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Randomized Pilot Trial of a Cognitive-Behavioral Alcohol, Self-Harm, and HIV Prevention Program For Teens in Mental Health Treatment

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Abstract

Adolescents with mental health conditions represent a high-risk group for substance use, deliberate self-harm (DSH), and risky sexual behavior. Mental health treatment does not uniformly decrease these risks. Effective prevention efforts are needed to offset the developmental trajectory from mental health problems to these behaviors. This study tested an adjunctive cognitive-behavioral family-based alcohol, DSH, and HIV prevention program (ASH-P) for adolescents in mental healthcare. A two group randomized design was used to compare ASH-P to an assessment only control (AO-C). Participants included 81 adolescents and a parent. Assessments were completed at pre-intervention as well as 1, 6, and 12-months post-enrollment, and included measures of family-based mechanisms and high-risk behaviors. ASH-P relative to AO-C was associated with greater improvements in most family process variables (perceptions of communication and parental disapproval of alcohol use and sexual behavior) as well as less DSH and greater refusal of sex to avoid a sexually transmitted infection. It also had a moderate (but non-significant) effect on odds of binge drinking. No differences were found in suicidal ideation, alcohol use, or sexual intercourse. ASH-P showed initial promise in preventing multiple high-risk behaviors. Further testing of prevention protocols that target multiple high-risk behaviors in clinical samples is warranted.

Keywords

Suicide; Alcohol; Sexual Risk; Family; Prevention; Adolescent; Clinical Trial

The association between adolescent mental health and high-risk behavior, such as suicidal behavior, non-suicidal self-injury, alcohol and drug use, and sexual risk behavior, has been

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well documented. These behaviors often co-occur among youth with mental health conditions, which can lead to particularly negative outcomes (Brown et al., 2010; Donenberg, Emerson, Bryant, Wilson & Weber-Shifrin, 2001; Esposito-Smythers & Spirito, 2004). Although improved mental health augments physical health, it does not always lead to the prevention of these high-risk behaviors (Curry et al., 2012; Linehan, 1997). The purpose of the present study was to test a cognitive-behavioral family-based alcohol, deliberate self-harm (DSH; suicidal and non-suicidal self-injury), and sexual risk prevention program for adolescents in mental healthcare.

Family factors, such as communication and parental monitoring, are highly influential in the development of adolescent mental health problems and high-risk behavior (Brown et al., 2010; DiClemente et al., 2001; Perrino, Gonzalez-Soldevilla, Pantin, & Szapocznik, 2000; Nash, McQueen, & Bray, 2005). Effective parent-child communication can facilitate acquisition of knowledge, adoption of parental norms/values, and reductions in substance use, suicide attempts, and sexual risk behavior (Mark et al., 2013; Nash et al., 2005; Perrino et al., 2000; Reimuller, Hussong, & Ennett, 2011). Moreover, low parental monitoring has been associated with greater adolescent substance use and sexual risk behaviors (DiClemente et al., 2001). Thus, including parents in adolescent prevention work may enhance outcomes.

Not surprisingly, family-based *treatments* for adolescent suicidal behavior and substance use disorders show great promise (for reviews see Glenn, Franklin, & Nock, 2015; Hogue, Henderson, Ozechowski, & Robbins, 2014). Though also critical to prevention efforts, most¹ adolescent-focused suicide, substance abuse, and HIV *prevention* programs, respectively, are universal in nature (i.e., target the general public) and don't involve parents. While important, universal prevention programs often show greatest effects among those at *lowest* risk (Offord et al., 2000). There is a strong need for effective family-based selective (i.e., target specific sub-populations whose risk of condition is higher than average), and indicated (i.e., target individuals who have minimal but detectable signs or symptoms of condition) adolescent preventive interventions in these specific areas (Lightfoot, 2012; Wyman, 2014). Selective and indicated interventions can be very efficient if high-risk youth are accurately identified (Offord, 2000).

Notably, there is some evidence to suggest that family-based selective and/or indicated prevention programs yield stronger effects than those that only include adolescents. For example, in a selective/indicated suicide prevention program, Hooven, Herting, and Snedker (2010) found that integrated parent + adolescent brief interventions, relative to adolescent only and minimal intervention conditions, was associated with the greatest effects on suicidal thoughts among high school students (grades 9–12, $M_{age}=15.95$, $SD=1.08$) with suicide risk factors. In the area of substance abuse prevention, Koning, Lugtig and Vollebergh (2014) found that a parent (parent meeting) + student (class lessons) alcohol prevention program, slowed the growth of drinking among early onset drinkers (grade 7, $M_{age}=12.66$, $SD=0.49$), relative to parent only, student only, and control conditions.

