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ASSOCIATIONS BETWEEN POST-TRAUMATIC STRESS DISORDER SYMPTOMS AND ALCOHOL AND OTHER DRUG PROBLEMS: IMPLICATIONS FOR SOCIAL WORK PRACTICE

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Abstract

This study examines the associations between alcohol and other drug problems (AOD) and post-traumatic stress disorder (PTSD) symptoms in 499 women recruited from outpatient treatment programs for AOD problems and the general community in western New York. The women were divided into three groups: no-AOD, past-AOD, and current-AOD. The current-AOD group was further subdivided into groups based on alcohol, marijuana, and cocaine misuse. Group comparisons on PTSD symptoms revealed that the current-AOD group experienced more PTSD symptoms than the no-AOD and past-AOD groups. The alcohol and cocaine misuse groups experienced more PTSD symptoms overall and for each symptom cluster than the no-AOD and past-AOD groups, but did not differ from each other or the marijuana group on PTSD symptoms. These findings suggest that individuals who have AOD problems should be assessed for PTSD symptoms and provided with trauma-specific interventions when warranted. Trauma-informed care may benefit those in AOD treatment. Individuals who have PTSD symptoms should be assessed for AOD problems as well.

Keywords

PTSD; alcohol and other drug problems; social work practice

Research shows that there is an association between post-traumatic stress disorder (PTSD) and alcohol and other drug (AOD) problems (see Chilcoat and Menard 2003). Comorbidity research has consistently shown high concordance rates between PTSD and AOD problems in both community and clinical samples (Kessler et al. 1995; Stewart 1996; Rosenberg et al. 2001). In order to provide effective treatment to those with comorbid PTSD and AOD problems, the relationship between AOD problems and PTSD symptoms must be understood from the perspective of how each affects the development and course of the other. Individuals who have AOD problems with co-occurring PTSD have a more severe

clinical profile (Najavits, Weiss, and Shaw 1999), are at higher risk for relapse (Brown, Stout, and Mueller 1996; Brown 2000), and have poorer psychosocial outcomes (Ouimette et al. 1997) than those without PTSD. Despite the frequent co-occurrence of PTSD symptoms and AOD problems, treatment typically addresses one problem rather than attending to the complexities of these interrelated problems. The need for treatment to address these interrelated problems is particularly salient for women.

Research consistently shows that women experience PTSD at higher rates than men, even though men experience more traumatic events (Norris, Foster, and Weisshaar 2002). In the general population in the United States (US) women are nearly twice as likely as men to experience PTSD (Kessler et al. 1995; National Comorbidity Survey 2007) and the rate of PTSD is two to three times higher among women with AOD problems compared to men (Brown and Wolfe 1994). Although existing epidemiological research does not fully explain why women appear to be more prone to PTSD than men, it is clear that women's more frequent experience of intrusive interpersonal violence (e.g., sexual assault) offers at least a partial explanation (Breslau et al. 1999; Norris, Foster, and Weisshaar 2002; Cortina and Kubiak 2006). High rates of interpersonal violence experienced across the lifespan by women who have AOD problems (i.e., childhood and/or adulthood physical or sexual assault and intimate partner violence) suggest that the experience of victimization may be a pathway to AOD problems for women (Miller 1998; El-Bassel et al. 2000; Hedtke et al. 2008; Hien 2009). Consequently, treatment that is at least trauma-informed is indicated for women with AOD problems (Markoff et al. 2005).

The American Psychiatric Association (1994, 2000) defines PTSD as a disorder that develops after exposure to a traumatic event(s) that involved actual or threatened death or physical harm to self or others and elicited intense fear, helplessness, or horror. It is comprised of three symptom clusters: reexperiencing, avoidance, and arousal. The World Health Organization (WHO) categorizes PTSD similarly but defines the precipitating traumatic event more broadly as "exceptionally threatening or catastrophic nature which is likely to cause pervasive distress in almost anyone" (World Health Organization 2007, F43.1) and does not include the fear criterion. It has been suggested that individuals may experience subthreshold or partial PTSD in which they experience PTSD symptoms related to traumatic event (s) in their lives, but do not fully meet diagnostic criteria (Schutzwohl and Maercker 1999; Marshall et al. 2001).

