Relationships Between Trauma, Posttraumatic Stress Disorder Symptoms, Dissociative Symptoms, and Lifetime Heroin Use Among Individuals Who Abuse Substances in Residential Treatment

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This study explored the relationships between trauma, posttraumatic stress disorder symptoms, dissociation, and lifetime heroin use among inpatient clients who abused substances. Results indicate important implications for practice and directions for future research.

Heroin addiction is a condition that is characterized by persistent use and chronic relapse, as well as by the development of severe negative consequences that include high rates of premature mortality and morbidity (Hser, Chou, & Anglin, 2007); increased involvement in criminal behavior (Hser, Hoffman, Grella, & Douglas, 2001); increased probability of suicidal behaviors (Kalyoncu, Mirsal, Pektas, & Beyazyurek, 2007); and higher rates of risky sexual behavior and reported sexually transmitted diseases, including HIV (Raj, Saitz, Cheng, Winter, & Samet, 2007). Research has indicated that current heroin dependence is related both to exposure to traumatic events and to the trauma-related symptomatology associated with posttraumatic stress disorder (PTSD; e.g., Mills, Lynskey, Teeson, Ross, & Darke, 2005; Somer & Avni, 2003). Nonetheless, a review of the literature revealed that there were (a) limited empirical efforts devoted to examining factors that might be related to the use of this drug and (b) no studies that included participants who reported using heroin at some point in their lives but who were not classified with an abuse or dependence diagnosis. Sareen, Chartier, Paulus, and Stein (2006) noted that results of studies based on lifetime drug use, rather than use that meets criteria for a dependence diagnosis, might have more reliability for two primary reasons. First, they suggested that clients are more likely to remember and report some use than they are to remember and report the levels of use necessary for a substance use diagnosis

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as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000). Second, the authors noted when individuals who abuse substances underreport their frequency and extent of use, the reliability of a dependence diagnosis is often compromised.

As a result, the current study was designed to add to the sparse literature concerning lifetime heroin use. Following a brief review of the literature related to correlates of heroin abuse, this study explores the relationships between lifetime heroin use and exposure to trauma, levels of PTSD symptoms, and levels of dissociative symptoms using a convenience sample of individuals who abuse substances attending inpatient treatment. Treatment implications and suggestions for additional research are provided.

Literature Review

Heroin use has been shown to be associated with exposure to trauma and with the development of PTSD and dissociative symptoms. A review of the literature concerning the relationships between these factors and heroin use is discussed in the following sections.

Trauma and PTSD Symptoms

Exposure to trauma is a common phenomenon among individuals who abuse heroin. For example, Clark, Masson, Delucchi, Hall, and Sees (2001) found that 72% of individuals who abuse heroin in methadone maintenance treatment reported having been exposed to trauma. Other research has reported a 92% trauma exposure rate among individuals who abuse heroin, as well as a 41% lifetime PTSD rate, noting that this PTSD rate was considerably higher than the 8% rate found by Kessler et al. (1997) in a sample of the general population (Mills et al., 2005). Because exposure to trauma and the development of PTSD symptoms seem to be relatively common among persons who abuse heroin, we decided to compare individuals who have used heroin over their lifetime with individuals who have never used heroin to determine whether the number of traumatic events and/or level of PTSD symptoms reported by the groups would differ.

Dissociative Symptoms

Dissociation is a common symptom in PTSD, present in 82% of persons who abuse substances with current PTSD and in 52% of those with lifetime PTSD (Van der Kolk et al., 1996). A few studies have found positive associations between trauma, substance dependency, and dissociative symptoms (Dunn, Paolo, Ryan, & Van Fleet, 1993; Roesler & Dafler, 1993; Somer, Dolgin, & Saadon, 2001). Furthermore, higher levels of dissociation are also positively associated with exposure to multiple traumas (Banyard, Williams, & Siegel, 2001). Somer and Avni (2003) suggested that the use of heroin by trauma survivors may represent an attempt to reduce the effects of trauma when psychological dissociation has failed to do so, a phenomenon they call "chemical dissociation" (p. 27). That is, their research suggests that when individuals who use heroin are unable to sufficiently reduce the discomfort associated with their trauma through psychological dissociation, they may resort to using the heroin to obtain relief.