¹Abbreviations: ASH-P = Alcohol, Self-harm, and HIV Prevention program (ASH-P); AO-C Assessment Only Control condition (AO-C); DSH = Deliberate Self-Harm; SCLT = Social Cognitive Learning Theory; CBT = Cognitive Behavioral Therapy

Similarly, Winters, Fahnhorst, Botzet, Lee and Lalone (2012) found that adolescent + parent and adolescent only brief interventions were associated with greater reductions in alcohol and marijuana use relative to a control condition among adolescents identified as abusing alcohol or drugs in the school setting (ages 12–18, $M_{\text{age}} = 16.3$, $SD = 1.04$). Further, the adolescent + parent condition showed greater reductions in marijuana use relative to the other two conditions. Though relatively more selective/indicated sexual risk prevention programs have been tested, few are family-based (Lightfoot, 2012). In the only sexual risk prevention trial for youth in mental healthcare (ages 13–18, $M_{\text{age}} = 14.85$, $SD = 1.59$), Brown et al. (2014) found that parent + adolescent and adolescent only group interventions were associated with fewer unsafe sex acts, greater condom use, and greater avoidance of sex, but not abstinence or number of partners, relative to an adolescent only general health promotion condition.

As is evident, most prevention programs reviewed above suggest added benefit of parental participation. The present study integrates techniques from two cognitive-behavioral protocols (blinded) to pilot a selective/indicated prevention program for multiple high-risk behaviors. Specifically, a randomized, controlled, repeated measures design was used to assess the preliminary efficacy of a cognitive-behavioral, family-based, Alcohol, Self-harm, and HIV Prevention protocol (ASH-P) relative to an assessment-only control condition (AO-C) for adolescents in mental healthcare. We hypothesized that ASH-P would be associated with greater improvements in parent–child communication, perceptions of parental disapproval of sex and alcohol/drug use, and parental monitoring, relative to the AO-C. We also hypothesized that ASH-P, in comparison to AO-C, would be associated with lower odds of engagement in any alcohol use, binge drinking, marijuana use, suicidal ideation, DSH, and sexual intercourse, and greater refusal of sex to avoid a sexually transmitted infection (STI).

1. Method

1.1. Study Sample, recruitment, and screening

This study was approved by the affiliated University Human Subjects Review Board. Participants were 81 adolescents who were: 13–17 years old; receiving mental healthcare (counseling and/or psychiatric medication) in the community at the time of recruitment; living with a parent/guardian willing to participate; and English speaking. Adolescents were ineligible if they were: unable to provide assent or participate in groups due to cognitive limitations; psychotic; homicidal; alcohol/drug dependent; pregnant; or HIV+.² Data were collected from 2010–2014.

Adolescents were recruited via clinical referral from community-based facilities (43% a youth shelter, 27% community mental health centers, 10% private practices, 10% juvenile court, 2% school counselors, 3% unknown) and advertisements (10%). Staff at recruitment sites told families about the study and provided them with a brochure. If interested, parents

²Inclusion criteria initially required adolescents to be sexually active. This was changed early in the trial due to the significant number of adolescents who screened out due to this criterion. All those who screened out for this reason were re-contacted by research assistants for participation.

provided their contact information, which was given to study staff. A research assistant then contacted the family, read from a script that included a study overview and eligibility screener, and set up an appointment for consenting and baseline assessment. Those self-referred contacted study staff.

As shown in Figure 1, 285 families were screened for eligibility and 204 were excluded or declined participation. The most common reasons for declining were that the time commitment was too great, wanted guaranteed placement in ASH-P, and scheduling conflicts. Of the 81 eligible families that provided parental consent and adolescent assent, 40 were randomized to the AO-C and 41 to the ASH-P conditions.

Participants included 47 females and 34 male adolescents, with a mean age of 15.4 years ($SD = 1.42$, $Range = 13-18$) at baseline. The sample was primarily White (42.0%) or Black/African American (37.0%) and non-Hispanic (81.5%). Most participating caregivers were female (90.1%) and biological mothers (74.1%). The yearly household income ranged from less than \$20,000/year (11%) to greater than \$100,000/year (33.3%). Under half of participants had married parents (45.7%).