The relationships between PTSD symptoms and AOD problems are complex; three different theoretical frameworks have been suggested: self-medication hypothesis, high-risk hypothesis, and susceptibility hypothesis (Chilcoat and Breslau 1998). The self-medication hypothesis proposes that people who experience PTSD symptoms use substances in order to prevent or alleviate their symptoms (Khantzian 1985; Chilcoat and Breslau 1998). Thus, AOD misuse is viewed as resulting from PTSD symptoms. In the high risk hypothesis, substance misuse is seen as a high risk behavior that is associated with other high risk behaviors (e.g., purchasing illicit drugs) that increases the risk that individuals will experience a traumatic event and lead to the development of PTSD (Chilcoat and Breslau 1998; Chilcoat and Menard 2003). In this theoretical model, the AOD problem is indirectly linked to PTSD because the individual is at increased risk for traumatic events. The susceptibility hypothesis proposes that chronic substance misuse makes individuals more susceptible to PTSD after being exposed to a traumatic event (i.e., chronic substance misuse induces a hyper-aroused state that makes the individual vulnerable to developing PTSD) (Chilcoat and Breslau 1998; Stewart et al. 1998). Thus, the substance misuse can be viewed as altering the individual in such a way that PTSD symptoms are more likely after experiences of trauma. A fourth possible explanation is that some third variable such as

genetic heritability or conduct disorder may influence the development of both AOD problems and PTSD (Chilcoat and Breslau 1998; Stewart and Conrod 2003).

Existing research consistently supports the self-medication hypothesis; for example, research indicates an overlap between the brain neurocircuits involved in drug abuse and stress responses (National Institute on Drug Abuse 2002). There appears to be a functional relationship between PTSD and AOD problems whereby substances are misused in an effort to manage PTSD symptoms. Stewart (1996) suggests that although trauma rates are high among substance misusers, PTSD symptoms, rather than the traumatic event itself, have a functional relationship with substance misuse. The functional relationship between PTSD and AOD problems may have more to do with symptom maintenance than a direct causal link. The misuse of substances could maintain the PTSD symptoms by disrupting psychological processes needed for trauma resolution. The relationship between PTSD and AOD problems may also be cyclical. Regardless of whether AOD problems or PTSD symptoms came first, once both are present they reinforce and maintain each other (Stewart, 1996; Stewart et al. 1998; Stewart and Conrod, 2003).

Empirical studies have examined the functional relationship between PTSD symptom clusters and AOD problems. In female substance misusers, Stewart and colleagues (1999) found correlations between the severity of alcohol dependence symptoms and PTSD arousal symptoms, the severity of anxiolytic and analgesic dependence and PTSD numbing and arousal symptoms and the severity of analgesic dependence and PTSD intrusion symptoms. Based upon a sample of male war veterans, associations between levels of alcohol problems and PTSD arousal and intrusion symptoms as well as between levels of drug problems and PTSD avoidance and intrusion symptoms were reported (McFall, MacKay, and Donovan 1992). Together, these two studies indicate a consistent association between the PTSD arousal symptoms and alcohol problems. The association with drug problems is less clear since Stewart et al. (1999) examined prescription anxiolytic and analgesic drugs only and McFall, MacKay, and Donovan (1992) examined drug use in general, rather than specific categories of drugs. Given that PTSD and AOD symptoms seem to maintain one another and that PTSD symptom clusters may relate to specific types of drugs differentially, the interaction between PTSD symptoms and AOD problems is important to study.

This paper focuses on the links between AOD problems and PTSD symptoms and more specifically explores the links between categories of substances being misused and specific PTSD symptoms and symptom clusters. First, we explore the types and numbers of PTSD symptoms experienced by three groups of women: (1) women with alcohol or other drug (AOD) problems during the six-months prior to the interview (current-AOD), (2) women with AOD problems in the past but no problems in the past six-months (past-AOD), and (3) women without any history of AOD problems (no-AOD). Second, we explore the types and numbers of PTSD symptoms in the current-AOD group. Third, differences in PTSD levels are examined between the AOD groups.