Comparison of persons who have used heroin over their lifetime with persons who have never used heroin on their exposure to multiple traumatic events, levels of PTSD symptoms, and levels of dissociative symptoms is important because PTSD has been shown to be related to poorer treatment adherence (Hien, Cohen, & Campbell, 2005), whereas higher levels of dissociative symptoms have been shown to be related to greater psychological distress and shorter duration of treatment (Somer & Avni, 2003) among individuals with heroin dependence. It is unknown at this time if only current heroin dependence is associated with these factors or if the use of heroin at any point in a person's life is a risk factor for comorbid PTSD symptomatology and dissociation. This research could enhance the understanding of factors associated with heroin use and thus improve prevention and intervention efforts.

On the basis of the current literature discussed earlier, the hypotheses for this study were as follows: (a) there is a positive relationship between the number of experienced or witnessed traumatic events and lifetime heroin use; (b) there is a positive relationship between the number of experienced or witnessed traumatic events and levels of PTSD symptoms; (c) there is a positive relationship between levels of PTSD symptoms and lifetime heroin use; and (d) there is a positive relationship between levels of dissociative symptoms and lifetime heroin use. Age, gender, race, and ethnicity were included as control variables.

Method

Participants

On receiving institutional review board approval, we administered a packet of survey instruments to a convenience sample of geographically and economically diverse participants (N = 160). In this cross-sectional design, data were gathered from this convenience sample on a single day at a private inpatient substance abuse treatment agency located in the southeastern United States. Clients were asked to voluntarily participate in the study after having received the informed consent forms and a packet with the study questionnaires. To participate in the study, clients had to be 18 years or older, enrolled at the treatment agency, and able to speak English. No clients refused to participate. Nevertheless, questionnaires completed by 17 of the participants contained missing data and were therefore excluded from the analysis. This resulted in a final sample size of 143. Of the participants, 75% (n = 107) reported never having used heroin, whereas 25% (n = 36) reported having used heroin at some point in their lives. The mean

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age for the overall sample was 38.57 years (range = 18-67, SD = 11.31). Approximately 68% (n = 97) of the participants were male. Approximately 54% (n = 77) of the participants self-reported as European American, and 82% (n = 117) were Caucasian.

Measures

Dissociative symptoms. The Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) was used to assess levels of dissociative symptoms. The DES is a 28-item self-report scale that asks about participants' experiences of amnesia, depersonalization, derealization, absorption, and imaginative involvement (excluding experiences while under the influence of alcohol or drugs). The scale contains a visual analogue for each item that provides the percentage of the time that the participant has experienced the symptom, ranging from 0% (this never happens to you) to 100% (this always happens to you). A total score is calculated by adding the indicated percentages and then dividing by 28. The DES has demonstrated good to excellent concurrent and criterion-related validity (Carlson & Putnam, 1993; Frischolz et al., 1990; Steinberg, Rounsaville, & Cicchetti, 1991). Furthermore, Frischolz et al. and Bernstein and Putnam reported test-retest and internal consistency reliability scores of .96 and .83, respectively. The DES has been used in almost all the studies discussed in the aforementioned literature review assessing levels of dissociative symptoms in substance-abusing populations (Dunn et al., 1993; Dunn, Ryan, & Dunn, 1994; Dunn, Ryan, Paolo, & Van Fleet, 1995; Ellason, Ross, Sainton, & Mayran, 1996), as well as in individuals who use heroin specifically (Somer & Avni, 2003).

