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Developing an Integrated Violence Prevention for Men and Women in Treatment for Substance Use Disorders

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Abstract

Rates of past-year partner and non-partner violence perpetration (VP) in substance use disorder (SUD) treatment samples exceed 50%, with studies showing rates of past-year VP exceeding 70% when considering violence occurring with either intimate partners or non-partners. However, SUD treatment programs typically do not include VP prevention interventions, and the few studies examining the impact of SUD interventions on VP have focused exclusively on partner VP. This study summarizes results of a randomized controlled pilot study of an Integrated Violence Prevention Treatment (IVPT) designed to address VP across partner and non-partner relationships as well as predictors of post-treatment VP. Participants were men (70%) and women (30%) in SUD treatment reporting past-year VP who were randomized to either IVPT or a control condition. The IVPT involved a Motivational Interviewing session targeting interpersonal conflicts, followed by five cognitive-behavioral therapy sessions focusing on VP prevention skills. The control condition included a session including a videotape and discussion of anger management, followed by five psycho-educational sessions common for SUD settings. Results showed that VP (total, partner, and non-partner) and cocaine use significantly decreased between baseline and 3-month follow-up for both conditions, and the IVPT group showed a significant decline in alcohol use. Analyses focusing on VP during follow-up revealed that baseline cocaine use and drinking during the follow-up predicted post-treatment VP. Together, these findings suggest that IVPT is a promising intervention (feasible, appears to impact drinking, an important factor related to violence) but that additional continuing care approaches may be indicated to sustain positive outcomes.

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Keywords

aggression; injury; alcohol; drugs; treatment

Introduction

Interpersonal violence perpetration (VP) is a significant public health problem encountered by many individuals in substance use disorder (SUD) treatment settings (Bureau of Justice Statistics, 2011; Chermack et al., 2008; Chermack, Walton, & Blow, 2010; Chermack, Wryobeck, Walton, & Blow, 2006; El-Bassel, Gilbert, Witte, Wu, & Chang, 2011; Murphy & Ting, 2010). Specifically, prior research indicates that rates of past-year intimate partner VP are approximately 50%, for both men and women (Chermack, Fuller, & Blow, 2000; Chermack, Walton, Fuller, & Blow, 2001; O'Farrell & Murphy, 1995). Similarly, for SUD patients, past-year violence toward non-partners (e.g., friends, strangers, acquaintances) also tends to exceed 50% (Chermack, Fuller, & Blow, 2000; Murray et al., 2008). When accounting for involvement in both partner and non-partner VP, studies suggest that up to 70% of patients are involved in VP (Chermack, Fuller, & Blow, 2000; Chermack et al., 2001). Not only is VP common among SUD patients, but event- and daily-level research suggests that acute substance use is linked to the severity of VP in interpersonal conflict incidents (Chermack, Grogan-Kaylor, et al., 2010; Friend, Langhinrichsen-Rohling, & Eichold, 2011; Maffli & Zumbrunn, 2003; Stuart et al., 2013).

To date, research focusing on VP prevention interventions in SUD settings has not examined VP in both partner and non-partner relationships. Finally, there also is little longitudinal data on violence from pre- to post-SUD treatment (O'Farrell, Fals-Stewart, Murphy, & Murphy, 2003; Taft et al., 2010), particularly regarding predictors of partner, non-partner, and total (partner plus non-partner) VP. The present study includes data from a pilot trial of an Integrated Violence Prevention Treatment (IVPT) on VP outcomes across partner and non-partner relationships and substance use outcomes, as well as predictors of post-treatment VP across relationship types (partner, non-partner, and total VP).

Despite VP being a common problem in SUD settings, treatment programs typically do not include targeted VP prevention interventions (Meis, Murphy, & Winters, 2010). However, evidence supports the effectiveness of cognitive-behavioral therapies (CBTs) in reducing anger and aggression in other samples (Deffenbacher, Oetting, & DiGiuseppe, 2002; Del Vecchio & O'Leary, 2004; Edmondson & Conger, 1996; Froh, Leis, & DiGiuseppe, 2001). Research evaluating interventions designed to prevent VP across relationship types in SUD treatment populations is lacking, though two exceptions also suggest the promise of CBTs. First, Behavioral Couples Therapy (BCT) has been associated with significant reductions in substance use as well as partner violence (O'Farrell & Fals-Stewart, 2000; O'Farrell, Murphy, Stephan, Fals-Stewart, & Murphy, 2004; Schumm, O'Farrell, Murphy, & Fals-Stewart, 2009). While there is evidence that BCT is associated with reductions in partner VP, it can only be delivered to the extent that SUD treatment patients have a spouse or partner who is willing and able to engage in treatment. Studies across treatment settings indicate that the majority (60%-80%) of SUD patients report not being married or not cohabitating with a

partner and that non-partner violence is also common. Thus, BCT is not applicable to a large proportion of SUD treatment patients who engage in violence across different relationship types (Chermack & Blow, 2002; Chung, Langenbucher, Labouvie, Pandina, & Moos, 2001; Joe, Simpson, & Broome, 1999).

