Published in final edited form as:
Child Youth Care Forum. 2012 February ; 41(1): 37–55. doi:10.1007/s10566-011-9151-9.

Severity of Victimization and Co-Occurring Mental Health Disorders Among Substance Using Adolescents

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Abstract

Background—Co-occurring mental health disorders are widespread among substance using adolescents. Severity of victimization may be an important factor in explaining co-occurrence of mental health problems among adolescents with substance misuse problems.

Purpose—The purpose of this study was to evaluate whether severe victimization experiences were shared risk factors for internalizing only, externalizing only, and co-occurring internalizing and externalizing disorders among victimized substance-using adolescents.

Method—Data for this cross-sectional study were obtained from a multisite research project. Adolescents, ages 11–18, participated in a comprehensive screening program for substance abuse at 106 Substance Abuse and Mental Health Services Administration (SAMHSA) Center for Substance Abuse Treatment (CSAT)-funded grantee sites throughout the United States.

Results—Longer duration/frequent victimization, more than one type of victimization, and recent victimization were related to co-occurring internalizing and externalizing disorders. Victimization by a trusted person, however, was only related to internalizing disorders.

Conclusion—The findings show that some indicators of severe victimization experiences are shared risk factors for internalizing, for externalizing, and for co-occurring internalizing and externalizing problems, thus providing support for the common factors model of co-morbidity. These findings suggest that practitioners in substance abuse treatment must thoroughly assess for severe victimization experiences among adolescents presenting with co-occurring mental health issues. Treatment planning and interventions may focus on helping adolescents cope effectively with their victimization experiences and addressing their MH needs.

Keywords

Severity of victimization; Internalizing; Externalizing; Substance use; Co-occurring disorders; Adolescents

Introduction

The co-occurrence of mental health (MH) disorders among substance-abusing adolescents is often the rule and not the exception (Chan et al. 2008). *The co-occurrence of MH disorders* or *comorbidity* is “the presence of more than one diagnosis, whether exclusively psychiatric or both psychiatric and medical (nonpsychiatric) ” (Starcevic 2005). “One disorder of each type can be established independent of the other and is not simply a cluster of symptoms

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resulting from a single disorder" (Center for Substance Abuse Treatment 2005). According to the *common factor model of comorbidity* (Krueger and Markon 2006), a common risk factor can cause symptoms for two different types of disorders. For example, research shows that chronic life stressors, severity of substance misuse and victimization experiences are shared risk factors for internalizing and externalizing problems among adolescents (Berthold 2000; Boney-McCoy and Finkelhor 1995; Chan et al. 2008; Compas et al. 1993; Elze 2002; Kaplan et al. 1998; Menard 2010; Saha et al. 2006; Turner et al. 2010).

Substance using adolescents with co-occurring MH disorders are likely to enter treatment with greater impairment in functioning, less social conformity, more history of engagement in illegal activities, and are less responsive to treatment than are adolescents with either substance use or MH disorder (Beitchman et al. 2001; Hiller et al. 1996). Adolescents with co-occurring disorders, therefore, demand more attention and services compared with adolescents with one type of disorder (Grella et al. 2004). Adolescents are more vulnerable to co-occurring internalizing and externalizing problems due to their challenging and stressful transitional stage of development (Cicchetti and Rogosch 2002). Both internalizing and externalizing problems commonly co-occur with substance use problems.

Internalizing disorders (ID) among children and adolescents are considered inner-directed, and the core symptoms are associated with over inhibition, over control, and shy-anxious problems (Achenbach 1982; Reynolds 1990). According to Krueger et al. (1998), internalizing disorders relate to "withdrawal from the external world" (e.g., anxiety). *Externalizing disorders* (ED) are outerdirected or undercontrolled (Reynolds 1990) and are related to "moving against the world." Individuals with externalizing disorders are "at odds with society" (Krueger et al. (1998). Therefore, it is important to examine factors that are linked to internalizing and externalizing disorders among substance using adolescents (Chan et al. 2008; Crowley and Riggs 1995; Grilo et al. 1995; Ronnlund and Karlsson 2006).

Research findings assert that victimization experiences can lead to internalizing and externalizing disorder problems among adolescents (Margolin and Gordis 2000). Victimization experiences, considered traumatic, have been associated with internalizing problems, such as depression and anxiety (Taylor and Weems 2009) and externalizing problems, for example, violent (Kimonis et al. 2011), criminal and deviant behaviors (Kerig et al. 2011; Mallie et al. 2011; Riggs Romaine et al. 2011). However, victimization (Margolin and Gordis 2000; Titus et al. 2003) and other adverse experiences (Weems et al. 2010) vary based on severity levels and severity of their impact on adolescents. Adolescents with more severe victimization experiences may be at greater risk for severe or multiple MH problems (such as co-occurrence of ID and EDs), than adolescents with less severe or no victimization experiences.

Although researchers have found that type of victimization (e.g., physical or sexual abuse) is related to both internalizing and externalizing problems, the association of severity of victimization with co-occurring ID and ED symptoms among substance-using adolescents is a relatively neglected area of study. Severity may have a greater effect than victimization type (Higgins 2004) in explaining the relationship between victimization and internalizing and externalizing disorders among adolescents. Therefore, in this study, experiencing more than one type of victimization and other indicators of severity are viewed as more important than the type of victimization for understanding co-occurring ID and ED problems among substance-using adolescents.