Method

Participants

The data used for this study was obtained from 499 mothers in western New York who participated in the first wave of a National Institute on Alcohol Abuse and Alcoholism funded longitudinal study on the relationships between mothers' alcohol involvement, mothers' punitiveness and protectiveness of their children, and their children's AOD use. The women were recruited from both outpatient treatment for AOD problems (including treatment centers, Alcoholics Anonymous, and Narcotics Anonymous) (n = 84) using fliers and posters, and from the general community of individuals residing in Western New York

(n = 415) using newspaper ads or random telephone dialing. The women who were in treatment had substantially used alcohol and possibly drugs in the past six-months. Some women from the general community were recruited on the basis of having current and substantial alcohol problems but no treatment in the past year (n = 175). Others were recruited on the basis of having little or no drinking and no recent AOD treatment (n = 240). It was possible for the women from the community who had substantial alcohol problems to have recently used drugs and for those with little or no alcohol use to have used alcohol or drugs in the past. Having at least one child between the ages of ten and sixteen who would also participate in the study was an eligibility requirement. For the purposes of the current analyses only the data from the adult participants was utilized. Additionally, all of the adult participants were treated as a single sample and AOD groups were created based on substance use patterns reported on study measures and not on the basis of the purposive sampling used in the original study.

The sample consisted of 499 mothers who had a mean age of 39 (sd. = 5.79), a mean income of \$15,648 (sd. = 13,104), and a mean of 13.20 (sd. = 2.14) years of education. They were predominately either single (34%) or married (38%). Ten percent were separated, 17% were divorced, and 0.8% were widowed. In terms of ethnicity, 46% were black, 41% were white, and 14% were other; (Native American, Hispanic, and mixed ethnicity).

Procedures

The data were obtained in face-to-face interviews that lasted one and one-half to two hours. Mothers and children were interviewed separately and both were compensated for their time. The women were screened for alcohol or drug intoxication before beginning the interview; those that were intoxicated were not interviewed that day (they could reschedule for another interview date). Informed consent was obtained from all participants and all procedures were approved by the Institutional Review Board at the University at Buffalo.

Measures

Alcohol Problems—Alcohol problems were assessed using items from the Diagnostic Interview Schedule (DIS) (Robins et al. 1996). Using the DIS items, participants were asked about their experience of alcohol abuse and alcohol dependence symptoms (based on *DSM-IV* criteria) both in their lifetime and over the past six-months. Positive responses to alcohol abuse and alcohol dependence items were summed to create an alcohol abuse and an alcohol dependence symptom count variable for both the six-months prior to the interview and the lifetime. The *DSM-IV* (American Psychiatric Association 1994) criteria for abuse and dependence were utilized to determine if an alcohol problem was present. If the participant had an alcohol abuse symptom or three alcohol dependence symptoms in their lifetime or past six-months, they were categorized as having an alcohol problem in their lifetime or past six-months respectively. This information was used to create an alcohol variable categorized into three levels: 1) no alcohol problems, 2) alcohol problems in the past (problems in the past but not in the last six-months), and 3) current alcohol problems (problems in the past six-months).

Drug Problems—Drug problems for the lifetime and past six-months were assessed using items from the National Household Survey on Drug Abuse (National Institute on Drug Abuse 1995). Using these items, data were gathered on both the prevalence and frequency of non-medical drug use for the following drugs: marijuana, cocaine, heroin, hallucinogens, inhalants, analgesics, tranquilizers, stimulants, sedatives, and anabolic steroids. First, patterns of drug use were examined based on the participants' report of lifetime and past six-month use of these specific drugs. In the next step, we calculated problematic use/misuse with the number of days that participants reported using in their lifetime and past six-

