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Short-term effects of a brief intervention to reduce alcohol use and sexual risk among homeless young adults: Results from a randomized controlled trial

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Abstract

Background—Homeless young adults are more likely than their never-homeless counterparts to abuse alcohol and engage in risky sexual behaviors, yet no interventions to simultaneously reduce both these behaviors among this vulnerable population have been systematically designed and evaluated. We therefore developed a brief intervention (BI) to reduce both alcohol use and sexual risk behaviors among homeless young adults. The results of a randomized trial testing the BI against an education comparison (EC) are presented.

Method—Young adults (N=61; age 17–22 years) from an urban, Northeastern crisis shelter were randomly assigned to either the 2-session, individual-level BI or a time-matched, 2-session, individual-level EC. Generalized linear mixed models for repeated measures determined effects of treatment condition on outcomes.

Results—The BI significantly increased participant readiness to change alcohol use. However, it did not significantly decrease primary alcohol or HIV sexual risk outcomes, independently or relative to EC (all $p > .05$). Participants in the EC reduced times engaged in unprotected sex between baseline and post-intervention to a significantly greater extent ($p < .01$) than those in the BI condition. Participants in both conditions reported satisfaction with respective interventions.

Conclusions—Findings suggest that the BI was acceptable and successful in getting participants to consider changing their drinking. However, lack of change in alcohol and sexual behavior outcomes indicates the need for further research to determine how to translate readiness to change into actual behavioral change among homeless young adults.

Introduction

As many as 2 million Americans aged 18–24 experience homelessness in any given year (Ammerman et al., 2004; National Alliance to End Homelessness, 2012; National Coalition

for the Homeless, 2008). The prevalence of substance use disorders among these homeless young adults is 3 to 4 times higher than that of their never-homeless counterparts (Reardon, Burns, Preist, Sachs-Ericsson, & Lang, 2003; Shelton, Taylor, Bonner, & van den Bree, 2009), with about half of homeless young adults having a history of alcohol use disorders (Koegel, Burnam, & Baumohl, 1996; Thompson & Hasin, 2011). HIV infection rates are also high among homeless young adults, with their rates of infection ranging from 2.3% to 16% (Beech, Myers, Beech, & Kernick, 2003; Greene, Ennett, & Ringwalt, 1997; Logan et al., 2013; Rotheram-Borus & Koopman, 1991; Stricof, Kennedy, Nattell, Weisfuse, & Novick, 1991), as compared to approximately 0.1% of young adults in the general population (Centers for Disease Control and Prevention, 2008; Morris et al., 2014). However, no interventions to reduce both alcohol and sexual risk behaviors among homeless young adults have been systematically designed and evaluated (Logan, et al., 2013; Naranbhai et al., 2011).

Treatment providers and researchers have limited opportunities to intervene with homeless young adults, who are by definition transient, which makes recruitment and retention in longer-term treatment challenging. Thus, brief interventions to reduce alcohol and sexual risk for homeless young adults are needed that are tailored to this population and their environmental context. Drinking and risky sexual activities are often dysfunctional methods for surviving and coping with stressful realities of life on the streets. For example, a homeless young adult might engage in transactional sex to obtain money, food, or shelter and drink alcohol (before and/or after) to cope with feelings arising from such activities. In these situations, survival takes precedence over concerns about the risks associated with these behaviors. Additionally, many homeless young adults have experienced abuse at home and in out-of-home placements (Freundlich, Avery, & Padgett, 2007; Pecora, 2010; Thompson & Hasin, 2012; Thompson & Hasin, 2011), which often leaves them distrusting of authority figures and service systems, another potential barrier to successful intervention. As such, to be accepted by this population, any intervention must be sensitive to the experiences of homeless young adults and the context in which their risk behaviors occur.

Therefore, we developed a brief intervention (BI) tailored to homeless young adults to increase their knowledge of and motivation to change alcohol use and HIV sexual risk behaviors and, subsequently, to decrease the frequencies of these behaviors. The 2-session, individual-level intervention integrated aspects of motivational interviewing (MI), the Transtheoretical Model (TTM), and the Information-Motivation-Behavioral Skills (IMB) model. A randomized 2 (group) $\times$ 2 (time) clinical trial design was employed to compare the BI to a time-matched, 2-session, individual-level education comparison (EC). All sessions were conducted at an inner-city crisis shelter for homeless young adults. Evaluation of data from participant baseline and two week post-intervention assessments provided preliminary information on the effectiveness of, as well as satisfaction with, the BI as compared to the EC. Because of the theoretical basis of the BI, we hypothesized that it would decrease alcohol and HIV sexual risk behaviors to a significantly greater extent than the EC.

Method

Procedures

A sample of eligible homeless young adults were provided a complete oral and written description of the study and invited to participate. Those willing to participate and who provided written informed consent were scheduled to complete a baseline assessment. Using a random number generator, participants were then assigned by the research coordinator to one of two conditions: (1) the 2-session, individual-level brief intervention (BI) [n = 30]; or (2) the 2-session, individual-level education comparison (EC) [n = 31]. Participants were not blind to study conditions. A one-month time interval from baseline to final assessment was selected, because one month is the time clients are encouraged to stay at the shelter. The two sessions were held one and two weeks after baseline assessment. Two weeks after the second session, participants completed post-intervention assessment. The Institutional Review Board at Columbia University approved all procedures.

Participants

Young adults from an urban, Northeastern crisis shelter were eligible for the study if they engaged in unprotected vaginal, anal, or oral sex and heavy drinking (5+ drinks per day for males; 4+ for females; National Institute on Alcohol Abuse and Alcoholism, 2005) in the past month. Of 301 screened, 83 were eligible, 70 completed baseline assessments and were randomized, and 61 participated in all intervention sessions and assessments. Attrition did not differentially occur between groups. Further, no differences were found in baseline sociodemographics or outcomes (all $ps > 0.05$) when the 9 participants who completed baseline assessment but did not return for their first session were compared to the 61 who completed baseline assessment, returned for intervention, and completed the study.