Easton et al. (2007) conducted a pilot trial of a group-based CBT protocol (Substance Abuse and Domestic Violence; SADV) among alcohol dependent males entering SUD treatment who also had a past-year arrest for domestic violence. This intervention focused on participants' substance use, partner violence, and the inter-relationship between the two. Post-treatment results were promising in that participants receiving the SADV intervention reported significant reductions in alcohol use compared with a group receiving Twelve Step Facilitation (TSF) therapy. Furthermore, the SADV group showed a trend toward decreased frequency of partner violence relative to the TSF group, although with approximately 40 participants in each group, this study may not have been powered to detect significant between-group differences for 2 active interventions. However, 6-month follow-up results indicated no significant between-group differences in alcohol or partner violence measures. Finally, one recent study also with a modest sample size ($N = 52$) examined an intervention targeting partner violence only and included women, but found no significant differences in post-intervention partner violence and substance use outcomes compared with CBT for substance use (Kraanen, Vedel, Scholing, & Emmelkamp, 2013). Because many women in SUD treatment samples report VP across partner and non-partner relationships (Chermack et al., 2001; Schumm et al., 2009), research is needed regarding individual interventions including women that target violence across relationships.

CBT skills-based approaches provide guidance for developing effective interpersonal VP interventions for SUD patients; however, there is a need for SUD treatments that target VP across relationship types (i.e., both partner and non-partner), for both men and women, regardless of their relationship status. Such interventions may be enhanced through incorporating motivational interviewing (MI; Miller & Rollnick, 1991) which focuses on increasing patients' intrinsic motivation for change and incorporating strategies to reduce ambivalence about change. MI has a strong evidence-base and has been shown to be effective with substance abuse, in addition to other problems (Bien, Miller, & Tonigan, 1993; Burke, Arkowitz, & Dunn, 2002; Hettema & Hendricks, 2010; Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). For example, research demonstrates relationships between motivation and treatment retention, treatment engagement, and positive post-treatment outcomes for alcohol use, drug use, and criminal activity (DeLeon & Iwata, 1996; Joe, Simpson, & Broome, 1998; Simpson, Joe, & Rowan-Szal, 1997). MI may be especially pertinent for reducing interpersonal conflict given the results of Project MATCH in which participants high in anger benefited most from motivational enhancement therapy (an MI-based intervention; (Project MATCH Research Group, 1997) and Scott and Wolfe's (2003) report that motivation to change is related to treatment outcome for men in domestic violence treatment. Taken together, these findings suggest that MI may be useful in combination with CBT-based techniques for substance use and interpersonal violence.

The goal of the present study was to pilot test an IVPT, compared with an attention control condition. Given prior research on the efficacy of MI and CBT-based approaches, IVPT was

designed to combine MI techniques with CBT to deliver structured, violence-specific content while minimizing patients' resistance to the intervention. The present study is an initial step in developing an intervention approach that targets violence more broadly (both partner and non-partner VP) than prior approaches. Furthermore, given that few studies have presented longitudinal data regarding violence and that no studies have examined partner, non-partner, and total VP longitudinally in the same SUD sample, the present study addresses a gap in the literature by providing information regarding factors related to post-treatment VP across relationship types. Based on prior studies, we hypothesize that substance use outcomes (e.g., alcohol use, cocaine use) would be positively related to VP outcomes.

Method

Study Settings and Procedure

After receiving institutional review board approval, patients entering SUD treatment programs (including community residential centers, intensive outpatient, and regular outpatient treatment programs) were recruited by research assistants. Those interested in participating were consented and completed screening measures (US$10 remuneration) to determine eligibility for participation in the randomized controlled trial (RCT). Approximately 95% of those approached (n = 489) were screened and 75% (n = 352) reported any past-year physical assault VP on a modified version of the Revised Conflict Tactics Scale (CTS-2 described below; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Exclusion criteria for the RCT were reporting no past-year physical assault (n = 137), being in treatment for more than 30 days at the time of screening (n = 30), or living outside the study catchment area (n = 81). Furthermore, those with intravenous heroin/opioid dependence (n = 11) were excluded due to somewhat unique treatment needs (e.g., opioid substitution) that were not provided through the study sites, and those with a diagnosis of schizophrenia (n = 17) were excluded (due to clinical considerations regarding co-occurring psychotic symptoms, and concerns about capacity to consent). Of those screened, 8 (2%) refused participation or discontinued treatment at the study site. Of 205 screened patients eligible for inclusion, 194 (95%) completed at least part of a baseline assessment (e.g., self-report measures) and were compensated US$30. The baseline assessment also included a semi-structured interview regarding alcohol, drug use, and interpersonal conflict incidents during the 180 days prior to treatment, and 178 participants completed the semi-structured interview and were eligible for randomization.