Demographics, clinical history, and outcome variables at baseline are presented in Tables 1 and 2. All comparisons across ASH-P and AO-C conditions were non-significant. Only two differences were found between those who were and were not retained across follow-ups. At 6-months, those who were (vs. were not) retained reported higher rates of internalizing disorders (63.8% vs. 30.4%, $\chi^2(1) = 7.39$, $p = .007$) and lower rates of sexual intercourse (31.0% vs. 56.5%, $\chi^2(1) = 4.53$, $p = .033$). All randomized participants were considered for analyses.

1.2. Randomization and assessment

Participants were stratified based on gender, race (white/non-white), suicide attempt history, and alcohol or marijuana abuse history. Using a random numbers table generated by an independent biostatistician, the project director randomly assigned participants into ASH-P or AO-C groups. Follow-up assessments were administered at 1, 6, and 12-months post-enrollment. Families were compensated for their time.

1.3. Study conditions

The ASH-P protocol is grounded in social cognitive learning theory (SCLT; Bandura, 1986). According to SCLT, high-risk behavior results in part from prior learning histories, especially the learning of social behaviors and core beliefs. To promote change, individuals must learn adaptive ways of relating to self and others and develop self-efficacy in the use of their new skills. Cognitive Behavioral Therapy (CBT) combines psychoeducation with behavior change and cognitive information processing methods to facilitate skill acquisition. Using CBT techniques, ASH-P targets the common maladaptive behaviors and beliefs that underlie high-risk behaviors via adolescent skill development, parental modeling of skills, and positive parenting.

The ASH-P manualized protocol was developed by modifying theoretically consistent, evidence-based, CBT protocols for adolescents with co-occurring suicidality and substance

use disorders (blinded) and adolescent HIV prevention (blinded). The protocol was delivered in a 12-hour workshop over two consecutive weekends (8 hours and 4 hours, respectively). The workshops included small adolescent and parent groups which merged for joint family exercises (approximately 1/3rd of the workshop). Group size ranged from 2–4 parent-adolescent dyads. There was also a 2-hour individualized booster session held two weeks post-workshop. Two interventionists led each workshop and booster session. Broadly, the workshops included psychoeducation, risk prevention planning, assertive communication training, cognitive behavioral skills training around high-risk areas (problem-solving, communication, affect management, parental monitoring, condom use), engagement techniques, and the provision of community-based resources for families.

Notably, communication around targeted high-risk areas was facilitated by first discussing these topic areas in individual groups and engaging in role-plays. Using reflective listening and assertive communication skills learned earlier in the workshop, participants were then asked to discuss these topics in either parent-adolescent dyads (adolescent sharing of suicide risk prevention plan and parental sharing of values around sex) while facilitators walked around the room and provided individualized feedback or via an observed discussion (parents shared values around alcohol and drug use) where dyads held their discussion in front of the group and received feedback on their communication style from group members and interventionists.

Participants in the AO-C condition were given a psychoeducational packet about adolescent substance abuse, suicide, and HIV/STIs. They were also invited to complete the ASH-P intervention after their last follow-up.

1.4. Training, supervision, and quality assurance

Seven master's level interventionists delivered the ASH-P protocol. The first three authors conducted a two-day training that included psychoeducation and practice of workshop material under supervision. Intervention workshops were audiotaped to assess fidelity to the ASH-P protocol. Supervision was provided after each workshop and booster session. The second author reviewed approximately 70% of the audio-files (95 out of 140 hours) from 7 out of 11 randomly selected workshops, including the beginning of all sessions, all joint components, and a random selection of the rest of each audio file using fidelity forms adapted from prior work (Brown et al., 2014). The fidelity forms listed core components of the workshop (18 for adolescent, 16 for parent, and 4 for joint components) and each component was rated for adherence (absent, partial, full) and competence (likert-type rating of 1 = very well to 5 = not very well) in delivery. Adherence was found to be 100%. Competence of delivery was rated as having been done "well" to "very well" more than 90% of the time.

1.5. Measures

1.5.1. Mental health service use—The Child and Adolescent Services Assessment (CASA) (Burns, Angold, Magruder-Habib, Costello & Patrick, 1997) was used to measure number of hours spent in outpatient mental health treatment in the community.

1.5.2. Psychiatric diagnoses—Adolescent psychiatric diagnoses were assessed with the computer-assisted structured Diagnostic Interview Schedule for Children 4.0, administered to adolescents and parents (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). A diagnosis was assigned if criteria were met via parent or adolescent report.

1.5.3. Communication—A 6-item likert-type subscale from the Parent–Adolescent Sexual Communication Scale (PASCS) (Brown et al., 2014; Dutra, Miller & Forehand, 1999) was used to assess adolescent ($\alpha = .80$) and parent ($\alpha = .78$) perceived openness of sexual communication. Parallel scales were created to assess openness of alcohol/drug (youth scale $\alpha = .86$, parent scale $\alpha = .71$; 6 items) and suicide related (youth scale $\alpha = .64$; parent scale $\alpha = .62$; 10 items) communication.