Study Conditions

Brief Intervention—The BI was based on three stylistically consistent and easily integrated theoretical frameworks. The first model, Motivational Interviewing (MI), is a client-centered method for enhancing intrinsic motivation to change by exploring and resolving client ambivalence (Miller & Rollnick, 2002). The model is developmentally appropriate for young adult populations given its consistency with the harm reduction framework (Masterman & Kelly, 2003). Further, brief MI presents few logistical and psychological barriers for at-risk individuals, who may be ambivalent about risk reduction, and should be easily transferable to community and public health programs (Rutledge et al., 2002; Stern et al., 2007). MI strategies reduce alcohol use among adolescents and young adults (McCambridge & Strang, 2004; Carey et al., 2006) and augment the effectiveness of skills-based HIV risk reduction interventions (Harding, Dockrell, Dockrell, & Corrigan, 2001; Belcher et al., 1997).

The second framework was the Transtheoretical Model (TTM), whose basic premise (Prochaska, 1984) is that behavior change is a process involving progression through five stages (Prochaska, DiClemente, & Norcross, 1992): Precontemplation (not ready for change); Contemplation (thinking about change); Preparation (ready to change and intend to take action); Action (initiating change); and Maintenance (continuing change).

The third framework, the **Information-Motivation-Behavioral Skills (IMB) Model** (Fisher & Fisher, 1992) combines the theoretical constructs of the Health Belief Model, Self-Efficacy Model, and the Theory of Reasoned Action as a means to understand and predict AIDS risk and preventive behavior. The IMB model (Fisher, Fisher, Misovich, Kimble, & Malloy, 1996) proposes that information and motivation activate behavioral skills to ultimately enact risk reduction behaviors. In the BI, the IMB scope was expanded to address alcohol use as well as sexual risk behaviors.

Based upon the above theoretical frameworks, the BI was designed to create awareness of the need to change alcohol and HIV risk behavior, produce internal motivation to change, and plan for change. Personalized alcohol use and sexual risk feedback, motivational enhancing techniques, tailored behavioral skills, and a behavior change plan were incorporated. Session 1: Counselors began by eliciting and reflecting participant perceptions and concerns about their alcohol use, sexual risk behaviors, and alcohol use before sexual activity (in the order prioritized by participant). This was followed by a focused discussion on the connection between alcohol and HIV risk, and provision of information on alcohol and HIV sexual risk, as requested. A decisional balance sheet (pros and cons of current alcohol and sexual behaviors) was then completed. Next, to develop discrepancies between individual values and risk behaviors, a values clarification activity (rank importance of provided value cards) was completed, followed by a discussion of how client values aligned with alcohol and sexual behaviors. The final activity was an assessment of readiness to change current risk behaviors, the importance of doing so, and the confidence to make such changes. The session concluded with the counselor reflecting and summarizing the session and providing a brief preview of what would happen in the next session. Session 2: Counselors began with a brief review of the first session and an assessment of current readiness, importance, and confidence to change alcohol use and sexual risk. This was followed by the negotiation and completion of a behavior change plan (set change goals, delineated reasons for change, outlined steps to achieve goals, identified possible barriers and support network, determined how goals would be evaluated). Next, using male condoms, female condoms, and/or dental dams was discussed. The final step was to obtain a commitment from the client to follow the change plan and terminate the session. Sessions lasted 45 to 60 minutes.

Education Comparison—The EC was designed to provide similar information on alcohol and sexual risk without the active theoretical components of the BI. Session 1: This session provided information specific to alcohol. This included normative information on young adult use, reasons people drink, effects of alcohol on liver, pancreas, and central nervous system, warning signs of alcohol dependence, and responses to pressures to drink. Didactic presentations, flip charts, and visual materials were used to illustrate key concepts and clarify misinformation. Session 2: This session provided information specific to sexual behavior and the link between alcohol and sexual risk behavior. This included normative information on young adult sexual behaviors, HIV and other sexually transmitted disease transmission and prevention, and safer sex methods. All sessions lasted 45–60 minutes.

Counselor Training

Brief Intervention—BI counselors included a Caucasian female and a Hispanic male. Both counselors had master degrees in social work and experience providing substance use and sexual risk counseling. Counselors were trained on the research protocol via 20 hours of formal didactic training and 10 hours of supervised practice sessions. Training covered the following: study rationale and approach; detailed description of the intervention (e.g., personal risk feedback forms, session components, handouts, staff manual); matching therapeutic tasks to stage of readiness to change; explaining and obtaining informed consent from participants; confidentiality and protection of data; coding interviews; and managing any distress during and after an interview. Practice sessions were videotaped and two of these sessions were randomly selected and reviewed by the research coordinator for proficiency (adherence and competence) certification. Counselors completed training in the responsible conduct of research with human subjects through the Columbia University Office of Research Compliance and Training.

Education Comparison—The educator for the control condition was an African-American female with a master degree in social work and experience in implementing health promotion and HIV prevention. She received training (5 hours of formal didactic training and 2.5 hours supervised practice sessions) on the research protocol and how to implement the education condition. Practice sessions were videotaped and reviewed by the research coordinator for proficiency (adherence and competence) certification. She also completed training in the responsible conduct of research with human subjects through the Columbia University Office of Research Compliance and Training.