During the baseline assessment 39 (22%) of those 178 were found to no longer meet eligibility criteria (19 lived out of the study catchment area, 20 for other reasons combined) and were not randomized. Ten patients dropped out of treatment, 5 refused to continue with the RCT, 5 were missed (still considered in treatment, but staff were unable to locate these patients to coordinate involvement with the RCT), leaving a total of 119 patients who were randomized to either the IVPT (n = 57) or control group (n = 62). Follow-up assessments (which mirrored baseline measures) were completed for 75 patients, but could not be completed for those who were incarcerated at the time of follow-up (n = 17) or deceased (n

= 1), resulting in a follow-up rate of 74% (75/101). Other reasons for not completing follow-up included difficulty locating the patient (n = 7) and missed appointments/other (n = 9).

Intervention Protocol

Participants were asked to attend a total of six IVPT or control sessions over a maximum of 8 weeks. Similar to other intervention trials (Kadden et al., 1992; Miller, Zweban, DiClemente, & Rychtarik, 1992), those who missed a session were promptly contacted to reschedule the appointment and if verbal contact was not made within 48 hr, letters were sent to request rescheduling. Attempts were made to schedule sessions 1 week apart; when this was not possible (e.g., due to participant preference or leaving residential treatment), participants could attend two sessions in 1 week. Participants were not compensated for attending therapy sessions and they were allowed to engage in other regular treatment activities at the treatment site. Both the IVPT and control conditions were delivered by master's-level therapists trained in social work or psychology.

IVPT Intervention Condition

This condition consisted of six MI-CBT-based individual therapy sessions targeting interpersonal violence and substance use behaviors (see Table 1 for a description of session content). Session 1 was designed to heavily incorporate MI principles and exercises to strengthen participants' motivation to change and to help clarify the primary areas to target during the remaining sessions. Sessions 2 to 6 also incorporated MI principals (e.g., rolling with resistance, supporting self-efficacy), but were primarily skills-focused and included CBT-based content. Therapists were trained in the delivery IVPT by the investigators and doctoral-level psychologists who all had experience with the delivery of CBT and MI. Training involved a 3-day workshop and therapists received weekly (bi-weekly after the first year) individual supervision from a doctoral-level psychologist that involved reviewing audio-taped sessions, modeling of intervention techniques, and role-playing.

Control Condition

This six-session individual therapy attention condition was designed to equate with the number and length of sessions in the IVPT condition. Control condition topics were primarily psycho-educational and were similar to what might typically be encountered during SUD treatment (see Table 1). These sessions were not designed to boost motivation, insight into anger, or provide anger management skills, although the initial session included some content on anger management. Therapists were trained to deliver the control sessions in a didactic manner.

Measures

VP in partner and non-partner relationships—Eligibility for the RCT was assessed by a modified version of the CTS-2 (Straus et al., 1996) which measured both VP and victimization in intimate partner relationships over the past year. Like prior research (Chermack & Blow, 2002), participants completed parallel versions of the CTS for both partner *and* non-partner relationships separately. Those who reported any partner or non-partner physical assault perpetration in the past year were eligible for randomization.

The Time Line Follow Back–Aggression Module (TLFB-AM)—The main outcome measure for violence was derived from the TLFB-AM (Chermack & Blow, 2002; Chermack et al., 2006). The TLFB-AM was delivered as part of the baseline semi-structured interview and asked participants to identify specific days of interpersonal conflict during the past 6 months before treatment. Participants described the relationship (e.g., spouse, friend, etc.) with the other person involved in the conflict which was coded as a partner or non-partner. Then, participants were provided with a list of the physical assault and injury behaviors assessed by the CTS and they identified which behaviors took place during the conflict incident (behaviors perpetrated by participants toward others as well as behaviors from others to participants). Participants also completed the TLFB-AM for the past 3 months at 3- and 6-month follow-up assessments. The primary VP outcome measure involved items from the physical assault scale in the TLFB-AM. To account for different time frames assessed at baseline (past 6 months) and the 3- and 6-month follow-ups (each assessing 3 month time frames), the number of VP events during the time frame were divided by the number of months assessed (resulting in the average amount of violent incidents per month). Thus, the VP outcome measures included baseline and follow-up measures of the average frequency per month of partner VP, non-partner VP, and both combined. Similarly, we also derived measures of physical assault violence victimization (VV) from the TLFB-AM for supplemental analyses examining potential changes at 3-and 6-month follow-ups compared with baseline for victimization from partners, non-partners, or both combined. VP and VV measures at baseline were highly correlated (*r*s = .92-.99).