1.5.4. Parental monitoring—The Parental Monitoring Questionnaire (PMQ) (Kerr & Stattin, 2000) is a 24-item likert-type scale used to assess parent ($\alpha = .91$) and adolescent ($\alpha = .92$) perceptions of parental monitoring.

1.5.5. Parental norms—The Parent Norms on Sexual Activity and Supervision (Baker, Thalberg, & Morrison, 1988) scale was used to assess adolescents' perceptions of their parents' approval of sexual activity (4 likert-type item subscale; $\alpha = .79$). Parallel scales (3 likert-type items) were created to assess perceived parental approval of the alcohol ($\alpha = .87$) and marijuana ($\alpha = .89$) use.

1.5.6. Substance use—Substance use was assessed with items that asked about the number of days adolescents used alcohol, binge drank (5+ drinks in one sitting), and used marijuana, over the last 3 months.

1.5.7. Self-harm—DSH was assessed with the Self-Injurious Thoughts and Behavior Interview 2.0 - Short Form (SITBI 2.0-SF) (Nock, Holmberg, Photos & Michel, 2007). History of suicidal ideation, suicide attempts (including aborted and interrupted), and non-suicidal self-injury over the last year (at baseline) or 6 months (6 and 12 month follow-ups) were examined. Given that rates of suicide attempts were very low, and suicidal and non-suicidal self-injury were significantly correlated over follow-ups ($r = .38-.44$, $p = .001$ to $.004$), these forms of DSH were collapsed into one item as is common in suicide treatment research (Glenn et al., 2015).

1.5.8. HIV risk—HIV risk behavior was assessed with the computer-assisted Adolescent Risk Behavior Assessment (Donenberg et al., 2001) interview. Items that measure refusal of sex to avoid a STI and sexual intercourse in the past 3 months were analyzed.

Main outcomes were examined at baseline, 6 and 12-month follow-ups. Given lack of variability and low levels of reported alcohol use, marijuana use, binge drinking, DSH, and sex in the sample, particularly at follow-ups, these items were dichotomized in main study analyses.

1.6. Statistical analysis

Continuous data were inspected for outliers and Winsorized (set at 2 SD above the mean). T-tests and chi-square analyses, using SPSS (Version 21.0) (IBM Corp., 2012), were conducted to ensure that randomization effectively balanced ASH-P and AO-C conditions on socio-demographic variables, psychiatric diagnoses, and distal outcomes.

A series of structural linear regression models were run to examine proximal mechanistic effects, including whether ASH-P compared to AO-C would result in greater improvement in: 1) parent–child communication around alcohol/drug use, suicidal self-harm, and sex; 2) perceived parental norms about substance use and sex; and 3) parental monitoring, at one and/or six months post-enrollment. Structural logistic regression models were run to examine whether ASH-P compared to AO-C would result in lower odds of alcohol use, binge drinking, marijuana use, suicidal ideation, DSH, refusal of sex to avoid an STI, and any sexual intercourse at 6 and 12 months post-enrollment. Analyses were conducted using MPLUS (Version 6.12) (Muthén & Muthén, 2011). Full Information Maximum Likelihood Estimation (FIML) was used to account for missing data. All analyses covaried the baseline value of the respective dependent variable. Analyses that incorporated 6 and 12-month follow-up data covaried the number of hours spent in outpatient mental healthcare (baseline to 6 or 12 months) to account for any effect of dose of mental health treatment on intervention outcomes.

Exploratory study analyses were conducted to examine the effect of ASH-P relative to A-OC on number of days adolescents used alcohol use, binge drank, used marijuana, and had suicidal ideation, as well as number of DSH acts and sexual acts, among the small subgroup of adolescents who reported any alcohol use ($n = 31$), marijuana use ($n = 35$), suicidal ideation ($n = 35$), DSH ($n = 35$), or sex ($n = 32$), respectively, on any study assessment. Analyses followed the same plan as those for proximal mechanistic effects. To preserve degree of freedom in these small subsamples, we only controlled for the baseline level of the dependent variable, not number of outpatient treatment hours. However, results of independent sample t-tests within each subgroup did not show statistically significant differences in number of outpatient hours across the ASH-P and AO-C groups.