Quality Assurance

Data quality was monitored by random inspection of the completed forms by the research coordinator. In addition, counselors completed a session checklist after each session to ensure that content was consistently presented for each session. Monthly statistics were compiled on participant enrollment, retention from pre-assessment to intervention and through post-assessment, and incentives provided.

Measures

Primary Outcomes—*Alcohol Use*. Alcohol outcomes were measured by items from the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule, DSM-IV Version (AUDADIS; Grant et al., 2003; Grant et al., 1995; Ruan et al., 2008). AUDADIS modules cover detailed information on drinking and associated behaviors. Test-retest reliability of AUDADIS-IV alcohol consumption measures range from good to excellent (ICC=/.69-/.84). Specific alcohol outcomes for this study included the number of times participants drank alcohol, got drunk (consumed enough alcohol to feel impaired or intoxicated), and binge drank alcohol (stayed drunk for two whole days or more) in the past month. *HIV Sexual Risk Behaviors*. Participants reported the number of times they engaged in unprotected sex and the number of sexual partners they had in the past month. *Alcohol Related Sexual Risk*. Participants also reported the number of times they drank alcohol

before having sex and the number of times that being drunk resulted in their not using a condom.

Secondary Outcomes—*Readiness to Change Alcohol Use.* The Readiness to Change Questionnaire (RTCQ) (Heather, Gold, & Rollnick, 1991; Heather & Rollnick, 1993; Rollnick, Heather, Gold, & Hall, 1992) assessed participant readiness to change alcohol use. The questionnaire is comprised of 12 items with responses ranging from [1] strongly disagree to [5] strongly agree. Total scores were recoded as one of three subscales: 0=Precontemplation; 1=Contemplation; or 2=Action. Test-retest reliability and internal consistency of subscales range from good to excellent (Heather et al., 1991). Validation studies have shown satisfactory or better evidence of content, criterion, and construct validity (Heather, Rollnick, & Bell, 1993). For the final sample, internal consistency (α) values of the 4-item subscales for the three stages of readiness to change alcohol use were 0.71 (Precontemplation), 0.72 (Contemplation), and 0.79 (Action). ***Readiness to Change HIV Sexual Risk Behaviors.*** The RTCQ was modified to assess participant readiness to change HIV sexual risk behaviors by replacing drinking terminology with unsafe sexual behaviors (e.g., “My drinking is a problem” became “My unsafe sexual behavior is a problem”). For the final sample, internal consistency (α) values of the 4-item subscales for three stages of readiness to change HIV sexual risk behaviors were 0.58 (Precontemplation), 0.68 (Contemplation), and 0.81 (Action). ***HIV Preventive Knowledge.*** Participants were asked 10 true/false questions on HIV transmission and prevention that were developed by the research team. Responses were coded “0” for incorrect and “1” for correct, with total scores ranging from 0 to 10.

Sociodemographics—Participants were asked to provide the following sociodemographic characteristics: age, race, gender, education, employment status, childhood abuse, history of foster care and juvenile detention/prison, and time spent living on streets prior to shelter.

Participant Feedback—After post-intervention assessment, participants for both conditions completed a 23-item participant satisfaction, acceptability, and perceived effectiveness questionnaire that was developed by the research team. Response categories ranged from strongly disagree (1) to strongly agree (5). Five subscales were created using exploratory factor analyses: (1) *overall satisfaction* [3 items: satisfied with overall quality; would recommend to others; felt valued by counselor; $\alpha=0.70$]; (2) *acceptability of alcohol-specific content* [5 items: alcohol concerns addressed; alcohol prevention needs met; counselor knowledgeable about alcohol; comfortable discussing alcohol use with counselor; honest with counselor about alcohol use; $\alpha=0.80$]; (3) *acceptability of HIV sexual risk-specific content* [5 items: sexual risk concerns addressed; sexual risk prevention needs met; counselor knowledgeable about sexual risk; comfortable discussing sexual risk with counselor; honest with counselor about sexual risk; $\alpha=0.76$]; (4) *perceived effectiveness regarding alcohol use* [5 items: increased awareness of alcohol use; increased readiness to reduce alcohol use; increased motivation to reduce alcohol use; plan to change alcohol behavior; intervention helped reduce alcohol use; $\alpha=0.81$]; and (5) *perceived effectiveness regarding HIV sexual risk behavior* [5 items: increased awareness of sexual risk; increased

readiness to reduce sexual risk; increased motivation to reduce sexual risk; plan to change sexual risk behavior; intervention helped increase safer sex practices; $\alpha=.85$].

Data Analysis

To determine adequate sample size, power estimates were calculated for longitudinal models using four data points (baseline, Session 1, Session 2, and post treatment) for the trend line, a two-group design, a random effects structure with a random slope, residual term, and autocorrelated residuals, and a 15% attrition rate between timepoints. It was determined that to test a between-groups linear trend effect, approximately 30 participants per group would provide 80% power to detect a moderate effect (i.e., a group difference increasing linearly from 0 [first timepoint] to 0.5 SD units [last timepoint]).

Sociodemographic differences between the BI and EC were determined via t-test for continuous variables or chi-square tests for categorical variables. Generalized linear mixed models for repeated measures, at baseline and two-week post-intervention, examined treatment condition effects on outcomes. Each outcome was modeled as a function of condition, time of assessment, and interaction between condition and time of assessment, with age as covariate. Effect sizes were calculated from the adjusted incident rate ratios (AIRR) for the outcomes in the negative binomial distribution and adjusted odd ratios (AOR) for ordinal outcomes. PROC GENMOD in SAS was utilized to conduct this analysis. Differences between conditions for participant satisfaction, acceptability, and perceived effectiveness were analyzed via t-tests. Because all study dropouts occurred before the first session, no procedures were required for missing data.