Alcohol and drug consumption—Participants also completed the TLFB (Maisto, Sobell, Cooper, & Sobell, 1979; Sobell, Sobell, Leo, & Cancilla, 1988) for alcohol and drug use at baseline reporting on their substance use during the past 6 months before treatment and then again for the preceding 3-month period at 3- and 6-month follow-up assessments. Given the support in the literature regarding relationships between alcohol and cocaine use with violence (Chermack & Blow, 2002; Chermack, Walton, & Blow, 2010; Licata, Taylor, Berman, & Cranston, 1993; Moore et al., 2008; Murphy & Ting, 2010; Stuart et al., 2013), analyses focused on alcohol and cocaine use which were calculated as percent of days on which use occurred.

Other measures—Demographic characteristics of the sample were assessed by self-report including age, gender, race, and type of treatment setting (outpatient vs. residential). Due to sample characteristics, race was recoded to reflect White or Caucasian and of other racial group for the present study. A brief self-report measure of health services (e.g., individual and group sessions for alcohol/drug problems, psychiatric issues, anger management/ aggression prevention) received during the intervention phase of the trial was administered to participants ($n = 64$) following their completion of the IVPT/ Control interventions.

Data Analysis

Descriptive statistics (means, standard deviations, proportions) were calculated for participants' demographics, VP, and substance use outcomes of interest. Independent-samples *t* tests were used to assess whether participants in the intervention groups differed on baseline VP and substance use characteristics and demographics, and whether

participants who completed followup differed from those who did not. Due to the correlated structure of this data (i.e., repeated measures at baseline and 3- and 6- month follow-up assessments), we used generalized estimating equations (GEE), which also allow for observed variable distributions (e.g., binary/logit, continuous/negative binomial). Because GEE uses available pairs to estimate correlation parameters for the entire sample, an intent-to-treat approach was used where all randomized participants were included in these analyses. The GEE analyses were used to evaluate the effects of the interventions over time with regard to the frequency of partner and non-partner VP (and both combined to account for total VP involvement), percent days of alcohol use, and percent days of cocaine use. GEE models (e.g., examining group, time, Group × Time interaction effects) for these outcomes examined changes from baseline to the 3-month follow-up, as well as changes from baseline to the 6-month follow-up. Due to over-dispersion of the dependent variables, negative binomial distributions were used. Furthermore, three separate logistic regression analyses were used to evaluate predictors (demographics, treatment condition, percent of days using alcohol and cocaine prior to baseline and during follow-up, VP prior to baseline) of any VP (partner, non-partner, and total violence) during the post-treatment follow-up period. Finally, supplemental analyses were conducted. First, although the study was not sufficiently powered to study potential gender differences (either through examination of interactions involving gender or separate analyses by gender), we examined whether there were bivariate differences in VP and victimization frequency for men and women. Finally, analogous to our primary analyses, we conducted supplementary analyses to examine VV outcomes over time (using GEE) and predictors of victimization during the follow-up (using logistic regression). We also explored potential group differences in services (e.g., alcohol, drug, anger management) received during RCT participation.

Results

Study Sample and Characteristics

Participants randomized to either condition did not significantly differ on demographic characteristics (age, gender, race), baseline violence levels (partner, non-partner, and total physical assault), or baseline cocaine and alcohol use (see Table 2, column 1). Of the 119 randomized, most were male (70.0%) and their mean age was 35.3 years (SD = 10.8). Approximately half were White (47.9%), 37.0% were Black, and 15.1% were other minorities. About half (52.9%) were recruited from residential settings (vs. 47.1% from outpatient). On average, participants completed 3.6 (SD = 2.2) intervention sessions, and this was not significantly different across the two intervention groups. Those participants who completed follow-up (IVPT n = 37, Control n = 38) did not significantly differ on baseline demographics, violence, and substance variables based on intervention group. Furthermore, participants who completed follow-up did not differ on these characteristics compared with those who did not complete follow-up assessments. Table 2 displays descriptive information regarding the primary outcomes (average number of partner, non-partner, and total violent events per month, percentage of days during each period on which alcohol and cocaine use occurred) at baseline and follow-up assessments.

Impact of IVPT on VP and Substance Abuse Outcomes

Results of the GEE models examining intervention effects on the three types of violence (partner, non-partner, total VP) and alcohol and cocaine use are summarized in Table 3. Separate models were conducted for baseline to the 3-month follow-up and baseline to the 6-month follow-up. At 3-month follow-up, significant time effects were observed for all three types of violence and cocaine use, but the group by time effects were not significant. There was a main effect for group on alcohol use, and a significant group by time interaction such that the intervention group decreased their alcohol use significantly more than the control group ($p < .05$). From baseline to the 3-month follow-up, the IVPT group decreased in the percentage of days of alcohol use from an average of 15.7% ($SD = 21.8\%$) to 3.0% ($SD = 7.1\%$), whereas the Control group decreased from an average of 13.5% ($SD = 22.8\%$) to 9.5% ($SD = 24.7\%$). From baseline to 6-month follow-up, total violence was significantly lower at follow-up compared with the baseline, and there were no significant main effects or group by time interactions.