2.0 Results

2.1. Proximal mechanistic outcomes

As can be seen in Table 3, ASH-P relative to AO-C was associated with significantly greater openness and comfort in parent–child communication about alcohol/drug use (medium effects), suicidal behavior (medium-large effects), and sex (small-medium effects), at 1 and 6-month follow-up per parent (not adolescent) report. Adolescents in the ASH-P relative to AO-C condition reported significantly greater increases in perception of parental disapproval of alcohol use at 1 month and sex at 1 and 6-month follow-ups (small effects), but not marijuana use. No significant differences in parental monitoring across groups were reported.

2.2. Distal behavioral outcomes

As can be seen in Table 4, at 6-month follow-up, there were no statistically significant differences on any risk behaviors across conditions. At 12-month follow-up, ASH-P was associated with lower odds of DSH (large effect) and greater odds of refusing sexual intercourse to avoid an STI (large effect) relative to AO-C. Though not statistically significant, ASH-P also had a moderate effect on the odds of binge drinking in the hypothesized direction. No significant differences, or medium-to-large effects, were found across conditions in odds of engaging in any alcohol use, marijuana use, suicidal ideation, or sexual intercourse at 12 months.

As can be seen in Table 5, exploratory analyses showed no statistically significant differences on any risk behaviors across conditions at 6-month follow-up, though ASH-P relative to AO-C had a medium effect on reductions in days used alcohol. At 12-month follow-up, ASH-P was associated with greater reductions in binge drinking days and DSH acts relative to AO-C (large effects). No other differences, or medium-to-large effects, were found.

3. Discussion

To our knowledge, no studies to date have examined integrated selective/indicated prevention programs that target alcohol, DSH, and sexual risk behaviors. Moreover, a prevention program tailored for youth receiving mental healthcare, delivered in a family-based group workshop format, has only been tested by our research group (blinded). ASH-P was associated with significantly greater improvement in parent/guardian report of parent–child communication around alcohol/drug use (medium effect), suicide (medium-large effects), and sex (small-medium effects) as well as adolescent perceptions of parental disapproval of alcohol use and sexual intercourse (small effects) relative to AO-C. ASH-P relative to AO-C was also associated with significantly lower odds of DSH (large effect) and greater odds of refusal of sex to avoid an STI (large effect). Though not statistically significant, ASH-P also had a moderate effect on decreases in the odds of binge drinking relative to AO-C. Results of exploratory analyses suggest that ASH-P relative to AO-C had a moderate effect (not statistically significant) on reductions in days used alcohol at 6-month follow-up, as well as statistically significant reductions (large effects) on days of binge drinking and number of DSH acts at 12-month follow-up, among subgroups of youth who engaged in each respective risk behavior during the course of the study.

The preliminary positive results of ASH-P may stem in part from the use of a family-based prevention approach. ASH-P improved parental comfort and openness in parent–child communication around all three high-risk behaviors, as well as adolescent perceptions of parental disapproval of alcohol and sex, two potential mechanisms of intervention effects. Indeed, greater parental confidence in talking to teens about high-risk behaviors is associated with parents and teens actually engaging in such conversations (Perrino et al., 2000; Lightfoot, 2012). Parent-child communication around high-risk behaviors, such as substances and sex, in turn, reduces the likelihood of these behaviors (Nash et al., 2005; Perrino et al., 2000; Reimuller et al., 2011). Thus, increasing parental comfort and skills

needed to discuss high-risk behaviors is an important component of adolescent prevention work.

The present study also had a number of null findings that deserve discussion. Proximally, lack of change in adolescent perceptions of parental norms around marijuana may have resulted from a ceiling effect, as adolescents across groups reported high parental disapproval at baseline. With regard to communication findings, parents were asked about their *own* comfort and effectiveness in parent-teen discussions around high behaviors, whereas adolescents were asked about their perceptions of their *parents'* comfort and effectiveness. Adolescents may not have been able to perceive parental internal changes. Better instrumentation is needed to capture changes in adolescent perceptions around communication. Lack of differences across groups in parental monitoring may reflect that parental monitoring was well addressed in outpatient mental healthcare and/or adequate time was not dedicated to parental monitoring in ASH-P.

