



Effects of a brief ED-based alcohol and violence intervention on depressive symptoms



Megan L. Ranney^{a,b,*}, Jason Goldstick^{c,d}, Andria Eisman^f, Patrick M. Carter^{c,d,e},
Maureen Walton^{d,g}, Rebecca M. Cunningham^{c,d,e}

^a Department of Emergency Medicine, Alpert Medical School, Brown University, Rhode Island Hospital, 593 Eddy St, Claverick 2, Providence, RI 02903, USA

^b Injury Prevention Center of Rhode Island Hospital, 593 Eddy St., Providence, RI 02903, USA

^c Department of Emergency Medicine, University of Michigan School of Medicine, 1500 East Medical Center Drive, Ann Arbor, MI 48105, USA

^d Injury Research Center, University of Michigan, University of Michigan School of Medicine, 2800 Plymouth Road, NCRC 10-G080, Ann Arbor, MI 48109, USA

^e Michigan Youth Violence Prevention Center, University of Michigan School of Public Health, 1415 Washington Heights, Ann Arbor, MI 48109, USA

^f Department of Health Behavior and Health Education, University of Michigan School of Public Health, 1415 Washington Heights, Ann Arbor, MI 48109, USA

^g Department of Psychiatry, University of Michigan, North Campus Research Complex, 2800 Plymouth Rd. Bldg. 16, Ann Arbor, MI 48109-2800, USA

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ABSTRACT

Objective: Depressive symptoms frequently co-exist in adolescents with alcohol use and peer violence. This paper's purpose was to examine the secondary effects of a brief alcohol-and-violence-focused ED intervention on depressive symptoms.

Method: Adolescents (ages 14–18) presenting to an ED for any reason, reporting past year alcohol use and aggression, were enrolled in a randomized control trial (control, therapist-delivered brief intervention [TBI], or computer-delivered brief intervention [CBI]). Depressive symptoms were measured at baseline, 3, 6, and 12 months using a modified 10-item Center for Epidemiological Studies Depression Scale (CESD-10). Poisson regression was used (adjusting for baseline age, gender, and depressive symptoms) to compare depressive symptoms at follow-up.

Results: Among 659 participants, higher baseline depressive symptoms, female gender, and age ≥ 16 were associated with higher depressive symptoms over time. At 3 months, CBI and TBI groups had significantly lower CESD-10 scores than the control group; at 6 months, intervention and control groups did not differ; at 12 months, only CBI had a significantly lower CESD-10 score than control.

Conclusions: A single-session brief ED-based intervention focused on alcohol use and violence also reduces depressive symptoms among at-risk youth. Findings also point to the potential efficacy of using technology in future depression interventions.

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1. Introduction

Depression is common among adolescents and emerging adults, with significant short- and long-term effects [1,2]. Adolescence is a vulnerable time for both depression and other health risks, including substance use and violence [3,4]. A robust, multi-directional relationship between depression, violence, and substance use has been observed, likely due to similar underlying developmental and contextual considerations [5–7]. Certain maladaptive developmental features of adolescence, such as impulsiveness and deficits in emotional regulation, increase risk of both depression and related health risks [5]. Adolescents

with these characteristics also often lack access to preventive resources and opportunities [3,8–10].

Adolescents seen in the emergency department (ED) are more likely than the average American teen to report past-year physical victimization, depressive symptoms, and alcohol and other drugs use [3,11–13] and are less likely to have a medical home or access to treatment and prevention services [14,15]. Although multi-session therapeutic interventions effectively decrease depressive symptoms and associated risk behaviors (e.g., substance use, violence) among at-risk youth [16], these treatments are generally not accessible or feasible for these youth [9,17]. The ED therefore represents a unique opportunity to reach youth with limited social, material, and institutional resources [18,19].

Adolescent peer violence, alcohol and other drug use, and depression symptoms derive from similar deficits in emotional regulation, problem-solving skills, and self-efficacy [20–22]. Prior literature has

* Corresponding author at: Department of Emergency Medicine, Alpert Medical School, Brown University, Rhode Island Hospital, 593 Eddy St, Claverick 2, Providence, RI 02903.
E-mail address: mranney@lifespan.org (M.L. Ranney).

shown that SaferTeens, a brief intervention delivered to youth endorsing alcohol and violence history, had positive impacts on violence victimization, aggression, and alcohol consequences [23,24]. It is theoretically possible that a single-session, motivational interviewing-based, violence and alcohol focused brief intervention might also affect depression symptoms, given the mutual skill deficits underlying both symptom complexes. Little is known, however, regarding the impact of such brief, single-session interventions on comorbid issues such as depression symptoms. This manuscript examines secondary effects of the SaferTeens intervention on participants' depressive symptoms [23, 24].