Predictors of Violence During 6-Month Follow-Up

Of the three logistic regression models (see Table 4) evaluating demographic characteristics, treatment condition, baseline, and follow-up percent days of alcohol and cocaine use, and baseline violence as predictors of violence during the follow-up period, only the models predicting non-partner and any VP (either partner or non-partner) were statistically significant. In these two models, older age was associated with decreased odds of violence (odds ratios [ORs] = 0.91 and 0.93, respectively), whereas baseline cocaine use (ORs = 1.03) and alcohol use during the follow-up period (ORs = 1.05) were associated with increased odds of violence. Treatment group, race, baseline alcohol use, baseline VP, and cocaine use post-treatment were not significantly associated with VP during the follow-up period.

Supplemental Analyses

Analyses were also conducted using partner, non-partner, and total physical assault victimization variables as dependent measures, analogous to perpetration outcomes. GEE analyses revealed no significant group by time interaction effects, although there were significant time effects (partner VV reduced at 3- and 6-month follow-ups, total VV reduced at 3-month follow-up). According to logistic regression analyses, baseline cocaine use was significantly associated with non-partner VV (OR = 1.03, $p < .05$), and younger age and alcohol use during follow-up were significantly (all ps $< .05$) associated with both post-treatment non-partner VV (age: OR = 0.94; alcohol use OR = 1.04) and any VV (age: OR = 0.90; alcohol use: OR = 1.04).

Regarding analyses for gender differences, there were no significant differences between men and women participants on any measures of VP at baseline or 3- and 6-month follow-ups, although women reported a higher frequency per month of partner VV ($M = 1.34$, $SD = 4.02$) than men at baseline ($M = 0.13$, $SD = 0.45$); $t(72) = 2.06$, $p < .05$. Finally, analyses were conducted on items assessing health services received during RCT involvement ($n = 64$). Only one item was significant between groups, participants in the control condition (28%) were more likely than those in IVPT (7%) to report receiving individual or group

services targeting anger management or violence prevention (not including study sessions), $\chi^2(1) = 3.88$, $p < .05$. This raises the possibility that outcomes for those in the control session could have been affected by receiving non-study-related anger-management services, although this finding should be interpreted with caution due to relatively low number of participants completing these measures.

Discussion

The present study is the first randomized controlled pilot study of a combined MI and CBT intervention designed to target VP *across* relationship types among male and female SUD treatment patients. Although, this small pilot found no significant group by time interactions for violence outcomes when comparing the IVPT with a control group involving the same number of sessions (similar to Kraanen et al.'s, 2013, study which also had a small sample size), it is important to note that pilot studies do not often provide accurate estimates of effect size or intervention impact (Kraemer, Mintz, Noda, Tinklenberg, & Yesavage, 2006). Rather, pilot studies are necessary for establishing the feasibility and acceptability of interventions, developing intervention and recruitment procedures, and collecting informative data on the range of behavioral outcomes to fully power future studies (Leon, Davis, & Kraemer, 2011).

With regard to behavioral outcomes, although there were no significant group by time interaction effects for VP, there was a significant group by time interaction indicating that the IVPT group reduced their alcohol use more than the Control group from baseline to the 3-month follow-up. Furthermore, there were significant time effects showing reductions between baseline and the 3-month follow-up for cocaine use and all VP outcomes (partner, non-partner, total), as well as time effects between baseline and the 6-month follow-up for total VP. In supplemental analyses examining victimization outcomes, we also found reductions in partner VV at 3 and 6 months, and total VV at 3 months. It is difficult to make direct comparisons between the results of the present study and prior work given differing follow-up time periods, lack of information in other studies regarding non-partner violence rates, and differing socioeconomic characteristics of study samples. Despite these differences, VP-related outcomes in the present study appeared to compare well to other studies of changes in violence post-SUD treatment. For example, BCT has resulted in reductions in partner violence to approximately one third to one half of pre-treatment levels (O'Farrell et al., 2004). Our results compare well with a study of a CBT intervention targeting domestic violence among men (Easton et al., 2007), in that participants in the present study reported a mean of 0.3 ($SD = 4.9$) violent incidents (total VP summing both partner and partner VP incidents) per month during follow-up and Easton and colleagues' participants reported a mean of 1.0 ($SD = 3.7$) partner VP incidents per month. Finally, Kraanen et al. (2013) also found significant reductions in partner VP in the 8 weeks following either an integrated partner VP intervention or CBT for substance abuse.