Results

The final sample ($N=61$) had an average age of 19.3 (± 1.2) [range = 17–22] years. Over half (58.3%) were female; 47.5% were Hispanic, 36.1% African American, and 16.4% other race/ethnicity. No significant differences in baseline sociodemographics were found between those assigned to the two treatment conditions (Table 1). However, due to a trend for a difference in mean age ($t=2.05$, $p=.05$), with BI participants being slightly younger ($\bar{x}=18.97$ years) than those in the EC ($\bar{x}=19.58$ years), analyses controlled for age. Participants also did not differ between conditions at baseline on primary or secondary outcomes ($ps > .05$), including: past month alcohol use; HIV sexual risk behaviors; alcohol-related sexual risk behaviors; readiness to change alcohol use; readiness to change HIV sexual risk behaviors; and HIV preventive knowledge.

Intervention Effects

Primary Outcomes—Alcohol Use. Participants did not significantly reduce their mean times drank, times drunk, or times binged alcohol between baseline and post-intervention, within or between conditions ($ps > .05$; Table 2). **HIV Sexual Risk Behaviors.** A significant reduction in times engaged in unprotected sex was not found for participants in the BI ($p > .05$). However, a significant reduction in times engaged in unprotected sex was found for participants in the EC ($p<0.01$), which was significantly greater than among those in the BI ($p<0.05$). Within-group effects in the desired direction were medium (AIRR=0.39;

95%CI=0.21–0.71; Table 3), as were between group effects (AIRR=2.64; 95%CI=1.06–6.59). No significant reductions in participant number of sexual partners were found within or between conditions ($p \geq 0.05$). *Alcohol Related Sexual Risk*. No significant reductions in times drank before sex or times being drunk resulted in no condom use were found among participants within or between conditions ($p \geq 0.05$).

Secondary Outcomes—Readiness to Change Alcohol Use. The EC did not significantly increase participant readiness to change alcohol use ($p \geq 0.05$). The BI ($p < 0.01$) significantly increased participant readiness to change alcohol use, though this increase did not significantly differ from the EC ($p \geq 0.05$). Effect sizes in desired directions were medium (AOR=3.04; 95%CI=1.31–7.05). *Readiness to Change HIV Sexual Risk Behaviors.* A significant reduction in readiness to change sexual risk behaviors was not found for participants in the BI ($p \geq 0.05$). A significant increase in readiness to change HIV sexual risk behaviors was found for participants in the EC ($p < 0.05$), yet this increase was not significantly greater than the increase in readiness among those in the BI ($p \geq 0.05$). Within-group effects in the desired direction were medium (AOR=2.45; 95%CI=1.00–5.99). *HIV Preventive Knowledge.* The BI did not significantly increase participant HIV preventive knowledge ($p \geq 0.05$). Trends toward increased HIV preventive knowledge scores were found for participants in the EC ($p = 0.05$), though this trend did not significantly differ from the BI ($p \geq 0.05$). Within group effects in the desired direction were minimal (AOR=1.06; 95%CI=1.00–1.13).

Participant Feedback—Both conditions were highly and equally rated in terms of participant satisfaction, acceptability, and perceived effectiveness (Table 4). Participants were satisfied with the overall quality of respective condition, felt their alcohol/sexual risk concerns were addressed and prevention needs met. They found counselors knowledgeable about alcohol/sexual risk and said they were comfortable and honest with the counselors. Further, participants believed their respective interventions increased their awareness, readiness, motivation, and plans to reduce alcohol use/sexual risk.

Discussion

This study evaluated the short-term effectiveness of a BI designed to reduce alcohol use and HIV sexual risk behaviors among homeless young adults. The study employed a rigorous research design, utilized carefully trained and supervised interventionists, and calculated effect sizes. Randomization resulted in two groups that did not differ significantly on baseline variables that were key potential confounders. Further, participants in both conditions found their respective interventions to be highly satisfactory, acceptable, and effective, evidently valuing the individualized, focused attention and safe space to learn and ask questions.

Contrary to expectations, the BI did not significantly decrease primary alcohol or HIV sexual risk outcomes, independently or relative to the EC. However, it did increase participant readiness to change alcohol behavior. A significant reduction in times engaged in unprotected sex was found for participants in the EC, which was significantly greater than the reduction among those in the BI. The EC also produced a significant increase in

readiness to change HIV sexual risk behavior. However, this increase was not significantly greater than the increase among those in the BI. Further, the EC proved ineffective in changing any participant alcohol outcomes.

Methodological issues should be considered when interpreting study results. First, retention was excellent and particularly impressive given the transient nature of the sampled population. However, this also means that those for whom the intervention was not effective remained in the study. Thus, study findings contrast with many clinical trials that appear to show better experimental treatment efficacy but have higher attrition.

Second, administering the post-intervention assessment only two weeks after intervention may not have allowed the effects of the BI to be fully evaluated. Thus, it is possible that behavioral changes might have emerged as underlying motivations and emotions regarding behavioral risks were further processed, integrated, and applied towards behavioral change. For example, the increases shown by BI participants in readiness to change drinking are promising and might represent potential processes that mediate effects of later change in drinking, particularly among heavy drinkers (Tanner-Smith & Lindsey, 2014; Skewes, Dermen, & Blume, 2011; Collins, Logan, & Neighbors, 2010; Kaysen, et al., 2009; Matwin & Chang, 2011). However, studies that have examined the influence of readiness to change (as measured by the RTCQ) on future drinking behaviors among young adults have yielded mixed findings (Bosari, Murphy, & Carey, 2009; Collins, Logan, & Neighbors, 2010). This could be due to the fact that most longitudinal studies to date on readiness to change and change in drinking have measured drinking at only two time-points. Further, the large majority of studies on readiness to change as a mechanism of change in future drinking have been conducted among college students. It is unknown whether readiness to change will translate into actual behavior change among homeless young adults. Longitudinal analyses involving multiple time-points among a broader array of young adults, including those homeless, should examine RTC effects to understand more clearly its relative role in predicting drinking behaviors.