With respect to distal outcomes, lack of differences in engagement in sexual intercourse or alcohol use across groups is not uncommon in prevention research (Brown et al., 2014; Wu et al., 2003) and may reflect that experimentation is normative and increases during adolescence (Frieden, Jaffe, Cono, Richards, & Lademarco, 2014). It is also possible that adolescents may have been in committed relationships during the course of the study or intertwined with deviant peer groups, which may have also impacted these risk behaviors. Future intervention research should examine these possibilities. Lack of change in marijuana use is consistent with national normative data that suggests that few older adolescents perceive great risk in occasional to regular marijuana intoxication (15.8% - 39.6%, respectively)(Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2016). The present study placed more focus on parent versus peer norms. More concentrated marijuana prevention efforts that address parental and peer norms, and a greater focus on parental monitoring, may result in greater impact. ASH-P was also found to be more successful in reducing DSH behavior than suicidal thoughts, consistent with our prior work (blinded). Also notable is that intervention effects for distal outcomes only emerged at 12-month follow-up, potentially reflecting that the low base rate behaviors under study increase over time, consistent with developmental norms, thus increasing the likelihood of finding an effect.

The present study has a number of limitations that deserve mention. It is subject to the limitations of Stage I behavior therapies development research, including a small sample size and limited generalizability (Rounsaville, Carroll & Onken, 2001). The small number of adolescents who engaged in each high-risk behavior under study affects the stability of findings and limited power to detect differences. It also negated our ability to potential explore moderators of intervention effects (e.g., ethnicity, race, parental gender), an important area for future research. Generalizability is also limited by study recruitment and retention rates, which tend to be low for family-focused prevention research (Spoth & Redmond, 2000). The primary reasons provided for study refusal was the length of the intervention and time commitment required. In future research, it will be important to condense these types of programs into one day and explore alternative delivery models (e.g., integration with standard clinical service, technology-based delivery). The sample

composition played a significant role in retention rates. Most youth were recruited upon discharge to home from a youth shelter where they were temporarily placed due to volatile and unstable home environments. Many families moved during the course of the study and were unable to be located. Notably, despite the nature of this sample, retention rates were better than or consistent with those of other community based prevention studies for at-risk youth that include parents (Wu et al., 2003; Spoth et al., 2000). There were also minimal differences in baseline characteristics between those who were and were not retained. Finally, while efforts were made to keep research assistants blind to randomization assignment, they occasionally learned about assignments via spontaneous comments made by participants.

Despite these weaknesses, this study offers many strengths. The use of a family-based workshop to address adolescent alcohol, DSH, and sexual risk prevention is novel, and inclusion of proximal mechanistic as well as distal effects important. Most notably, this protocol was tested with a challenging, very hard to recruit, racially diverse, high-risk clinical sample in significant need of effective preventive intervention, using a randomized, controlled, and longitudinal design. Also notable is the significant and large effect of ASH-P on DSH and refusal of sex to avoid an STI, as well as the medium sized effect on binge drinking, in this small pilot trial, even when conservatively controlling for dose of mental health treatment on outcomes. The reduction in associated physical and emotional costs to adolescents and families cannot be underscored, and highlights the clinical significance of this type of study.

In conclusion, adolescents with mental health conditions represent a high-risk group for substance use, DSH, and sexual risk behavior. Mental health treatment does not uniformly decrease risk for these behaviors, and they are not typically directly addressed unless the adolescent has developed a problem in one of these areas. Thus, effective prevention efforts are needed to decrease the likelihood of developing these potentially lethal high-risk behaviors. Results from the present study provide some preliminary support for an adjunctive cognitive-behavioral, family-based, multi-component alcohol, DSH, and HIV preventive intervention for adolescents in mental healthcare. Family-based prevention protocols, such as ASH-P, that use a common theoretical framework and target cognitive and behavior skill deficits that underlie multiple high-risk areas warrant additional study (Wyman et al., 2014).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Evaluated an alcohol, self-harm and HIV prevention workshop for high-risk teens.
- Workshop was family-based and offered to teens in mental health treatment.
- Workshop was associated with improvement in family communication and norms.
- Workshop had medium-large effects on self-harm, binge drinking, and refusal of sex.

Figure 1.
Participant flow through the study.

Table 1

Socio-demographic and clinical history at baseline by condition.