PTSD symptoms. The PTSD Checklist (PCL; Weathers, Litz, Huska, & Keane, 1994) was used to assess symptoms of PTSD. This self-report instrument measures the 17 symptoms of PTSD contained in the *DSM-IV-TR* (APA, 2000). The PCL subscales parallel the reexperiencing (Diagnostic Criteria B; PCL-B), avoidance/numbing (Diagnostic Criteria C; PCL-C), and hyper-arousal (Diagnostic Criteria D; PCL-D) symptoms for PTSD found in the *DSM-IV-TR*. Its excellent internal consistency (.94) and test–retest reliability (.88) for a 1-week period have been demonstrated (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Ruggiero, Del Ben, Scott, & Rabalais, 2003). In addition, the scale sensitivity and specificity in identifying PTSD ranges from .78 to .94 and from .83 to .86, respectively, with significant convergent validity against established PTSD instruments, including the Clinician-Administered PTSD Scale (Blanchard et al., 1996; Ruggiero et al., 2003; Weathers et al., 1994).

The PTSD Checklist–Stressor Specific Version (PCL-S) was used in this study to assess symptoms of PTSD. This version of the PCL questions respondents concerning problems related to an identified stressful experience. Using a 5point Likert scale ranging from 1 (*not at all*) to 5 (*extremely*), participants report to what degree the problem bothered them in the past 30 days. A total score is obtained by summing the scores from each of the 17 items, resulting in total scores ranging between 17 and 85. The scale has shown a sensitivity of .97, a specificity of .87, and an overall diagnostic efficacy of .94 when a cutoff point of 44, as recommended by Blanchard et al. (1996), is used.

Traumatic life events. The Life Events Checklist (LEC; Gray, Litz, Hsu, & Lombardo, 2004) was used to evaluate participants' experience of multiple traumatic events. The LEC is a self-report instrument that asks participants about 16 different potentially traumatic events that may result in PTSD, such as natural disasters, fires and explosions, transportation accidents, life-threatening illnesses or injuries, and sexual assaults. Participants rate their experience of each event on a 5-point nominal scale containing possible responses of 1 = happened to me, 2 = witnessed it, 3 = learned about it, 4 = notsure, and 5 = does not apply. For the purposes of this study, the number of responses from the "happened to me" and "witnessed it" categories were extracted for each participant and added together to compute a total LEC score. Although we are unaware of any studies that have combined the categories in this manner, the LEC in its original form has demonstrated adequate to excellent psychometric properties in both clinical and nonclinical samples. Gray et al. reported that the LEC has stable test-retest reliability with a retest correlation of .82 (p < .001) and a mean kappa for all items of .61. In addition, the LEC showed a high convergent validity with the Traumatic Life Events Questionnaire (Kubany et al., 2000), with a total score correlation of -.55 (p < .001).

Heroin use. The intent of this exploratory study was to determine whether participants' lifetime use of heroin would be positively related to trauma exposure, PTSD symptoms, and/or dissociative symptoms; it was not to demonstrate the severity of use or proximity to the trauma. Given that there are no existing studies concerning the relationship between these variables and lifetime use, it was our hope that this study would help set the stage for future research. If significant results evolve, the study will be replicated with a larger sample that will support more variables. Therefore, participants were asked simply whether they had ever used heroin during their lifetime. Possible responses were either "yes" or "no."

Data Analysis

Bivariate correlation analyses were conducted to determine correlations between the demographic variables; the DES, the PCL-S, and the LEC; and the heroin use variable. Independent samples *t* tests and chi-square analyses were conducted to determine whether there were statistically significant differences between the means of those who reported having used heroin and those who denied use on the demographic variables and on the DES, total PCL-S, and LEC scores. Last, a discriminant function analysis was conducted to assess the ability of the DES, total PCL-S, and LEC scores to discriminate among individuals who had a history of lifetime heroin use and those who reported never having used heroin. The number of participants in some analyses varied because of missing data.

Results

Results of chi-square and *t*-test analyses comparing the two groups in terms of the demographic variables indicated no statistically significant differences between the heroin use and nonuse groups regarding age, gender, race, or ethnicity.