A third methodological issue is that the delivery method and amount of time of the EC sessions were designed to parallel those of the BI sessions. EC sessions were delivered in-person, at the individual-level, and for the same amount of time as those in the BI. This attempt for methodological rigor inadvertently resulted in a comparison condition that contained similar therapeutic elements as the BI that were more highly active than anticipated, making it difficult to determine significant BI effects, especially in such a small sample. Future testing of the BI (or a revised version thereof) should incorporate the use of a no-treatment comparison condition, since this is likely to be the actual comparison condition for the BI in further studies.

Fourth, EC participants were given information specific to sexual behavior and the link between alcohol and sexual risk behavior. This included normative information on young adult sexual behaviors, HIV transmission and prevention, and safer sex methods. Conversely, while all participants in the BI were given education materials identical to those used in EC sessions, such information was reviewed in the BI sessions only when directly requested by the participant or if the participant stated related misinformation during the

sessions. Thus, additional educational information provided to the EC group may help explain the beneficial effects of the EC on sexual risk outcomes.

Fifth, all BI participants completed alcohol and sexual risk behavior change plans at the end of the second session. This could have proved problematic, as a drop in commitment to change behavior has been observed when clients who are not sufficiently ready and able to change are asked to generate and evaluate a change plan (Amrhein et al., 2003). Thus, some participants might not have been at a level of commitment to recover from this drop, which would negatively influence their ability and motivation to engage in behavior change.

Therefore, despite null study findings, future researchers could further develop and test this brief and highly acceptable intervention to improve its efficacy in reducing alcohol use and sexual risk behaviors. For example, content and visual materials from the EC could be provided to all participants, even when not directly requested, to enhance the efficacy of the BI in reducing alcohol use and unprotected sex. Also, individuals at different points on the continuum of motivational readiness to change likely benefit from intervention strategies matched to their current stage. Thus, participants in the BI could be asked to develop a change plan only when they have articulated commitment to change.

Assessments of commitment strength and its underlying dimensions are also needed. Once better measured, specific therapeutic strategies can be developed and evaluated. Additionally, counselors should be trained to better explore and clarify participant ambivalence about changing behavior and evoke and reinforce change and commitment talk throughout the sessions (Rollnick, 1998), as behavior change is associated with a relatively steady increase in the strength (not frequency) of commitment language.

This study evaluated the preliminary effectiveness and feasibility of a brief intervention to reduce alcohol use and HIV sexual risk behaviors among homeless young adults. Although findings suggest that the developed intervention was acceptable, lack of change in alcohol and sexual behavior outcomes indicates need for additional intervention development and testing. However, change in participant readiness to change drinking is promising, and may indicate that the intervention was successful in getting participants to consider changing their drinking. Additional research should determine how to translate readiness to change into actual behavioral change among homeless young adults. This nascent area of study would benefit from further research in order to effectively and feasibly reduce alcohol use and HIV sexual risk behaviors among this vulnerable population.

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References

- Ammerman, SD., Ensign, J., Kirzner, R., Meininger, ET., Tornabene, M., Warf, CW., ... Post, P. Homeless Young Adults Ages 18–24: Examining Service Delivery Adaptations. Nashville: National Health Care for the Homeless Council, Inc; 2004. Retrieved from:<http://www.nhchc.org/wp-content/uploads/2011/09/101905YoungHomelessAdults.pdf>