Analyses examining VP post-treatment revealed that baseline cocaine use and drinking during the follow-up period were associated with non-partner VP and total violence (supplemental analyses of VV had similar findings in terms of follow-up drinking, but baseline cocaine use was only related to non-partner VV). These findings are consistent with

prior BCT studies (O'Farrell & Fals-Stewart, 2000; O'Farrell et al., 2004; Schumm et al., 2009) and also studies across a range of methodologies that highlight associations with alcohol and/or cocaine with violence (Chermack & Blow, 2002; Chermack, Grogan-Kaylor, et al., 2010; Lipsey, Wilson, Cohen, & Derzon, 1997; Moore et al., 2008; O'Farrell & Fals-Stewart, 2000; O'Farrell et al., 2004; Schumm et al., 2009; Smith, Homish, Leonard, & Cornelius, 2012; Stuart et al., 2013). The impact of pre-treatment cocaine use on violence during follow-up may be a marker of greater problem severity or patient complexity, and along with other research (Taft et al., 2010) suggests that future research and interventions should more explicitly examine patient complexity factors (e.g., type of substance use, alcohol/drug problem severity, violence history, anger/hostility, antisocial characteristics). We were not able to examine whether acute or event-specific alcohol or cocaine use was related to violence during the follow-up with the present methodology, thus it is not clear whether alcohol or cocaine use preceded or followed involvement with violence (or both). Thus, further research is needed to examine the inter-relationships over time among alcohol, cocaine use, and VP among SUD treatment patients. It was somewhat surprising that VP in the 6 months prior to treatment was not related to follow-up VP. It is possible that this pattern of findings suggests the relative importance of substance use involvement (or conversely, remission) as a predictor of violence in SUD treatment populations.

Limitations of this study should also be noted. Data collected in this trial relied on retrospective self-report, which may be subject to recall and demand biases, although prior work supports the reliability and validity of patients' self-reports of substance use (Chermack, Roll, et al., 2000; Large et al., 2012). The inclusion criteria used for this pilot may have been too liberal (e.g., past-year violence), resulting in a floor effect (~50% of the sample did not report violence in the 6 months prior to baseline) and insufficient power to detect intervention effects over a relatively short follow-up period. Furthermore, the study follow-up rate was modest (74% of those eligible for follow-up). At our largest recruitment site, several participants were in residential treatment as a result of prior criminal justice involvement, and we were not able to follow up with several participants who were incarcerated after discharge from residential care. We do not have data regarding whether these incarcerations were associated with past criminal justice involvement (e.g., participants spent time in residential care while awaiting sentencing) or new offenses. Thus, future studies should obtain more information regarding criminal justice involvement, and/or collaborate more explicitly with regard to providing treatment interventions at the optimal point in time for participants involved with the criminal justice system (e.g., at or around the time of release from controlled environments, or bridging the transition from controlled environments to the community).

This small pilot study also lacked sufficient sample size and power to more comprehensively examine potential gender differences in violence or response to treatment (e.g., separate analyses for men and women, power to detect interaction effects involving gender). Furthermore, we were not able to examine severe violence explicitly (e.g., violence resulting in injury) due to the low frequency of such behaviors with a small sample and we lacked information on motivations related to violent behaviors. It should be noted that gender differences in violence may be more likely to be identified when more severe measures are examined (e.g., male perpetrated violence is more likely to result in injuries) and/or if

motivations associated with violence are examined (Cantos, Neidig, & O'Leary, 1994; Chermack, Grogan-Kaylor, et al., 2010; Hamby, 2005). Thus, there is a critical need for larger studies including both men and women to more adequately examine potential gender differences in intervention response, whether factors associated with treatment outcomes differ for men and women, and to enable more refined analyses in terms of gender differences in violence severity and/or injury outcomes.

Finally, the control condition also contained content that could affect relapse prevention for substance use and violence outcomes (e.g., anger management and discussion of options, psycho-education and discussion of substance use consequences, facilitating exercise, sober recreation and leisure activities, etc.). Furthermore, supplemental analyses raised the possibility that those in the control session may have received more "anger management" sessions (outside of study participation) than those in the intervention condition. Given that this RCT's control condition was characteristic of an active intervention rather than a no-treatment control, that those in the control condition may have had more non-study anger management sessions, and because our sample was relatively small, the present study was not powered to detect differences between the treatment conditions. Inclusion of a no-treatment control group may have yielded stronger effects for the IVPT in comparison, yet this remains to be tested. Our findings also raise the possibility that interventions targeting substance use and relapse prevention may have promise to reduce violence outcomes.

To summarize, despite the important relationships between substance use and violence, and the high rates of violence among SUD treatment samples (Brown, Werk, Caplan, Shields, & Seraganian, 1998; Chermack, Fuller, & Blow, 2000; Chermack et al., 2001; Murphy, Winters, O'Farrell, Fals-Stewart, & Murphy, 2005; O'Farrell & Murphy, 1995), violence is rarely addressed directly in SUD treatment or examined as a behavioral outcome in treatment studies (Meis et al., 2010). The findings from this initial pilot study have several implications for further intervention development and refinement. For example, the similar violence outcomes following both an intervention primarily targeting violence prevention (IVPT) and a control condition targeting substance use issues, as well as the finding that drinking during the follow-up period was associated with violence during follow-up, suggest the importance of focusing on substance use reduction as a key aspect of violence prevention approaches in SUD treatment samples. The findings that there were less significant time effects in analyses focusing on the 6-month follow-up period also suggest that more prolonged intervention approaches and/or ongoing monitoring/counseling protocols may be needed to sustain treatment gains and prevent violence and SUD remission. Given that the present study and other SUD treatment samples continue to identify significant rates of violence among SUD treatment patients (Brown et al., 1998; Chermack, Fuller, & Blow, 2000; Chermack et al., 2001; Murphy et al., 2005; O'Farrell & Murphy, 1995), the development of and refinement of treatments that reduce these problems remains necessary to benefit the public health and improve the outcomes of SUD treatment.