Correlational Analyses

A Pearson's *r* correlation matrix including the DES, total PCL-S, and LEC scores was generated to assess the magnitude of the relationships between these variables. A moderate correlation was found between the DES and total PCL-S scores (r = .37, p < .01). Nevertheless, no significant correlations were found between the LEC and either the PCL-S or the DES.

Comparisons of Means

Results of chi-square and t-test analyses comparing those who reported having used heroin with those who denied use indicated no statistically significant differences in any of the demographic variables (i.e., age, gender, race, and ethnicity). Table 1 presents the means and standard deviations for the number of traumatic events experienced or witnessed, the PTSD symptom clusters, total PTSD symptoms, and the dissociative symptoms. There were no statistically significant differences in the number of traumatic events experienced or witnessed, PCL-B (reexperiencing) or PCL-D (hyperarousal) scores, or total PCL-S scores. There were, however, significant differences between the heroin use and nonuse groups, t(125) = -2.08, p < -2.08.05, in levels of PCL-C (avoidance/numbing) symptoms, with participants who had used heroin over their lifetime (M = 18.88, SD = 7.38) reporting higher levels of avoidance/numbing symptoms than did participants who had never used heroin (M = 15.92, SD = 6.83). Furthermore, there were statistically significant differences, t(126) = -2.76, p < .01, between the groups in levels of dissociative symptoms, with participants who had used heroin

TABLE 1

Means and Standard Deviations for Lifetime Traumat	ic Events,
Posttraumatic Stress Disorder (PTSD) Symptom C	lusters,
Total PCL-S Scores, and Dissociative Sympto	ms

Variable	Heroin Use Group		Nonuse Group		
	M	SD	M	SD	
Lifetime traumatic events	5.91	2.90	5.34	3.02	
PTSD reexperiencing	11.90	5.83	10.80	4.59	
PTSD avoidance/numbing**	18.88	7.38	15.92	6.83	
PTSD hyperarousal	13.50	5.41	11.78	4.73	
Total PCL-S score	43.67	16.20	38.07	14.33	
Dissociative symptoms*	19.89	13.32	13.18	11.24	

Note. PCL-S = PTSD Checklist–Stressor Specific Version. *p < .05. **p < .01. over their lifetime (M = 19.89, SD = 13.32) reporting higher levels than did participants who had never used heroin (M = 13.18, SD = 11.24).

A box plot of the DES scores revealed that individuals who reported never having used heroin scored lower in dissociation symptoms than did those individuals who had used heroin over their lifetime (see Figure 1). Of particular note is the fact that the means for each group are lower than the cutoff score of 30 used to screen for clinical levels of dissociation (Carlson & Putnam, 1993). Both groups contained outliers who scored above the cutoff score. The outliers in the heroin use group, however, were more extreme than those in the nonuse group.

Discriminant Analysis

A two-group stepwise discriminant function analysis was conducted to assess whether the DES, total PCL-S, and LEC scores could discriminate among individuals who had a history of lifetime heroin use and those who reported never having used heroin. Box's *M* statistic revealed that the homogeneity of covariance assumption was not violated: Box's *M* = 2.21, *F*(1, 13715) = 2.17, *p* > .05. The discriminant function analysis yielded an index of discrimination, Wilks's λ = .92, *F*(1, 107) = 9.17, *p* < .01, with only





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the DES included for the group classifications. The standardized canonical discriminant function coefficient for the DES was .28. The overall hit rate of correct group classification was greater than 68%. Classification was cross-validated by a leave-one-out method. Cohen's kappa, a measure of the improvement of the classification over chance (Fleiss, 1981), was computed (k = .21, SE = .09), and a *z*-score transformation indicated that the classification was significantly greater than the classification expected by chance (z = 2.36, p < .05).