- Amrhein PC, Miller WM, Yahne CE, Palmer M, Fulcher L. Client commitment language during motivational interviewing predicts drug use outcomes. *J Consult Clin Psychol*. 2003; 71(5):862–878. [PubMed: 14516235]
- Beech BM, Myers L, Beech DJ, Kernick NS. Human immunodeficiency syndrome and hepatitis B and C infections among homeless adolescents. *Semin Pediatr Infect Dis*. 2003; 14(1):12–19. [PubMed: 12748917]
- Belcher L, Kalichman SC, Topping M, Smith S, Emshoff J, Norris F, Nurss JA. Randomized trial of a brief HIV risk reduction counseling intervention for women. *Journal of Consulting and Clinical Psychology*. 1998; 66:856–861. [PubMed: 9803706]
- Bozari B, Murphy JG, Carey K. Readiness to change in brief motivational intervention: A requisite condition for drinking reductions? *Addictive Behaviors*. 2009; 33:232–235.
- Carey KB, Carey MP, Maisto SA, Henson J. Brief motivational interventions for heavy college drinkers: a randomized controlled trial. *J Consult Clin Psychol*. 2006; 74(5):943–954. [PubMed: 17032098]
- Centers for Disease Control and Prevention. HIV Surveillance Report. 2008; 20 Retrieved from <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/>.
- Cohn AM, Hunter-Reel D, Hagman BT, Mitchell J. Promoting behavior change from alcohol use through mobile technology: the future of ecological momentary assessment. *Alcohol Clin Exp Res*. 2011; 35(12):2209–2215. [PubMed: 21689119]
- Collins SE, Logan DE, Neighbors C. Which came first: the readiness or the change? Longitudinal relationships between readiness to change and drinking among college drinkers. *Addiction*. 2010; 105(11):1899–1909. [PubMed: 20854333]
- Eyrich-Garg KM. Mobile phone technology: a new paradigm for the prevention, treatment, and research of the non-sheltered “street” homeless? *J Urban Health*. 2010; 87(3):365–380. [PubMed: 20397058]
- Fisher JD, Fisher WA. Changing AIDS-risk behavior. *Psychol Bull*. 1992; 111(3):455–474. [PubMed: 1594721]
- Fisher JD, Fisher WA, Misovich SJ, Kimble DL, Malloy TE. Changing AIDS risk behavior: Effects of an intervention emphasizing AIDS risk reduction information, motivation, and behavioral skills in a college student population. *Health Psychology*. 1996; 15(2):114–123. [PubMed: 8681919]
- Freundlich M, Avery RJ, Padgett D. Care or scare: the safety of youth in congregate care in New York City. *Child Abuse Negl*. 2007; 31(2):173–186. [PubMed: 17316792]
- Grant BF, Dawson DA, Stinson FS, Chou PS, Kay W, Pickering R. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. *Drug Alcohol Depend*. 2003; 71:7–16. [PubMed: 12821201]
- Grant BF, Harford TC, Dawson DA, Chou PS, Pickering RP. The Alcohol Use Disorder and Associated Disabilities Interview schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample. *Drug Alcohol Depend*. 1995; 39:37–44. [PubMed: 7587973]
- Greene JM, Ennett ST, Ringwalt CL. Substance use among runaway and homeless youth in three national samples. *Am J Public Health*. 1997; 87(2):229–235. [PubMed: 9103102]
- Harding R, Dockrell MJ, Dockrell J, Corrigan N. Motivational interviewing for HIV risk reduction among gay men in commercial and public sex settings. *AIDS Care*. 2001; 13(4):493–501. [PubMed: 11454270]
- Heather, N., Gold, R., Rollnick, S. Readiness to Change Questionnaire: User’s Manual. Technical Report 15. Kensington, Australia: National Drug and Alcohol Research Centre, University of New South Wales; 1991.
- Heather, N., Rollnick, S. Readiness to Change Questionnaire: User’s Manual. Technical Report 19. Kensington, Australia: National Drug and Alcohol Research Centre, University of New South Wales; 1993.
- Heather N, Rollnick S, Bell A. Predictive validity of the Readiness to Change Questionnaire. *Addiction*. 1993; 88(12):1667–1677. [PubMed: 8130706]
- Kaysen DL, Lee CM, LaBrie JW, Tollison SJ. Readiness to change drinking behavior in female college students. *Journal of Studies on Alcohol and Drugs, Supplement*. 2009; 16:106–114.

- Koegel, P., Burnam, MA., Baumohl, J. The causes of homelessness. In: Baumohl, J., editor. Homelessness in America. New York: Oryx Press; 1996.
- Logan JL, Frye A, Pursell HO, Anderson-Nathe M, Scholl JE, Korthuis PT. Correlates of HIV risk behaviors among homeless and unstably housed young adults. *Public Health Rep.* 2013; 128(3): 153–160. [PubMed: 23633730]
- Masterman PW, Kelly AB. Reaching adolescents who drink harmfully: Fitting intervention to developmental reality. *Journal of Substance Abuse Treatment.* 2003; 24(4):247–255.
- Matwin S, Chang G. Readiness to change and risk drinking women. *Journal of Substance Abuse Treatment.* 2011; 40:230–240. [PubMed: 21193283]
- McCambridge J, Strang J. The efficacy of single-session motivational interviewing in reducing drug consumption and perceptions of drug-related risk and harm among young people: results from a multi-site cluster randomized trial. *Addiction.* 2004; 99:39–52. [PubMed: 14678061]
- Miller, WR., Rollnick, S. Motivational interviewing: Preparing people for change. 2. New York, NY: Guilford Press; 2002.
- Morris MD, Evans J, Montgomery M, Yu M, Briceno A, Page K, Hahn JA. Intimate injection partnerships are at elevated risk of high-risk injecting: a multi-level longitudinal study of HCV-serodiscordant injection partnerships in San Francisco, CA. *PLoS One.* 2014; 9(10):e109282.doi: 10.1371/journal.pone.0109282 [PubMed: 25286346]
- Muessig KE, Pike EC, Legrand S, Hightow-Weidman LB. Mobile phone applications for the care and prevention of HIV and other sexually transmitted diseases: a review. *J Med Internet Res.* 2013; 15(1):e1.doi: 10.2196/jmir.2301 [PubMed: 23291245]
- Naranbhai V, Abdool Karim Q, Meyer-Weitz A. Interventions to modify sexual risk behaviours for preventing HIV in homeless youth. *Cochrane Database Syst Rev.* 2011; 1:CD007501.doi: 10.1002/14651858.CD007501.pub2
- National Alliance to End Homelessness. An Emerging Framework for Ending Unaccompanied Youth Homelessness. 2012. Retrieved from: <http://www.endhomelessness.org/library/entry/an-emerging-framework-for-ending-unaccompanied-youth-homelessness>
- National Coalition for the Homeless. Homeless Youth. 2008. Retrieved from: <http://www.nationalhomeless.org/factsheets/youth.html>
- National Institute on Alcohol Abuse and Alcoholism. Helping patients who drink too much: A clinician's guide. 2005. Retrieved from: <http://pubs.niaaa.nih.gov/publications/Practitioner/CliniciansGuide2005/guide.pdf>
- Pecora PJ. Why current and former recipients of foster care need high quality mental health services. *Adm Policy Ment Health.* 2010; 37(1–2):185–190. [PubMed: 20229142]
- Prochaska, JO. Systems of psychotherapy: A transtheoretical analysis. 2. Pacific Grove, CA: Brooks-Cole; 1984.
- Pollio DE, Batey DS, Bender K, Ferguson K, Thompson S. Technology use among emerging adult homeless in two U.S. cities. *Soc Work.* 2013; 58(2):173–175. [PubMed: 23724580]
- Prochaska JO, DiClemente CC, Norcross JC. In search of how people change: Applications to the addictive behaviors. *American Psychologist.* 1992; 47(9):1102–1114. [PubMed: 1329589]
- Reardon ML, Burns AB, Preist R, Sachs-Ericsson N, Lang AR. Alcohol use and other psychiatric disorders in the formerly homeless and never homeless: prevalence, age of onset, comorbidity, temporal sequencing, and service utilization. *Subst Use Misuse.* 2003; 38(3–6):601–644. [PubMed: 12747399]
- Rice E, Lee A, Taitt S. Cell phone use among homeless youth: potential for new health interventions and research. *J Urban Health.* 2011; 88(6):1175–1182. DOI: 10.1007/s11524-011-9624-z [PubMed: 22076445]
- Rice E, Monro W, Barman-Adhikari A, Young SD. Internet use, social networking, and HIV/AIDS risk for homeless adolescents. *J Adolesc Health.* 2010; 47(6):610–613. [PubMed: 21094441]
- Rollnick, S. Readiness, importance, and confidence: critical conditions of change in treatment. In: Miller, WR., Heather, N., editors. *Treating Addictive Behaviors.* Vol. 2. New York: Plenum Press; 1998. p. 49–60.