months. The number of days denoted more than incidental use of non-medical drugs; if participants reported using a drug (other than marijuana) more than 12 days in their lifetime, they were considered to have lifetime misuse of that drug category. For marijuana, the inclusion criterion was more than 100 days of use in the lifetime. Six or more days of use in the past six-months for all drugs (except marijuana) were considered positive criteria for drug misuse. For marijuana, the six-month inclusion criterion was 13 or more days of use. The number of drugs misused in the lifetime was summed to create a lifetime total drug problem variable and the number of drugs misused in the past six-months was summed to create a six-month total drug problem variable. These drug total variables were used to create three drug problem groups: 1) no drug problems, 2) past drug problems (problems in the past, but not in the last six-months), and 3) current drug problems (problems in the past six-months).

Alcohol and Other Drug Groups—The alcohol and drug groups were combined into a composite AOD variable comprised of three new groups (no-AOD, past-AOD, and current-AOD) to be used in the analyses for the study as follows: 1) Individuals who had no history of alcohol or other drug problems were placed in the no-AOD group; 2) those who had a past history of problems with either alcohol or other drugs were placed in the past-AOD group; and 3) those who had alcohol or other drug problems in the past six-months were placed in the current-AOD group. This current-AOD group was further sub-divided into alcohol, marijuana, and cocaine problem groups to create a separate variable for analyses comparing only these groups. Members of the alcohol group could not have used marijuana or cocaine; members of the marijuana group may have used alcohol or drugs other than cocaine; and members of the cocaine group may have used alcohol, marijuana, or other drugs.

To compare the current-AOD subgroups, past-AOD group, and no-AOD group on levels of PTSD, a five-level variable was created. This five-level variable consisted of the no-AOD, past-AOD, alcohol, marijuana, and cocaine groups. Alcohol was selected for study because it is widely misused, is known to be associated with PTSD symptoms, and was well represented in our sample. Marijuana and cocaine were selected because data exploration showed that they were the most frequently reported drugs used in our sample. The other drugs were used to a much lesser extent and primarily in some combination with marijuana or cocaine.

Post-Traumatic Stress—Post-traumatic stress was measured using a series of 17 questions adapted from the Structured Clinical Interview (SCID) for the *Diagnostic and Statistical Manual, third edition (DSM III-R)* (Spitzer, Williams, Gibbon, and First 1989) and criteria from the *DSM-IV* (American Psychiatric Association 1994). These questions determined if the participant experienced each PTSD symptom listed in the DSM-IV in the past six-months. Both the total number of PTSD symptoms and the number of symptoms for each cluster (reexperiencing, avoidance, and arousal) over the past six-months were summed and used in the analyses.

Results

Sample Characteristics

Alcohol and Other Drug Problems—In terms of AOD problems, 29% of the participants had no-AOD problems, 36% had AOD problems in the past. Of the 31% who had current-AOD problems, 16% had alcohol problems, 7% had marijuana problems, and 8% had cocaine problems.

PTSD Symptoms—Overall, 63% of the participants experienced some PTSD symptoms. Approximately one-third of the participants experienced no symptoms, one-third experienced 1–5 symptoms, and another one-third experienced 6–17 symptoms. The average number of symptoms experienced was four.

Main Findings

Substance Misuse and PTSD Symptoms—The association between AOD groups (no-AOD, past-AOD, current-AOD) and PTSD symptoms and the percentage of women reporting each type of PTSD symptom in the past six-months is presented separately by symptom cluster in Table 1. Cramer's V coefficients reveal small, but highly significant associations between PTSD symptoms and AOD problems. Women in the current-AOD group reported the highest percentage of PTSD symptoms for all symptoms. Also, a higher percentage of those who were in the past-AOD group experienced all but two of the PTSD symptoms (dreams and feeling detached/estranged) compared to the no-AOD group.