Discussion

The purpose of this study was to explore the relationships between three factors reported by inpatient clients who abused substances-number of lifetime traumatic events, level of PTSD symptoms, and level of dissociative symptoms-and lifetime use of heroin. Our analyses produced two unexpected findings. First, we had expected that the number of lifetime traumatic events experienced or witnessed would be positively related to levels of both PTSD and dissociative symptoms and to lifetime heroin use. Nonetheless, LEC scores were not related to either PTSD or dissociative symptoms or to lifetime heroin use. These findings were contrary to previous research that has reported a positive association between multiple traumas and both PTSD symptoms (Banyard et al., 2001; Kubiak 2005; Perkonigg, Kessler, Storz, & Wittchen, 2000) and levels of dissociation (Banyard et al., 2001). A possible explanation for these unexpected results may lie in the instrument used to assess lifetime traumatic events. The LEC asks questions about 17 discrete events but makes no effort to cluster or weigh the events in any way. Therefore, it may be that different types or combinations of trauma may be related more closely to heroin use than others. Future research in this area should use an instrument that could tease out these relationships more clearly.

Second, because previous research has clearly linked trauma and PTSD to substance abuse and dependency (Back et al., 2000; Brady, Killeen, Saladin, Dansky, & Becker, 1994; Dansky, Saladin, Brady, Kilpatrick, & Resnick, 1995; Edwards, Dunham, Ries, & Barnett, 2006), it was expected that higher levels of PTSD symptoms would be associated with lifetime heroin use. Nevertheless, only scores of the symptoms contained in the PCL-S Avoidance/Numbing subscale were related to lifetime heroin use in this sample. Reexperiencing and hyperarousal symptom cluster scores and total PCL-S scores were not related to lifetime heroin use. This finding is interesting in light of previous research using a sample of individuals with PTSD only and individuals with PTSD and comorbid alcohol or cocaine dependency, in which the researchers found that comorbid PTSD participants endorsed more avoidance and hyperarousal symptoms than did PTSD-only participants while endorsing a similar number of reexperiencing symptoms (Saladin, Brady, Dansky, & Kilpatrick, 1995). Future research comparing individuals who use heroin with individuals who use alcohol and cocaine on levels of PTSD cluster symptoms might help to clarify these differences. Furthermore, because the relatively small sample size available for the current study precluded the use of the symptom clusters in the discriminant function analyses, future research using a larger sample should be undertaken to determine whether results would further support Saladin et al.'s findings.

As expected, levels of dissociative symptoms were significantly related to lifetime heroin use, with those participants reporting higher levels of dissociative symptoms being more likely to report having used heroin. These results are consonant with the *DSM-IV-TR* (APA, 2000) criteria for the avoidance/numbing symptom cluster in which clients report "efforts to avoid thoughts, feelings, or conversations associated with the trauma" (p. 218). Dissociation would provide a person a way to avoid the unpleasant thoughts and feelings associated with whatever trauma he or she has experienced.

The mean dissociation score for participants with a lifetime history of heroin use found in this study (M = 19.89, SD = 13.32) was considerably higher than that found in previous research. For example, Hodgins, Pennington, el-Guebaly, and Dufour (1996) reported a mean of 14.40 (SD = 13.60); Dunn et al. (1993) reported a mean of 14.70 (SD = 14.90); and Ross et al. (1992) reported a mean of 15.40 (SD = 13.20). The score was, however, somewhat lower than that found by Somer and Avni (2003) in their sample of individuals addicted to heroin (M = 21.27, SD = 15.02). Furthermore, 10% (n = 15) of the total sample and 17% (n = 6) of the heroin use group reported scores of 30 or higher, the conservative clinical cutoff point for screening for dissociative disorders (Carlson & Putnam, 1993). In addition, dissociation scores correctly distinguished heroin use group membership in 69% of the cases. Nevertheless, the dissociation score was a better predictor of no heroin use than of heroin use. That is, the DES was better able to screen out those who had never tried heroin than to screen in those who had. Our findings concerning both the PCL-C (avoidance/numbing) scores and the DES scores have some implications for counselors working with this population that are discussed later in this article.