- Rollnick S, Heather N, Gold R, Hall W. Development of a short 'readiness to change' questionnaire for use in brief, opportunistic interventions among excessive drinkers. *Br J Addict.* 1992; 87(5):743–754. [PubMed: 1591525]
- Rotheram-Borus MJ, Koopman C. Sexual risk behaviors, AIDS knowledge, and beliefs about AIDS among runaways. *Am J Public Health.* 1991; 81(2):208–210. [PubMed: 1990862]
- Ruan WJ, Goldstein RB, Chou SP, Smith SM, Saha TD, Pickering RP, Dawson DA, Huang B, Stinson FS, Grant BF. The alcohol use disorder and associated disabilities interview schedule-IV (AUDADIS-IV): reliability of new psychiatric diagnostic modules and risk factors in a general population sample. *Drug Alcohol Depend.* 2008; 92:27–36. [PubMed: 17706375]
- Rutledge SE, Roffman RA, Picciano JF, Kalichman SC, Berghuis JP. HIV prevention and attrition: challenges and opportunities. *AIDS Behav.* 2002; 6(1):69–82.
- Shelton KH, Taylor PJ, Bonner A, van den Bree M. Risk factors for homelessness: evidence from a population-based study. *Psychiatr Serv.* 2009; 60(4):465–472. [PubMed: 19339321]
- Skewes MC, Dermen KH, Blume AW. Readiness to change and post-intervention drinking among Hispanic college students living on the US/Mexico border. 2011:183–189.
- Stern SA, Merideth LS, Gholson J, Gore P, D'Amico J. Project CHAT: A brief motivational substance use intervention for teens in primary care. *Journal of Substance Abuse Treatment.* 2007; 32:153–165. [PubMed: 17306724]
- Stricof RL, Kennedy JT, Nattell TC, Weisfuse IB, Novick LF. HIV seroprevalence in a facility for runaway and homeless adolescents. *Am J Public Health.* 1991; 81(Suppl):50–53. [PubMed: 2014885]
- Tanner-Smith EE, Lipsey MW. Brief Alcohol Interventions for Adolescents and Young Adults: A Systematic Review and Meta-analysis. *Journal of Substance Abuse Treatment.* 2014; doi: 10.1016/j.jsat.2014.09.001
- Thompson RG, Hasin D. Psychiatric disorders and treatment among newly homeless young adults with histories of foster care. *Psychiatr Serv.* 2012; 63(9):906–912. DOI: 10.1176/appi.ps.201100405 [PubMed: 22706986]
- Thompson RG, Hasin DS. Cigarette, marijuana, and alcohol use and prior drug treatment among newly homeless young adults in New York City: Relationship to a history of foster care. *Drug Alcohol Depend.* 2011; 117(1):66–69. DOI: 10.1016/j.drugalcdep.2010.12.020 [PubMed: 21288659]

Table 1

Background characteristics for total sample and by condition (N=61)

	Total	Intervention (N=30)	Education (N=31)	<i>Mean (SD) or %</i>	<i>X² or t, p-value*</i>
Age (total range: 17–22)	19.28 (1.20)	18.97 (1.07)	19.58 (1.26)		<i>t</i> =2.05, <i>p</i> =.05
Race					<i>X²</i> (2)=0.02, <i>p</i> =.99
African American	36.07	36.67	35.48		
Hispanics	47.54	46.67	48.39		
Others	16.39	16.67	16.13		
Male	41.67	41.38	41.94		<i>X²</i> (1)=0.00, <i>p</i> =.97
Completed High school	49.18	43.33	54.84		<i>X²</i> (1)=0.81, <i>p</i> =.37
Employed	22.95	20.00	25.81		<i>X²</i> (1)=0.29, <i>p</i> =.59
Physically Abused	65.57	66.67	64.52		<i>X²</i> (1)=0.03, <i>p</i> =.86
Emotionally Abused	75.00	75.86	74.19		<i>X²</i> (1)=0.02, <i>p</i> =.88
Sexually Abused	31.15	40.00	22.58		<i>X²</i> (1)=2.16, <i>p</i> =.14
Forster Care	54.10	63.33	45.16		<i>X²</i> (1)=2.03, <i>p</i> =.16
Juvenile Detention	49.18	46.67	51.61		<i>X²</i> (1)=0.15, <i>p</i> =.70
Stayed on street					<i>X²</i> (2)=0.91, <i>p</i> =.64
0 times	44.16	50.00	38.71		
1–5 times	27.87	23.33	32.26		
6 times or more	27.87	26.67	29.03		

