (eg, injury, driving under the influence) on the basis of responses to the 3-month follow-up.

Data Analysis

Descriptive, bivariate (t tests and χ^2 as appropriate), and multivariate regression analyses (a Poisson regression model was used on the basis of data distribution) were conducted by using SAS version 9.4 (SAS Institute, Inc, Cary, NC). Poisson regression provides the incidence rate ratio (IRR) for each independent variable, with IRR >1 reflecting increased incidence rate and IRR <1 reflecting decreased incidence rate. IRR is used to compare the incidence rate in those with and without an independent variable, and it is not used to measure an absolute rate. Analyses controlled for randomization strata (sex; age group [14–17 years or 18–20 years]).⁶ There were no differences found in baseline characteristics by condition or completion of follow-ups, indicating that data were missing at random. Consequently, analyses

included all available follow-up cases (preferred to imputation when there is random missing data and low attrition; the follow-up rates ranged from 86% to 88%). Regression analyses were used to (1) examine individual, direct effects of the interventions (computer BI and therapist BI, compared with the control) on secondary outcomes (dating violence and depression) at 3, 6, and 12 months; and (2) account for the possible direct effect of the post-ED booster sessions on the secondary outcomes at 6 and 12 months. Dating violence analyses controlled for baseline dating violence and alcohol consumption, and depression analyses controlled for baseline depression and alcohol consumption. Note that for the purposes of these analyses, we control for post-ED booster session randomization after the 3-month follow-up.

Enrollment

In total, 4389 youth were screened with a 13.9% refusal rate and 21.9% missed rate (ie, patients who were eligible but not approached; see Cunningham et al⁶ for additional information regarding recruitment flow). Those who refused the screening questionnaire were more likely to be male patients than female patients (15.1% and 13.0%, respectively; $P < .05$) as were other races when compared with white patients and African American patients (35.0% vs 9.6% and 7.7%, respectively; $P < .001$). Of those patients who were screened, 836 (80.3%) enrolled in the randomized controlled trial. There were no sex differences between participants and refusals before baseline (male patients: 17.0%; female patients: 16.6%), but other races and white patients were more likely to refuse than African American patients (19.5% and 17.7% vs 3.7%, respectively; $P < .01$). Additional data on refusals were not available

without written consent. Attrition analyses were used to indicate that baseline characteristics were not related to condition assignment or drop out.⁶

Participant Characteristics

Participant characteristics did not differ by condition. The sample included 51.6% male patients with a mean age of 18.6 years ($SD = 1.4$ years) with 79.4% identifying as white, 9.5% as African American, and 11.1% as other races. Those reporting Hispanic ethnicity composed 5.5% of the sample. See Cunningham et al⁶ for more comprehensive background characteristics.

RESULTS

Regression results, including IRRs and their associated 95% confidence intervals (CIs) are provided in Table 1.

Dating Violence

Poisson regression models indicated differences in dating violence perpetration between computer BI, therapist BI, and control groups. At 3 months, youth in the therapist BI condition had an incidence rate for dating violence 0.35 times that of youth in the control condition. Youth in the computer BI had an incidence rate of 0.67 compared with youth in the control condition. At 6 months, even after accounting for the effects of the post-ED booster sessions, youth in the computer BI had a 48% lower incidence rate (IRR: 0.52), and therapist BI had a 50% lower incidence rate (IRR: 0.50) than youth in the control condition; the post-ED session was not significant. At 12 months, the incidence of dating violence perpetration in the therapist BI was 47% lower than that of the control condition, adjusting for other variables in the model, including the post-ED booster session (IRR: 0.53). We found no differences between

youth in the computer BI and control conditions at 12 months.

Youth with baseline dating violence (3-, 6-, and 12-month IRR, respectively: 1.36, 1.29, 1.26) and female patients (3-, 6-, and 12-month IRR, respectively: 5.55, 6.18, 5.93) had a higher incidence rate of dating aggression. We found no differences by age.

Dating Victimization

Poisson regression models indicated no differences in dating violence victimization between computer BI, therapist BI, and control groups at 3, 6, or 12 months. Baseline dating violence was associated with an increased incidence rate (3-, 6-, and 12-months IRR, respectively: 1.34, 1.28, and 1.28), and post-ED booster session was associated with a decreased incidence rate (6- and 12-months IRR, respectively: 0.59, 0.65) for dating victimization. The incidence rate for female patients was nearly 2 times greater at 3 months and 3 times greater at 12 months. We found no differences by age.