	Full Sample (<i>n</i> =81)	ASH-P (<i>n</i> = 41)	AO-C (<i>n</i> = 40)
Variable	<i>N</i> (%) / <i>M</i> ± <i>SD</i>	<i>N</i> (%) / <i>M</i> ± <i>SD</i>	<i>N</i> (%) / <i>M</i> ± <i>SD</i>
Gender (male)	34 (42.0)	18 (43.9)	16 (40.0)
Age	15.4 ± 1.4	15.4 ± 1.4	15.4± 1.4
Race (White)	34 (42.0)	18 (45.0)	16 (40.0)
(Black)	30 (37.0)	14 (35.0)	16 (40.0)
(Other)	16 (19.8)	8 (20.0)	8 (20.0)
Ethnicity (Hispanic)	14 (17.3)	7 (17.1)	7 (17.9)
Parents married	20 (55.6)	10 (52.6)	10 (58.8)
Income (in dollars)	68.7K±36.1K	73.2K±64.8K	63.8K±39.8K
Internalizing disorders	44 (54.3)	21(51.2)	23 (57.5)
Externalizing disorders	47 (58.0)	25(61.0)	22 (55.0)
Alcohol abuse disorder	8 (9.9)	5 (12.2)	3 (7.5)
Cannabis abuse disorder	10 (12.3)	7 (17.1)	3 (7.5)

Note. Of the participants who were non-White, 1 was Asian American, 1 American Indian /Alaskan Native, 7 biracial, 7 other, 1 did not indicate race. Internalizing disorders included major depression (28.4%), dysthymia (13.6%), mania (2.5%), hypomania (1.2%), generalized anxiety (9.9%), social phobia (12.3%), and post-traumatic stress disorder (8.6%). Externalizing disorders included attention-deficit/hyperactivity (25.9%), oppositional defiant (45.7%), and conduct (27.2%) disorders.

Table 2

Baseline measure of proximal and distal outcomes by condition.

	Full Sample (<i>n</i> =81)	ASH-P (<i>n</i> = 41)	AO-C (<i>n</i> = 40)
Variable	<i>N</i> (%) / <i>M</i> ± <i>SD</i>	<i>N</i> (%) / <i>M</i> ± <i>SD</i>	<i>N</i> (%) / <i>M</i> ± <i>SD</i>
A-Communication-alc/drug	26.26±9.09	28.27±8.03	24.20±11.25
P-Communication-alc/drug	34.35±5.97	33.68±6.32	35.03±5.59
A-Communication-sex	24.51±9.48	26.46±8.59	22.50±10.03
P-Communication-sex	32.65±7.23	30.88±7.32	34.48±6.75
A-Communication-suicide	46.34±10.29	46.53±10.51	46.15±10.20
P-Communication-suicide	56.79±7.81	56.05±7.56	57.55±8.08
Parental Norms-alcohol	4.15±2.25	4.10±2.25	4.20±2.28
Parental Norms-marijuana	3.58±1.73	3.63±1.74	3.53±1.74
Parental Norms-sex	9.67±4.22	9.85±4.11	9.48±4.37
A-Parental Monitoring	30.62±8.46	30.98±8.03	30.25±8.98
P-Parental Monitoring	35.32±6.89	35.61±6.90	35.03±6.97
Suicidal thoughts	27 (33.3)	14 (34.1)	13 (32.5)
Suicide attempt	13 (16.0)	5 (12.2)	8 (20.0)
Non-suicidal self-injury	20 (24.7)	11(26.8)	9 (22.5)
Deliberate self-harm	25 (30.9)	13 (31.7)	12 (30.0)
Alcohol use	19 (23.5)	12 (29.3)	7 (17.5)
Binge drinking	11 (13.6)	7 (17.1)	4 (10.0)
Cannabis use	21(25.9)	13(31.7)	8(20.0)
Refusal of sex to avoid STI	38 (46.9)	21 (51.2)	17 (42.5)
Sexual Intercourse	31 (38.3)	18 (43.9)	13 (32.5)

Note. All self-harm was assessed over the last 12 months. Alcohol use and sexual behavior were assessed over the last 90 days. A=Adolescent. P=Parent. Alc = alcohol. STI = sexually transmitted infection.

Table 3

Summary of proximal effects of being assigned to the intervention group based on structural regressions.