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Biographies

Stephen T. Chermack, PhD, is the chief of the VA Ann Arbor Mental Health Service, a licensed clinical psychologist, and an associate professor in the University of Michigan's Department of Psychiatry. His primary research interests include substance use and violence, and interventions integrating motivational interviewing and cognitive-behavioral therapy.

Erin E. Bonar, PhD, is a licensed clinical psychologist and an assistant professor at the University of Michigan's Department of Psychiatry. She earned her doctorate in clinical psychology from Bowling Green State University in 2011. She has expertise in substance use behavior among young adults and motivational interviewing interventions.

Mark A. Ilgen, PhD, is a licensed clinical psychologist, an associate professor at the University of Michigan's Department of Psychiatry, and research investigator with the Ann Arbor VA HSR&D Center of Excellence. He has published more than 120 peer-reviewed articles focusing primarily on substance use disorders and co-occurring problems.

Maureen A. Walton, PhD, is a community psychologist and an associate professor at the University of Michigan's Department of Psychiatry. She has published more than 83 peer-reviewed articles and has expertise in screening and brief interventions based on motivational interviewing and research on substance use disorders.

Rebecca M. Cunningham, MD, is an associate professor and director of the Injury Center in the University of Michigan's Department of Emergency Medicine, and the Department of Health Behavior and Health Education, and is the associate director of the Flint Youth Violence Prevention Center. She has an extensive publication record in ED-based research.

Brenda M. Booth, PhD, has been an investigator in substance abuse research since 1985, primarily in aspects of health services research and testing interventions. She has published more than 123 peer-reviewed articles and has expertise in biostatistics, epidemiology, and health care organizations, longitudinal data, categorical data, and survival analysis.

Frederic C. Blow, PhD, is a research scientist in the Department of Veterans Affairs, a professor and director of the substance abuse and mental health services outcomes and translation sections in the University of Michigan Department of Psychiatry, and has published more than 257 peer-reviewed articles.

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Table 1

Summary of Intervention and Control Session Content.

Session	IVPT	Control
1	Information about conflict and substance use Personalized feedback (prior experiences with conflict, risk factors) Weighing pros and cons	Video about anger and aggression triggers Discussion of potential anger management strategies
2	Anger arousal and conflict escalation Process of making changes Identifying triggers and warning signs Initial review of “tools” Time out	Physiological effects of substances Identify myths related to substance misuse
3	Avoiding risky situations/people Calm-down techniques (e.g., deep breathing) Importance of social support	Video about relationship between HIV/AIDS and substance misuse Ways in which substance misuse effects interpersonal relationships Identify myths related to HIV/AIDS
4	Changing expectations Problem solving	Importance of nutrition and exercise Identify possible unhealthy substitutes for alcohol/drugs (e.g., caffeine, nicotine)
5	Communication/Listening skills Assertiveness Conflict resolution	Importance of recreation and leisure Identify healthy, sober activities
6	Review of material “My most effective tools” Coping plan Summary	Time management skills Review of material

Note. IVPT = Integrated Violence Prevention Treatment.

Table 2

Descriptive Data (*M* [*SD*]) for VP and Substance Use Outcome Variables at Each Time Point.

	Baseline (6-Month Pre-Treatment)	3-Month Follow-Up	6-Month Follow-Up
Partner VP—Average number of events per month			
IVPT	0.59 (2.31)	0.07 (0.29)	0.07 (0.28)
Control	0.19 (0.73)	0.00 (0.00)	0.04 (0.13)
Overall	0.39 (1.70)	0.04 (0.21)	0.05 (0.22)
Non-partner VP—Average number of events per month			
IVPT	0.15 (0.74)	0.03 (0.09)	0.09 (0.17)
Control	0.17 (0.33)	0.01 (0.05)	0.11 (0.29)
Overall	0.16 (0.56)	0.02 (0.08)	0.10 (0.24)
Total VP—Average number of events per month			
IVPT	0.76 (2.40)	0.11 (0.31)	0.16 (0.32)
Control	0.37 (0.76)	0.01 (0.05)	0.15 (0.31)
Overall	0.56 (1.76)	0.06 (0.23)	0.16 (0.31)
Percentage of days with alcohol use			
IVPT	15.7 (21.8)	3.0 (7.1)	14.8 (30.0)
Control	13.5 (22.8)	9.5 (24.7)	12.6 (25.9)
Overall	14.6 (22.3)	6.2 (18.2)	13.7 (27.9)
Percentage of days with cocaine use			
IVPT	20.3 (28.9)	2.5 (8.7)	9.0 (33.9)
Control	16.8 (23.7)	2.6 (6.9)	5.5 (18.1)
Overall	18.0 (26.4)	2.5 (7.8)	7.2 (27.1)

Note. VP = violence perpetration; IVPT = Integrated Violence Prevention Treatment.