Current AOD and PTSD Symptoms—In order to explore the type of current AOD misuse and PTSD symptoms three subgroups were formed from the current-AOD group: alcohol misuse ($n=78$), marijuana misuse ($n=34$), and cocaine misuse ($n=40$). A crosstabulation using Cramer's V coefficient was conducted to examine the association between types of substance misused among the current-AOD group and specific PTSD symptoms (see Table 2). A small association between AOD categories and the irritability/anger outbursts PTSD symptom was found (Cramer's $V = .22, p = .02$). Given the number of tests used to examine the association between the AOD use groups and PTSD symptoms and the alpha level of .05, the likelihood of at least one significant finding due to chance is high and therefore should be interpreted cautiously. A review of Table 2 reveals that a substantially larger percentage (ten or more percentage points) of the cocaine group experienced the following symptoms: physiologic reactivity, irritability/anger outbursts, and trouble concentrating than either the alcohol or marijuana group. A substantially larger percentage of the cocaine group also experienced the PTSD symptoms of feeling detached/estranged and loss of interest in important things compared to the marijuana group.

AOD Groups and PTSD Symptom Clusters—The no-AOD, past-AOD, and current-AOD subgroups (alcohol, marijuana, and cocaine) were used to explore the relationship between the level of PTSD symptoms and AOD groups. One-way ANOVA analyses with post hoc tests were conducted to test the differences between these five groups on total number of PTSD symptoms as well as on the PTSD symptom clusters. (Although the five AOD groups did differ on several demographic characteristics, using either ANCOVA or multiple regression [MR] to adjust for covariate differences was not done. Miller and Chapman (2001) have forcefully argued that when covariates are associated with the independent variable, both ANOVA and MR yield an incorrect test of the independent variable's association with the dependent variable, here PTSD.) The findings revealed that there were significant differences between the groups on the total number of PTSD symptoms ($F(4, 471) = 14.71, p < .001$) and all three PTSD symptom clusters: reexperiencing ($F(4, 471) = 9.79, p < .001$), avoidance ($F(4, 469) = 10.53, p < .001$), and arousal ($F(4, 470) = 17.29, p < .001$) (see Table 3).

Due to significant Levene's tests indicating unequal variances, Dunnett's T_3 was used in the post hoc tests. The post hoc tests show that both the alcohol group and the cocaine group differed from the no-AOD and past-AOD groups on the total number of PTSD symptoms and the PTSD symptom clusters (reexperiencing, avoidance, and arousal). The marijuana group differed from the no-AOD group on total PTSD symptoms and the avoidance and arousal clusters, but not on the reexperiencing symptom cluster. On the reexperiencing

cluster, there was trend level significance for the marijuana group compared to the no-AOD group ($p = .06$). The marijuana group differed from the past-AOD group on the arousal symptom cluster only. It did not differ from the past-AOD group on total PTSD symptoms or the reexperiencing and avoidance symptom clusters. Additionally, there was trend level significance for the marijuana group vs. the past-AOD group on PTSD total symptoms ($p = .06$). These findings suggest that the differences found on PTSD symptoms are between the no-AOD group and the current-AOD subgroups and the past-AOD group and current-AOD sub-groups rather than between the current-AOD sub-groups.

Discussion

The exploration of the relationship between PTSD symptoms and AOD problems in women who were currently misusing, had misused in the past, or had no misuse history revealed that a larger percentage of those who were currently misusing alcohol or other drugs experienced each PTSD symptom. To a lesser degree, a larger percentage of the past-AOD group experienced all but two PTSD symptoms. Each PTSD symptom showed a significant association with AOD problems. These findings are congruent with existing research showing a relationship between PTSD and AOD problems.