Implications for Clinical Practice

It should be noted that 25% of the participants in this study admitted having used heroin at some point in their lives. Because the sample for the study consisted of the entire client census attending treatment on the day that the surveys were administered, practitioners and administrators working with a substance-abusing population should be aware that approximately 1 in 4 of their clients may have a history of lifetime heroin use. Heroin use places the individual at high risk not only for addiction but also for numerous negative legal and health-related consequences (Hser et al., 2007; Hser et al., 2001; Kalyoncu et al., 2007; Raj et al., 2007). Although clients may not be using heroin when they enter treatment, their use of this drug in the past

would indicate that they are willing to engage in very risky behavior. This tendency toward risky behavior, in addition to maintaining their addiction and increasing the potential for poor health outcomes, might affect treatment outcomes and relapse potential. Therefore, determining whether a client has used heroin at some point in his or her life will help the counselor formulate treatment plans and assignments that target not just heroin use but also the possible risky lifestyle that the client may prefer.

Another important implication of this study is the potential use of the DES in clinical settings. The need for an assessment tool such as the DES is made clear considering that Juhnke, Vacc, Curtis, Coll, and Paredes (2003), in a survey of substance abuse counselors, discovered that the frequency of use of assessment tools was very low. They showed that some of the most widely accepted assessment tools were rarely used by clinicians and hypothesized that substance abuse counselors may overrely on their abilities to diagnose without assessment tools because "they believe that they have sufficient clinical experience to make an accurate diagnosis without the use of standardized assessment instruments. However, such emphasis on clinical assessment may be unreliable and based on intuition, rather than on validated criterion data" (Juhnke et al., 2003, p. 69). These authors also indicated several other reasons for this apparent reluctance to use standardized assessment tools, including a lack of specific training on assessment, a bias against diagnosing, and a preponderance of master's-level counselors conducting assessments. Peters, Yocoubian, Baumler, Ross, and Johnson (2002) have suggested that clinicians need to be prepared to properly assess clients for specific drug usage (e.g., heroin) rather than for more generic substance use. Therefore, the present findings provide counselors with an initial indication that using the DES (a brief assessment tool that master's-level practitioners are qualified to use) can be a heroin-specific assessment tool to target treatment toward addressing either heroin use or risky behaviors, particularly with clients who are polyaddicted and treatment resistant.

The findings of this study also provide clinicians with some guidance about how the link between subclinical dissociation and heroin use may affect treatment. Dissociation is often thought of as falling on a continuum that goes from common daydreaming and absorption, to less common meditative and hypnotic experiences, to even less common shamanic possession and religious healing experiences, to the extremes of the dissociative disorders (Holmes et al., 2005; Martinez-Taboas & Bernal, 2000). The results of our analyses indicated that mean dissociation scores for both the heroin use and nonuse groups were below clinical levels; however, the mean was significantly higher for the heroin use group than for the nonuse group. It is possible, therefore, that clients with a history of heroin use may be more likely to engage in dissociation during treatment as a means of escape from the discomfort experienced during the treatment process than are their peers who do not use heroin. Thus, practitioners should become aware of the need for screening for dissociative disorders among their clients who abuse substances, particularly individuals who use heroin, because that kind of disorder could affect clients' ability to complete treatment successfully. Furthermore, they should keep their eyes open for signs of excessive daydreaming and absorption in their clients with a history of heroin use. These lower levels of dissociation indicate a tendency to psychologically wander away from therapeutic activities, thus placing these clients at higher risk of leaving treatment against clinical advice or of relapse.

The higher mean score on the DES reported by participants who admitted lifetime heroin use may also be particularly important in light of Peters et al.'s (2002) finding that heroin is a "drug of maintenance rather than a drug of experimentation" (p. 58). Any use of heroin is, of course, potentially dangerous because it is so highly addictive (Epstein & Gfroerer, 1997; Giannini, 1997; Inciardi & McElrath, 1998). Nevertheless, if clients have used heroin intermittently at subclinical levels, it may be possible that they have done so as a method for coping with underlying trauma (that has not produced the elevated symptoms associated with PTSD) when the memories associated with the trauma become overwhelming for some reason. The size of the sample in the current study precluded asking participants about their levels of heroin use over time. That is, we do not know what proportion of the participants acknowledging lifetime heroin use had used at subclinical abuse or dependency levels. Further research is needed to explore this issue in greater detail. In light of the results presented in the current study, however, counselors working with clients reporting any heroin use should assess their level of use over time to determine whether that use is related to discomfort associated with trauma in some way. Otherwise, clients who have not made an association between an experienced (or repressed) trauma may remain at elevated risk of relapse with inadequate therapeutic support. Information gathered from that assessment could then be used in treatment planning for a more targeted intervention.