Table 3

Generalized Estimating Equation Analyses Evaluating Intervention Versus Control Group on VP, Alcohol, and Cocaine Variables From Baseline to 3-Month Follow-Up and Baseline to 6-Month Follow-Up.

	M3 Estimate (*SE*)	M3 IRR [95% CI]	M6 Estimate (*SE*)	M6 IRR (95% CI)
Partner VP				
Intervention group	0.74 (0.63)	2.09 [0.61, 7.21]	0.58 (0.47)	1.78 [0.71, 4.48]
Time	−0.19 (0.09)	0.83 [0.69, 0.99]*	−0.08 (0.04)	0.92 [0.85, 1.01]
Intervention Group × Time	−0.34 (0.32)	0.71 [0.38, 1.33]	−0.18 (0.16)	0.84 [0.62, 1.14]
Non-partner VP				
Intervention group	−1.54 (1.76)	0.21 [0.01, 6.76]	−0.1 (1.06)	0.91 [0.11, 7.21]
Time	−2.98 (1.03)	0.05 [0.01, 0.38]**	−0.25 (0.25)	0.78 [0.48, 1.27]
Intervention group × Time	1.42 (1.3)	4.14 [0.32, 52.75]	−0.02 (0.44)	0.98 [0.42, 2.29]
Total VP				
Intervention group	−1.18 (1.28)	0.31 [0.03, 3.79]	1.02 (0.76)	2.78 [0.63, 12.31]
Time	−3.81 (0.95)	0.02 [0.00, 0.14]***	−0.46 (0.21)	0.63 [0.42, 0.95]*
Intervention group × Time	1.89 (1.09)	6.64 [0.78, 56.44]	−0.3 (0.33)	0.74 [0.39, 1.41]
Alcohol use				
Intervention group	1.72 (0.87)	5.59 [1.01, 31]*	0.34 (0.62)	1.40 [0.42, 4.71]
Time	−0.17 (0.4)	0.84 [0.38, 1.83]	0.05 (0.20)	1.05 [0.72, 1.55]
Intervention group × Time	−1.43 (0.63)	0.24 [0.07, 0.81]*	−0.05 (0.29)	0.95 [0.53, 1.70]
Cocaine use				
Intervention group	1.06 (0.93)	2.9 [0.47, 18.06]	0.23 (0.67)	1.26 [0.34, 4.64]
Time	−1.86 (0.45)	0.16 [0.06, 0.38]***	−0.55 (0.3)	0.57 [0.32, 1.03]
Intervention group × Time	−0.85 (0.77)	0.43 [0.09, 1.95]	−0.01 (0.48)	0.99 [0.39, 2.55]

Note. VP = violence perpetration.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

Predictors of Partner and Non-Partner Violence During Post-Treatment Follow-Up Period.

	Partner Violence	Non-Partner Violence	Total Violence
	OR (95% CI)	**OR (95% CI)**	**OR (95% CI)**
Age	0.95 (0.87-1.04)	**0.91 (0.84-0.98)** *	**0.93 (0.87-0.99)** *
Male [ref = female]	0.14 (0.02-0.89) *	1.66 (0.34-8.14)	0.67 (0.19-2.40)
Minority [ref = White]	1.83 (0.33-10.11)	1.70 (0.38-7.65)	1.32 (0.39-4.43)
IVPT group [ref = control]	2.91 (0.54-15.73)	1.65 (0.40-6.85)	1.42 (0.42-4.82)
Baseline percent days cocaine	1.02 (0.98-1.05)	**1.03 (1.01-1.06)** *	**1.03 (1.01-1.05)** *
Baseline percent days alcohol	1.02 (0.99-1.06)	0.98 (0.94-1.02)	1.00 (0.97-1.02)
Baseline partner physical assault (any)	1.37 (0.20-9.55)	—	—
Baseline non-partner physical assault (any)	—	1.94 (0.39-9.65)	—
Baseline any physical assault	—	—	1.46 (0.42-4.82)
Follow-up percent days cocaine	0.98 (0.91-1.05)	1.01 (0.96-1.06)	1.00 (0.96-1.04)
Follow-up percent days alcohol	1.03 (0.98-1.08)	**1.05 (1.01-1.10)** *	**1.05 (1.01-1.08)** **
	Model $\chi^2(9) = 12.16$, *ns*	**Model $\chi^2(9) = 24.21$, $p < .01$**	**Model $\chi^2(9) = 20.49$, $p < .05$**

* $p < .05$.

** $p < .01$.