The analysis of PTSD symptoms in relation to specific categories of current drug misuse showed that cocaine misuse may be associated with the irritability and outbursts symptom. Although this finding should be interpreted cautiously, it suggests that individuals who misuse cocaine may require specific interventions to help manage their irritability. Also, a substantially higher percentage of the cocaine group experienced the PTSD symptoms of trouble concentrating and physiologic reactivity than the alcohol or marijuana groups. A substantially higher percentage of the cocaine group experienced the symptoms of feeling detached/estranged and loss of interest in important things than the marijuana group as well. The cocaine misusers' experience of these symptoms may be due to the long-term pharmaceutical effects of the drug or withdrawal symptoms, or an interaction of pharmacological effects with PTSD-related neurobiological changes (Dansky 1998). It is possible that there is something unique about cocaine misusers and their experience of these PTSD symptoms. Additional research on the relationship between cocaine misuse and specific PTSD symptoms is needed to clarify the specific needs of those who misuse cocaine. In the mean time, a general assessment on traumatic experiences and associated PTSD symptoms is warranted.

These findings suggest that misusing substances in general (rather than alcohol, marijuana, or cocaine alone or in combination with other drugs) is associated with experiencing greater PTSD symptom levels overall, as well as for each symptom cluster. However, there were some differences in the patterns observed beyond those already noted for cocaine. When compared to those who had never had AOD problems or those who had AOD problems in the past, women who were currently misusing alcohol or cocaine experienced significantly more PTSD symptoms overall and on each PTSD symptom cluster. Marijuana misusers were less likely to show these same patterns of differences. Specifically, they had significantly more PTSD symptoms overall and on the avoidance and arousal clusters than those with no-AOD problems, but only had significantly more PTSD arousal symptoms than those with past-AOD problems. They did not differ from the no-AOD group on the PTSD reexperiencing cluster of symptoms and they did not differ from the past-AOD group on the total PTSD symptoms or the reexperiencing and avoidance clusters. However, an analysis of effect sizes for the non-significant marijuana comparisons shows that the marijuana group and the alcohol group both have moderately strong effect sizes that are very close numerically (for example, .64 and .61 respectively on total PTSD symptoms when comparing current and past misuse groups). Combined with the small sample size for the

marijuana group ($n = 34$) the effect sizes suggest that the failure to find differences in the marijuana group as described above was a function of inadequate statistical power.

Taken together, the findings suggest that regardless of the type of substance being misused (alcohol, marijuana, cocaine), those who had no history of AOD problems and those that had not misused over the past six-months experienced fewer PTSD symptoms than those who were currently misusing. Also, those who had misused substances in the past experienced more PTSD symptoms than those who had no lifetime history of substance misuse. It is possible that substance misuse maintains, or exacerbates, PTSD symptoms, which would suggest that cessation from substance use would ameliorate PTSD symptoms. However, a second possible explanation is that those who were currently misusing substances had higher levels of PTSD and were unable to cease use. Given that other research has demonstrated that some people continue to experience PTSD symptoms after being substance free for six-months and that these symptoms contribute to relapse (Brown 2000; Brown, Stout, and Mueller 1996), it appears that PTSD symptoms are an important consideration in treatment for individuals who have AOD problems.

Implications for Social Work Practice

Practitioners who work with clients who have AOD problems or PTSD should assess their clients for both PTSD symptoms and AOD problems and develop treatment plans to address both problems with direct interventions or appropriate referrals when co-occurring problems are identified (see Najavits 2002; Ouimette and Brown 2003; Briere and Scott 2006; Foa et al. 2009; Alcohol and Drug Abuse Institute 2010). Despite the mounting evidence that supports the need for practitioners and treatment programs to address or at least assess for comorbid PTSD and AOD problems, the practice of dual assessments is far from universal. The lack of resources and expertise at the practitioner and agency level as well as limitations created by the health services structure may account for this (Wiechelt et al. 2005).