* *p*-value from Fisher's Exact Test due to low expected cell counts

Table 2

Baseline and Post-Intervention Observed Mean (Standard Deviation) Comparisons, by Condition, and Condition by Time Interaction *

	BI			EC			Interaction p value	
	Baseline Assessment		Post-Intervention Assessment	Baseline Assessment		Post-Intervention Assessment	p	Condition X Time
		p			p			
Drank	6.77 (7.20)	0.75	5.63 (7.28)	6.90 (6.97)	0.12	4.81 (6.26)	0.12	0.42
Drunk	5.53 (6.95)	0.18	2.97 (5.21)	4.68 (5.36)	0.58	4.10 (6.44)	0.58	0.50
Binged	0.27 (0.74)	0.44	0.13 (0.57)	0.25 (0.82)	0.43	0.13 (0.56)	0.43	0.94
Unprotected Sex	4.73 (6.93)	0.95	4.93 (9.31)	6.81 (10.32)	0.002	2.77 (6.03)	0.002	0.04
Number Partners	1.40 (2.28)	0.65	1.23 (2.06)	1.77 (1.41)	0.29	1.42 (1.52)	0.29	0.75
Drank Before Sex	2.77 (5.81)	0.85	3.03 (8.16)	2.19 (2.41)	0.73	2.55 (7.27)	0.73	0.91
Drunk No Condom	1.13 (2.02)	0.38	1.77 (8.20)	1.23 (1.87)	0.39	0.61 (2.70)	0.39	0.29
RTC Alcohol ^a	1.13 (0.78)	<0.01	1.53 (0.73)	1.55 (0.68)	0.78	1.58 (0.67)	0.78	0.11
	P=23.33%	P=13.33%		P=9.68%		P=9.68%		
	C=40.00%	C=20.00%		C=25.81%		C=22.58%		
	A=36.67%	A=66.67%		A=64.52%		A=67.74%		
RTC HIV Risk ^a	1.47 (0.63)	0.46	1.33 (0.71)	1.26 (0.68)	<0.05	1.55 (0.62)	<0.05	0.06
	P=6.67%	P=13.33%		P=12.90%		P=6.45%		
	C=40.0%	C=40.00%		C=48.39%		C=32.26%		
	A=53.3%	A=46.67%		A=38.71%		A=61.29%		
HIV Knowledge	7.87 (1.63)	0.23	8.20 (1.61)	7.90 (1.64)	0.05	8.39 (1.26)	0.05	0.73

* Models controlled for age

^a P=Precontemplative; C=Contemplative; A=Action

Table 3
Effect Sizes for Brief Motivation and Education Control Conditions: Within and Between Group Effects

	Within Effect: Brief Motivation		Within Effect: Education Control		Between Effect ^a	
	<i>AIRR/AOR (95%CI)</i>		<i>AIRR/AOR (95%CI)</i>		<i>AIRR/AOR (95%CI)</i>	
Times Drank	AI RR= 0.92 (0.55–1.54)		AI RR= 0.68 (0.43–1.10)		AI RR= 1.35 (0.67–2.70)	
Times Drunk	AI RR= 0.64 (0.33–1.22)		AI RR= 0.86 (0.50–1.48)		AI RR= 0.74 (0.32–1.73)	
Times Binged	AI RR= 0.51 (0.09–2.81)		AI RR= 0.46 (0.07–3.14)		AI RR= 1.11 (0.08–14.63)	
Times Unprotected Sex	AI RR= 1.02 (0.51–2.03)		AI RR= 0.39 (0.21–0.71)		AI RR= 2.64 (1.06–6.59) *	
Number of Partners	AI RR= 0.89 (0.54–1.47)		AI RR= 0.80 (0.53–1.21)		AI RR= 1.11 (0.58–2.14)	
Times Drank Before Sex	AI RR= 1.10 (0.40–3.03)		AI RR= 1.20 (0.42–3.48)		AI RR= 0.92 (0.21–3.96)	
Times Drunk No Condom	AI RR= 1.67 (0.53–5.28)		AI RR= 0.49 (0.09–2.55)		AI RR= 3.43 (0.46–25.71)	
RTC Alcohol	AOR= 3.04 (1.31–7.05)		AOR= 1.13 (0.48–2.66)		AOR= 2.68 (0.82–8.75)	
RTC HIV Sexual Risk	AOR= 0.69 (0.27–1.80)		AOR= 2.45 (1.00–5.99)		AOR= 0.29 (0.07–1.03)	
HIV Knowledge	AOR= 1.04 (0.97–1.12)		AOR= 1.06 (1.00–1.13)		AOR= 0.98 (0.90–1.08)	

^a Models controlled for age

* p<0.05

Satisfaction, acceptability, and perceived effectiveness subscale means for brief motivation and education comparison conditions (N=61)

Table 4

Evaluation Area	Brief Motivation		Education Comparison		p
	<u>Mean (SD)</u>		<u>Mean (SD)</u>		
Overall Satisfaction (<i>range=12–15</i>)	13.90 (1.21)		13.71 (1.16)		.53
Acceptability of Alcohol Content (<i>range=13–25</i>)	22.47 (2.10)		21.81 (2.64)		.28
Acceptability of HIV Sexual Risk Content (<i>range=14–25</i>)	22.40 (2.82)		22.03 (2.64)		.60
Perceived Effectiveness Regarding Alcohol Use (<i>range=10–25</i>)	19.57 (3.87)		20.81 (3.35)		.19
Perceived Effectiveness Regarding HIV Sexual Risk (<i>range=10–25</i>)	20.50 (4.22)		21.19 (3.02)		.46