<u>Outcomes</u>	1 Month					6 Months				
	<u>B</u>	<u>SE</u>	95% CI	β	<i>d</i>	<u>B</u>	<u>SE</u>	95% CI	β	<i>d</i>
<u>Parent Report</u>										
Communication (substance)	2.83**	1.10	0.68, 4.98	0.28	0.59	2.53*	1.22	0.15, 4.91	0.25	0.52
Communication (sex)	2.78*	1.35	0.13, 5.54	0.23	0.48	3.42**	1.26	0.95, 5.89	0.31	0.66
Communication (suicide)	5.73**	1.49	2.80, 8.65	0.38	0.83	4.38**	1.60	1.24, 7.51	0.28	0.59
Parental Monitoring	4.69	3.26	-1.70, 11.07	0.15	0.31	6.28	4.29	-2.14, 14.70	0.18	0.37
<u>Adolescent Report</u>										
Communication (substance)	2.98	2.12	-1.18, 7.13	0.17	0.35	1.54	2.36	-3.09, 6.17	0.08	0.16
Communication (sex)	2.84	1.92	-0.92, 6.60	0.17	0.35	2.19	2.28	-2.27, 6.66	0.12	0.23
Communication (suicide)	-0.27	2.51	-5.18, 4.64	-0.01	-0.02	2.86	2.10	-1.26, 6.98	0.13	0.26
Parental Norms (alcohol)	0.98*	0.49	0.02, 1.94	0.22	0.46	0.27	0.38	-0.47, 1.01	0.08	0.16
Parental Norms (marijuana)	0.52	0.42	-0.30, 1.35	0.15	0.31	-0.11	0.35	-0.79, 0.57	-0.04	-0.08
Parental Norms (sex)	2.08*	0.86	0.40, 3.77	0.23	0.48	1.82*	0.81	0.23, 3.41	0.21	0.43
Parental Monitoring	-3.87	3.81	-11.35, 3.60	-0.10	-0.20	5.04	4.01	-2.82, 12.90	0.12	0.24

* Note. $p < .05$.

** $p < .01$.

One month follow up controls for baseline. Six-month follow up controls for baseline levels as well as outpatient hours. Substance = alcohol and other drugs. Cohen's d (0.2 = small effect, 0.5 = medium effect, 0.8 = large effect).

Table 4

Summary of distal effects of being assigned to the intervention group based on structural logistic regressions.

Outcomes	6 Month					12 Months				
	<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>OR</i>	<i>d</i>	<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>OR</i>	<i>d</i>
Alcohol Use	-0.89	0.85	-2.55, 0.76	0.41	-0.49	-0.46	0.64	-1.72, 0.80	0.63	-0.26
Binge Drinking	0.78	0.81	-0.81, 2.37	2.18	0.43	-1.40	0.86	-3.08, 0.29	0.25	-0.76
Marijuana Use	-0.34	0.63	-1.58, 0.91	0.71	-0.19	0.19	0.77	-1.33, 1.70	1.20	0.10
Suicidal Ideation	0.06	0.71	-1.33, 1.46	1.07	0.04	-0.83	0.67	-2.15, 0.49	0.44	-0.45
Self-Harm	0.87	0.73	-0.55, 2.30	2.39	0.48	-1.84*	0.91	-3.63, -0.06	0.16	-1.01
Refusal of Sex	0.06	0.66	-1.24, 1.35	1.06	0.17	1.58*	0.74	0.13, 3.04	4.87	0.87
Sex	-0.26	0.59	-1.41, 0.89	0.77	-0.14	0.47	0.66	-0.81, 1.76	1.61	0.26

* Note. $p < .05$.

Six-month follow-up analyses controlled for baseline levels and outpatient hours up to that time. Twelve month follow controls for baseline levels and total outpatient hours. Cohen's $d(0.2 = \text{small effect}, 0.5 = \text{medium effect}, 0.8 = \text{large effect})$.

Table 5

Exploratory analyses of distal effects of being assigned to the intervention group based on structural linear regressions.

Outcomes	6 Months					12 Months				
	B	SE	95% CI	β	d	B	SE	95% CI	β	d
Days Used Alcohol	-1.32	0.78	-2.84, 0.22	-0.28	-0.60	-0.29	0.93	-2.11, 1.54	-0.07	-0.15
Days Binge Drank	-0.61	0.68	-1.94, 0.73	-0.20	-0.42	-0.67*	0.32	-1.33, -0.06	-0.43	-0.99
Days Used Marijuana	1.58	4.16	-6.57, 9.74	0.07	0.14	3.62	3.38	-3.00, 10.24	0.18	0.37
Days with Suicidal Ideation	-0.49	4.63	-9.57, 8.58	-0.02	0.42	-0.07	2.51	-4.98, 4.84	-0.01	-0.02
Number of Self-Harm Acts	0.77	0.66	-0.53, 2.07	0.20	0.42	-13.23**	4.31	-21.67, -4.77	-0.67	-1.90
Number of Sex Acts	-2.45	2.68	-7.71, 2.81	-0.16	-0.34	2.34	2.91	-3.35, 8.04	0.16	0.34

** Note. p .01

* p .05.

Six and 12-month follow-up analyses controlled for baseline levels of the dependent variable. Cohen's d (0.2 = small effect, 0.5 = medium effect, 0.8 = large effect). Analyses were limited to the subsample of adolescents who reported engaging in each individual risk behavior, respectively, during at least one of the study assessments.