Practitioners in AOD treatment settings recognize that their clients have been exposed to trauma, however many lack specific training in assessment and treatment for the effects of trauma exposure. Practitioners in mental health settings often lack knowledge and skill in how to assess clients for AOD problems. Practitioner groups are frequently at odds with one another over if, when, and how each disorder should be addressed. Mental health practitioners tend to see the trauma and PTSD as the primary problem and practitioners in AOD treatment settings see AOD problems as primary. Cross-training on PTSD and AOD problems is needed for practitioners in both AOD and mental health treatment settings to enhance practitioners' ability to identify PTSD and AOD problems in their clients and provide appropriate interventions or referrals. Agencies need to develop policies and procedures that allow practitioners to address PTSD and AOD problems such as, allotting more time for assessment interviews, developing treatment components within their agencies that address PTSD and AOD problems together, or developing referral processes to agencies or practitioners that have the capability to address both problems. The policy and structure of the health service delivery system and payment systems encourages bifurcation in the delivery of AOD and mental health services. The delivery system's capacity for treating comorbid PTSD and AOD problems could be enhanced by implementing policy that encourages agencies and practitioners to address both disorders. Such policy could include stipulations in licensing requirements, operating regulations, and managed care review guidelines that allow practitioners in AOD and mental health treatment settings to address AOD problems and PTSD simultaneously by either developing integrated programs or collaborating with one another to deliver treatment.

Recognizing that trauma is a contributing factor in the development of mental health and AOD problems, the Substance Abuse and Mental Health Services Administration is

advocating for all treatment providers to implement trauma-informed care (see National Center for Trauma-informed Care 2010). Trauma-informed care is not trauma-specific treatment per se, but rather incorporates trauma sensitive practices in every aspect of the treatment program. This means that the program operates on an empowerment model that facilitates recovery by respecting choice, equalizing power, emphasizing strengths, building skills rather than managing symptoms, and utilizing relational collaboration. In order to provide trauma-informed care, administrators must be committed to providing training and support to staff for working with trauma survivors, providing resources for universal screening, doing away with policies or procedures that have the potential to revictimize service recipients and replacing them with new policies and procedures that maximize the potential for recovery (Moses et al. 2003).

In terms of trauma-specific care for those with concomitant PTSD symptoms and AOD problems three treatment formats have been identified: 1) sequential (treatment for one disorder precedes treatment for the other); 2) parallel (the treatment for both disorders occurs simultaneously, but is administered by different practitioners or programs); or 3) integrated (treatment for both disorders is given simultaneously by the same practitioner or program) (Najavits 2003). Several treatment protocols have been developed with varying levels of empirical support for reducing symptoms, for example *Concurrent Treatment of PTSD and Cocaine Dependence* (Back et al. 2001), *Seeking Safety*, (Najavits 2002), *Substance Dependence PTSD Therapy* (Triffleman, Carroll, and Kellogg 1999), *Trauma Recovery and Empowerment* (Fallot and Harris 2002).

Despite the clear need for trauma-informed and trauma-specific care, it will take time for delivery systems and agencies to accept and implement such care. In the meantime, practitioners can identify effective interventions that can be used with the people that they work with. Several interventions that practitioners could draw from are currently in use. For example, motivational interviewing (Miller and Rollnick 2002) can be used to help individuals to recognize that their substance misuse is linked to their emotional distress which may move them to a higher level of readiness to change. A functional behavioral analysis can be used to raise the individual's awareness of the links between traumatic experiences and substance use behaviors (Coffey, Dansky, and Brady 2003). A brief intervention developed by Conrod, et al. (2000) which utilizes both motivational and coping skill strategies and has been shown to be effective with women who have AOD problems could be implemented. In any event, this study and other research clearly shows that PTSD symptoms and AOD problems are linked; consequently, practitioners need to attend to the complex interrelatedness of these problems when they work with their clients.

Implications for Research

This study needs to be replicated with a more diverse sample from a broader geographic area to determine if people from different backgrounds or geographic regions differ on their experience of PTSD symptoms and AOD problems. Also, a larger sample with higher numbers of people in each drug use category would increase statistical power and strengthen internal validity. A larger sample may shed more light on how drugs selected for misuse are related to PTSD symptoms. Future research should consider the possible physiologic effects of certain drugs in relation to PTSD. In general, more research that recognizes the complex nature of trauma and its association with AOD problems is needed.