Last, another important clinical practice implication of this study is that it provides counselors with a useful integration of research and practice that can be easily used by substance abuse counselors to provide the highest level of care for individuals who abuse heroin. The trend toward evidencebased practice and other elements of practice (e.g., assessment) that are informed by research findings is becoming increasingly important in the mental health field (Rosen, 2003; Walker, Koroloff, Briggs, & Friesen, 2007). Campbell, Daood, Catlin, and Abelson (2005) discussed several factors that impede the integration of research and practice in substance abuse, as well as several remedies to overcome these impediments. One remedy in particular that was suggested was to increase communication between researchers and practitioners. The current project represents a step toward this effort by partnering academic researchers with substance abuse clinicians in the field at a treatment center in a collaborative effort. Further practice-based research with individuals who use heroin is clearly needed to address the gaps in the knowledge base concerning trauma, PTSD symptomatology, dissociation, and heroin use.

Limitations

There are a number of methodological issues that must be taken into consideration when interpreting the findings of this study. First, the sample used in this study included a relatively small number of participants reporting heroin use, making interpretation of results difficult. Furthermore, the participants were all attending inpatient treatment in an urban environment, thus limiting representativeness of the sample and generalizability to other substance-abusing populations. Finally, participants were predominantly European American and Caucasian, further limiting generalizability to different racial and ethnic groups.

Directions for Future Research

Results of this study suggest several areas for future research. First, because 1 in 4 participants in this study admitted lifetime heroin use and because heroin use is associated with negative legal and medical problems, future research should examine associations between lifetime use, general and specific health issues, legal issues, comorbid substance use disorders, and comorbid psychological disorders. Exploration of these variables in a population of individuals using heroin at subclinical levels could paint a more complete picture of a group that may be at high risk for negative health and legal outcomes as well as for treatment dropout and relapse. Furthermore, future research should include questions about the severity of use over time so that distinctions could be made between levels of use and comorbid conditions.

This study informs the need for future research that includes individuals with histories of PTSD and heroin use at both clinical and subclinical levels. Future research should also be undertaken to determine whether there are relationships between dissociation and individual PTSD symptom clusters, as well as between dissociation and illicit drug use other than heroin and other frequent comorbid conditions, including depression. These studies should use large enough sample sizes to ensure sufficient power for multivariate analysis. They should also include instruments that better measure the type and severity of reported traumatic events to improve predictive capabilities. This research is essential to better understand the relationships between factors affecting individuals experiencing comorbid conditions. In addition, future research should replicate this study using larger and more racially and ethnically diverse samples so that results could be generalized to other groups.

Conclusion

Despite the aforementioned limitations, the current study fills a gap in the literature concerning factors associated with lifetime heroin use. Considering the scarcity of research in this area, this study examined multiple interrelated

factors that have the potential to affect the development of trauma, dissociation, and substance-related problems. The results of this study indicated that levels of dissociative symptoms were positively associated with lifetime heroin use, whereby participants who reported having used heroin were more likely to report higher levels of dissociate symptoms than were those who denied use. These preliminary findings contributed to the existing literature by providing evidence for the comorbid relationship between dissociation and substance use disorders, particularly lifetime heroin use. This study also pointed to the potential clinical utility of the DES as a brief assessment tool to measure dissociative symptoms among individuals who abuse substances. Future investigations should examine associations between lifetime heroin use; the severity of use; and other risk factors, including health issues, legal issues, and other comorbid psychological disorders.

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