Depression

Poisson regression models indicated differences in depression symptoms between computer BI, therapist BI, and control groups. At 3 months, computer and therapist BI had a 15% lower incidence rate for depression. At 6 months, computer BI had a 22% lower incidence rate for depression. We found no differences between therapist BI and control groups at 6 months and no differences between either BI condition and control groups at 12 months.

Baseline depression symptoms were associated with an increased incidence rate (3-, 6-, and 12-months IRR, respectively: 1.10, 1.10, and 1.08) for depression symptoms. Female patients, compared with male patients, had an incidence rate 39% greater at 3 months, 33% greater

TABLE 1 Poisson Regression Analyses: Efficacy of TBI and CBI (Versus Control) at 3-, 6-, and 12-Months Follow-Up Controlling for Baseline Characteristics (*N* = 836)

Variable	3 mo (<i>n</i> = 726)	6 mo (<i>n</i> = 717)	12 mo (<i>n</i> = 735)
	IRR (95% CI)	IRR (95% CI)	IRR (95% CI)
Dating aggression			
Baseline alcohol consumption	1.14 (1.07–1.21)***	1.10 (1.02–1.19)*	1.16 (1.08–1.25)***
Baseline DV aggression	1.36 (1.31–1.41)***	1.29 (1.23–1.35)***	1.26 (1.20–1.32)***
Computer BI	0.67 (0.50–0.91)**	0.52 (0.35–0.76)***	0.74 (0.52–1.04)
Therapist BI	0.35 (0.25–0.50)***	0.50 (0.34–0.74)***	0.53 (0.37–0.77)***
Post-ED session	NA	0.82 (0.60–1.13)	0.53 (0.39–0.72)***
Age	0.83 (0.58–1.18)	0.93 (0.61–1.42)	1.00 (0.66–1.50)
Sex	5.55 (3.76–8.18)***	6.18 (3.83–9.98)***	5.93 (3.86–9.07)***
Dating victimization			
Baseline alcohol consumption	1.12 (1.04–1.20)**	0.94 (0.86–1.02)	1.13 (1.04–1.22)**
Baseline DV victimization	1.34 (1.29–1.39)***	1.28 (1.21–1.35)***	1.28 (1.21–1.34)***
Computer BI	0.84 (0.59–1.21)	1.28 (0.84–1.95)	1.42 (0.98–2.07)
Therapist BI	0.98 (0.69–1.39)	1.27 (0.83–1.93)	1.09 (0.73–1.63)
Post-ED session	NA	0.59 (0.41–0.84)**	0.65 (0.47–0.89)**
Age	0.89 (0.58–1.35)	0.77 (0.51–1.16)	1.10 (0.70–1.74)
Sex	1.87 (1.37–2.54)***	1.31 (0.94–1.84)	3.01 (2.13–4.25)***
Depression symptoms			
Baseline alcohol consumption	1.01 (0.97–1.04)	0.97 (0.93–1.01)	1.01 (0.97–1.05)
Baseline depression symptoms	1.10 (1.09–1.11)***	1.10 (1.09–1.11)***	1.08 (1.07–1.10)***
Computer BI	0.85 (0.73–1.00)*	0.78 (0.66–0.94)*	0.90 (0.74–1.08)
Therapist BI	0.85 (0.72–1.00)*	0.86 (0.72–1.03)	1.05 (0.87–1.26)
Post-ED session	NA	1.05 (0.91–1.22)	0.95 (0.82–1.23)
Age	1.02 (0.86–1.21)	1.15 (0.95–1.40)	1.00 (0.82–1.22)
Sex	1.39 (1.22–1.60)***	1.33 (1.15–1.55)***	1.60 (1.37–1.88)***

Sex: female patients versus male patients; age: 18–20 vs 14–17; DV, dating violence.

* *P* < .05

** *P* < .01

*** *P* < .001.

at 6 months, and 60% greater at 12 months.