2. Methods

Methods for the SaferTeens randomized control trial (RCT) have previously been reported [23,24]. Adolescents (age: 14–18) presenting to a Level 1 ED in Flint, MI for any reason were systematically recruited for the study. Recruitment proceeded seven days a week from 9/2006–9/2009. Exclusion criteria included ED presentation for acute sexual assault or suicidal ideation, or a physical or mental inability to provide assent/consent. After consent (or assent with parental consent if age < 18), research assistants (RAs) screened participants using a brief computerized questionnaire. Adolescents reporting any past-year physical peer aggression (e.g., fighting, measured using a modified version of the Conflict Tactics Scale-2[25]) and past-year alcohol use (defined as drinking alcohol > 2–3 times in the prior year, measured using items from the National Study of Adolescent Health[26]) were eligible for the larger RCT testing the brief intervention. Institutional review board approval was obtained from University of Michigan and Hurley Medical Center, and a National Institutes of Health Certificate of Confidentiality for human subjects was obtained.

Eligible adolescents who completed written consent (or assent and parental consent, if age < 18) then self-administered a computerized baseline survey [see *Measures* below] and were randomized to one of three study conditions: Therapist brief intervention (TBI); Computer-delivered brief intervention (CBI); or, enhanced usual care (EUC). Computerized follow-up assessments were self-administered at 3-, 6-, and 12-months after the ED visit. Participant remuneration was a \$1 gift (e.g., gum) for the screening survey; \$20 for the baseline assessment; and \$25, \$30, and \$35 for the 3-, 6-, and 12-month follow-ups, respectively.

2.1. Measures

Socio-demographic measures (age, race, ethnicity, gender, receipt of public assistance, and education status) and mental health service usage were assessed using items from the National Study of Adolescent Health [27]. For analytic purposes, age was collapsed into the indicator of ≥ 16 ; race and ethnicity were collapsed into African-American and other.

Depressive symptoms were measured using a modified 10-item version of the Center for Epidemiological Studies Depression Scale (CESD-10) [4,28]. The Cronbach's α for the scale within our population was 0.85. The total depression score was the sum of the scores for eight (negative valence) items plus the reverse scores for two (positive valence) items. No other mental health disorders were assessed.

Although violence and alcohol use were measured in the study, these measures were not included in this analysis as they did not differ between groups at baseline and have been extensively described elsewhere.

2.2. Study conditions

2.2.1. Brief intervention content

The 30–45 min SaferTeens brief intervention (BI) was delivered to participants in the intervention arms using two parallel delivery modalities (therapist [TBI], computer [CBI]) within the ED prior to hospital

discharge or admission. The TBI was delivered by a research social worker therapist, aided by a tablet computer to standardize structure and delivery of intervention content. The CBI was delivered entirely by a computer program, with audio interaction with virtual "friends". Delivery of both TBI and CBI were paused and restarted as necessary to avoid interfering with medical care.

Both BIs were based on motivational interviewing (MI), with a primary focus on alcohol and peer violence [29,30] and were designed to cover parallel content, with delivery mechanisms resulting in some differences. Sections included: goals/values, normative statistics for drinking/fighting, reasons to avoid drinking and fighting, role-play scenarios based on the participant's risk behaviors, and next steps. Thus, although not specifically focused on depression, the intervention addressed potentially related risk factors for alcohol use and aggression (e.g., peer and family influences, motivations for drinking such as stress/coping and enhancement, anger management/conflict resolution, and avoiding community violence). The intervention included a review of resources to address depression, such as in the summary segment, in which the intervention prompted interest in obtaining counseling services, and provided community resource lists.

Family members and visitors were asked to leave the treatment room prior to delivery of the BI, to maintain participant privacy and confidentiality.

2.2.2. Enhanced Usual Care

Participants randomized to the EUC condition received a brochure of available community resources addressing substance use, violence, and mental health issues.

2.3. Statistical analysis

Statistical analyses were conducted using SAS 9.1.3 (SAS Institute, Cary Park, NC). Descriptive statistics (means/SD for continuous variables and proportions/confidence intervals for categorical variables) were calculated. Poisson regression was used, in light of the non-normality of the outcome variable and the multiple outcome measures, to examine depressive symptoms among the CBI, TBI, and EUC conditions. Separate models were fit for each time point. Analyses included all available cases with CESD-10 scores at baseline and the corresponding follow-up data point. Randomization strata (gender and age group) as well as baseline depressive symptoms were controlled for; in accordance with standard recommendations for analysis of RCTs, potential confounders that were equally distributed at baseline, such as race and usage of mental health resources, were not included in the model [31]. The level of overdispersion in the Poisson models was estimated using the ratio of the Pearson χ^2 to the degrees of freedom [32]. As necessary, we adjusted our inference for overdispersion by scaling all χ^2 statistics by the estimated dispersion parameter [32] and scaling the standard errors by its square root. Over-dispersion was observed in all models with an estimated dispersion parameter of 2.38, 2.51, and 2.45, in the 3-, 6-, and 12-month models, respectively.

3. Results

As reported previously [23,24], 726 (87.6% of eligible) adolescents enrolled in the study. Those refusing enrollment were less likely to be African-American ($p = 0.004$) and female ($p = 0.02$) compared with those eligible and enrolling. The CESD-10 measure was not administered to the first 67 participants; the total baseline analytic sample was therefore 659.

The analytic sample was 43% male ($n = 285$), 57% African-American ($n = 377$), and 57% reporting receipt of public assistance ($n = 376$). The mean age of participants was 16.8 years (SD = 1.3). Mean baseline CESD-10 score was 13.2 (SD = 6.6). As described elsewhere, there were no significant differences in demographics, violence exposure,

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