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Table 1

Cross-tabulation of Past Six-Month PTSD Symptoms and AOD

PTSD Symptom	No AOD n = 144	Past AOD n = 180	Current AOD n = 152	Cramer's V
<u>Re-experience Type</u>				
1. Unwanted memories	25%	32%	59%	.30***
2. Dreams	19%	15%	32%	.17***
3. Flashbacks	15%	18%	29%	.15**
4. Mood changes with reminder	14%	20%	37%	.22***
5. Physiological reactivity	11%	17%	30%	.20***
<u>Avoidance Type</u>				
1. Avoid thinking about the experience	22%	29%	50%	.25***
2. Avoid reminders	20%	27%	42%	.19***
3. Trouble remembering	4%	10%	18%	.18***
4. Loss of interest in important things	13%	16%	31%	.20***
5. Feeling detached/estranged	15%	15%	36%	.24***
6. Emotional numbing	9%	10%	22%	.16**
7. Change in thinking about the future	29%	34%	47%	.16**
<u>Arousal Type</u>				
1. Trouble sleeping	19%	25%	46%	.25***
2. Irritability/anger outbursts	12%	17%	40%	.28***
3. Trouble concentrating	14%	17%	38%	.25***
4. Hyper-vigilant	17%	29%	51%	.29***
5. Hyper-startle	12%	18%	38%	.26***

Note.

*
 $p < .05$,**
 $p < .01$, .***
 $p < .001$.

Table 2

Cross tabulation of Past Six-Month PTSD Symptoms and Current-AOD

PTSD Symptom	Alcohol <i>n</i> = 78	Marijuana <i>n</i> = 34	Cocaine <i>n</i> = 40	Cramer's V
<u>Re-experience Type</u>				
1. Unwanted memories	58%	56%	63%	.05
2. Dreams	31%	29%	35%	.05
3. Flashbacks	30%	24%	31%	.06
4. Mood changes with reminder	37%	38%	35%	.02
5. Physiological reactivity	27%	27%	40%	.13
<u>Avoidance Type</u>				
1. Avoid thinking about the experience	50%	50%	50%	0.0
2. Avoid reminders	44%	38%	43%	.04
3. Trouble remembering	17%	24%	15%	.08
4. Loss of interest in important things	30%	27%	38%	.09
5. Feeling detached/estranged	36%	29%	40%	.08
6. Emotional numbing	22%	24%	18%	.05
7. Change in thinking about future	47%	50%	45%	.04
<u>Arousal Type</u>				
1. Trouble sleeping	44%	53%	45%	.08
2. Irritability/anger outbursts	32%	35%	58%	.22*
3. Trouble concentrating	35%	35%	48%	.12
4. Hyper-vigilant	50%	50%	53%	.02
5. Hyper-startle	36%	38%	40%	.04

Note.

*
 $p < .05$

Table 3

Mean Number of PTSD Symptoms by Misuse Category

PTSD Symptom Measures	No AOD (n=144)	Past AOD (n=180)	Alcohol (n=78)	Marijuana (n=34)	Cocaine (n=40)	F	Post Hoc
<u>Total Symptoms</u>	M 2.68 SD (3.96)	3.46 (4.19)	6.23 (5.24)	6.26 (5.37)	6.93 (5.32)	14.71 ***	0< 2,3,4; 1<2,4
<u>Re-experiencing Symptoms</u>	M .83 SD (1.38)	1.01 (1.46)	1.82 (1.80)	1.74 (1.71)	2.03 (1.78)	9.79 ***	0,1<2,4
<u>Avoidance Symptoms</u>	M 1.10 SD (1.64)	1.39 (1.82)	2.45 (2.21)	2.41 (2.27)	2.48 (2.20)	10.53 ***	0<2,3,4; 1<2,4
<u>Arousal Symptoms</u>	M .73 SD (1.32)	1.06 (1.44)	1.96 (1.81)	2.12 (1.92)	2.43 (1.82)	17.29 ***	0,1<2,3,4

Note.

*** $p < .001$. Post hoc tests significant at $p < .05$. Post hoc groups are 0 = no-AOD, 1 = past-AOD, 2 = alcohol misuse, 3 = marijuana misuse, 4 = cocaine misuse.