DISCUSSION

With the study results, we contribute to an already novel and promising intervention. These results reveal that, in addition to reducing underage drinking and alcohol-related consequences,⁶ using the U-Connect intervention also reduces the incidence rate of dating aggression and depression symptoms among adolescents seeking ED care. This is an important context in which to study alcohol-focused interventions because a notable proportion of youth use ED care. The intervention impact was apparent at 3, 6, and 12 months postintervention, even after accounting for post-ED booster session effects after the 3-month assessment. The incidence rate of depressive symptoms in computer

and therapist BI was 15% lower at the 3-month follow-up, whereas the incidence rate of dating aggression was 48% lower in computer BI at the 6-month follow-up and 47% lower in therapist BI at the 12-month follow-up. This reduction in dating aggression compared with the control condition is clinically relevant. Even when controlling for baseline alcohol consumption, we found that these are notable risk reductions, especially given that the intervention was not explicitly focused on dating violence or depression. With our findings, we suggest that participating in an alcohol BI may have a broader impact beyond alcohol consumption, including dating violence and depression secondary outcomes. We expected to find reductions in dating victimization over time; however, findings only occurred after post-ED sessions. This suggests that an individually focused alcohol BI may

require more time-intensive sessions to reduce dating victimization and other complex contextual risk factors. Additionally, baseline dating aggression, dating victimization, and depression severity were each associated with their future outcomes, which highlight their strong influences.

Currently, no ED-based alcohol interventions have been tested that are also used to address multiple detrimental outcomes, including dating violence perpetration and depression symptoms. One ED intervention for adolescents, Real Talk, which is a theoretically informed BI, is used to target dating aggression among youth and has revealed evidence of feasibility and acceptability.⁴³ Although this intervention shows a great deal of promise, the intervention was delivered by a social worker and so may not address the issue of

limited staff resources (eg, time and personnel). Another ED intervention for adolescents, iDove, is focused on symptoms of depression among adolescents seeking treatment in the ED.⁴⁴ This BI included 8-weeks of follow-up text messaging and also had promising results with regard to feasibility and acceptability. Although the follow-up text messages present an efficient way of leveraging technology to extend an intervention, the initial BI still relied on research assistant delivery that would necessitate limited ED staff resources to deliver the intervention. Although both of these interventions show promise, the U-Connect intervention may be able to address all 3 risk behaviors (underage drinking, dating aggression, and depression symptoms) in a BI with an option for computer delivery to maximize technology use and minimize using strained ED resources.

Finally, our team examined the secondary effects of a separate BI used to address alcohol use and peer violence delivered by a therapist with a touchscreen tablet or by a standalone computer session. In terms of primary outcomes, the BIs resulted in a reduction of alcohol-related consequences (in both therapist and computer conditions) and peer aggression (in the therapist condition only).⁴⁵ Secondary analyses revealed that these BIs also resulted in a reduction of dating violence victimization among youth with frequent involvement (in both conditions) but not dating aggression,⁴⁶ likely reflecting the inclusion of content focused on

avoiding dating victimization. In addition, recent secondary analyses reveal these BIs were also used to reduce depression symptoms.⁴⁴ Together, the authors of these studies underscore the association between alcohol with violence and depression, which has been established as a concomitant cluster of factors likely explained by underlying risk and protective factors as well as acute intoxication effects.^{17,21–24} A brief ED intervention for adolescents has the advantage of being able to access a broad array of youth, including those who are attending school and those not in school. Additionally, consistent with recent studies revealing higher rates of dating aggression reported by female patients than by male patients,^{15,16} our findings reveal higher rates of aggression among female patients, suggesting a continued need to account for sex differences during interventions.

Although this intervention shows promise in addressing underage drinking as well as a number of other risk behaviors, there are limitations. The current study findings may not generalize to patient groups outside of a single-site study or to those excluded from the study (eg, nondrinkers). With this study, we also relied on self-report data, but the reliability and validity of such data have been supported when privacy and confidentiality are assured and when self-administered, computerized surveys are employed.⁴⁷ Authors of future studies should examine specific mechanisms by which participation in an alcohol BI reduces related secondary

outcomes. Finally, although the follow-up rates exceeded 85% at the 12-month follow-up, additional replication with larger samples would be key in examining additional outcomes and characteristics of responders versus nonresponders. Despite these concerns, with our findings, we suggest that the U-Connect intervention warrants consideration given the promise shown in reducing multiple risk factors and leveraging technology to address potential challenges in implementation because of a lack of personnel and personnel time.

CONCLUSIONS

A single-session BI (U-Connect) was used to reduce dating violence perpetration and depression symptoms in follow-ups to 1 year. This intervention provides flexibility in the clinical setting, allowing for therapist delivery when staff is available and computer delivery when staff resources are not available.

ABBREVIATIONS

AUDIT-C: Alcohol Use Disorders Identification Test-Consumption
BI: brief intervention
CI: confidence interval
ED: emergency department
IRR: incidence rate ratio
SBIRT: screening, brief intervention, and referral to treatment

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