Drawing from the common factor model of co-morbidity, this research examined whether severity of victimization was a common risk factor for internalizing and externalizing disorders among substance-using adolescents. It was hypothesized that adolescents with

severe victimization experiences are more likely to exhibit co-occurring ID and ED problems than they are to exhibit an ED-only, an ID-only, or neither an ID nor an ED problem. Furthermore, the indicators of severity of victimization that predict an ID-only problem will also predict an ED-only problem.

Severity of Victimization and MH Outcomes

According to Titus et al. (2003), *severity* includes those characteristics of victimization noted in the literature as heightening the trauma of victimization experiences. They called these characteristics *traumagenic*, as they were related to increased trauma, which, if unresolved, could result in subsequent MH and behavioral problems in adolescence and adulthood (Titus et al. 2003). Barnett et al. (1993) defined *severity of victimization* as "the relative seriousness of the act with regard to the potential negative psychological impact that a caregiver's act may have on the child's socio-emotional development" (Barnett et al. 1993, p. 53). However, severity of victimization includes both physical and psychological harm. Typically it is assessed based on the degree of actual or potential harm (Dubowitz et al. 1993). This study examines those indicators of severity that have empirical support for poor psychological outcomes.

Severity indicators of victimization may result in poor MH, regardless of types of victimization experiences. However, research shows mixed findings. For instance, Naar-King et al. (2002) examined the severity of physical and the severity of sexual abuse among 187 adolescents and found varying effects for victimization type. Duration of physical abuse was related to elevated symptoms of internalizing disorders, while duration of sexual abuse did not predict variations in internalizing symptoms independent of other characteristics and concomitant abuse (Naar-King et al. 2002). In contrast, in other studies that only examined one type of victimization, the findings were different. For example, longer duration of sexual abuse was associated with poor mental health outcomes (Davis et al. 2002).

Severity may have a greater impact than victimization type in explaining the relation between victimization and MH disorders. In a cluster analysis of data on adult survivors of abuse, Higgins (2004) found that the best cluster solution grouped victims according to their severity (i.e., high, medium, and low levels of severity of maltreatment clusters) rather than their experiences of separate types of abuse (sexual, physical, psychological, neglect, and witnessing violence). Individuals in the high maltreatment cluster had significantly poorer adjustment problems than those in the medium and low clusters (Higgins 2004). Thus, severity of victimization may be associated with poor MH outcomes, regardless of victimization type. Furthermore, there is substantial overlap between types of victimization, making it difficult to examine severity of type of victimization. Therefore, in this study, it is hypothesized that indicators of severity (e.g., frequency or duration of victimization) will result in internalizing and externalizing problems, regardless of the types of victimization experiences.

The indicators of severity in this study include frequency or duration of victimization, victimization by trusted perpetrators, and recency. These indicators of severity have been found to be associated with internalizing and externalizing problems (e.g., Danielson et al. 2005; Kaplow and Widom 2007; Naar-King et al. 2002; Perron et al. 2008). Additionally, this study includes multiple types of victimization as an indicator of severity, as this characteristic of victimization experience has been found to have a greater impact on the MH of adolescents than does a single type of victimization. Moreover, as research shows, multiple types of victimization have been found to be associated with higher comorbidity rates (Ackard and Neumark-Sztainer 2003; Herrenkohl and Herrenkohl 2007; Langeland et al. 2004).

Factors associated with severe victimization experiences (e.g., helplessness, hopelessness, betrayal of trust, humiliation, guilt, shame) may place adolescents at risk for both ID and ED problems. Frequent victimization, for long duration, by trusted perpetrators and multiple types of victimization experiences are characteristics of unsafe and unhealthy social environment, and likely to be detrimental to normal and healthy development. Some adolescents may cope by internalizing, while other adolescents may cope by externalizing their feelings.

However, studies have not focused on the effects of these indicators of severity on co-occurring ID and ED problems among substance using adolescents. Furthermore, severity of victimization has been under-studied among adolescents, and most research has focused on child and adult, not adolescent, populations (Naar-King et al. 2002). Making strong predictions, therefore, about the relation between severity of victimization and co-occurring IDs and EDs among substance-using adolescents is difficult. Nevertheless, severity of victimization is likely to play an important role in understanding variability in MH among substance-using adolescents and was tested in this study. It was anticipated that adolescents with more severe victimization experiences will be more likely to have co-occurring ID and ED problems than adolescents who have not experienced severe victimization.

Method

Data for this cross-sectional study were obtained from a multisite research project. Adolescents, ages 11–18, participated in a comprehensive screening program for substance abuse at 106 Substance Abuse and Mental Health Services Administration (SAMHSA) Center for Substance Abuse Treatment (CSAT)-funded grantee sites throughout the United States. Only those sites that served adolescents and agreed to share their data for secondary analysis were included in my study. The study procedures at each of these sites were approved by their local institutional review boards. A common standardized assessment procedure was used at grantee sites, and de-identified data were shared under the auspices of a HIPAA-compliant data-sharing agreement. The secondary analysis of data for this research was approved by the Institutional Review Board (IRB) at the University of Iowa.

The present study used a nonprobability purposive sampling procedure to select adolescents who were assessed for admission to substance abuse treatment. Selection criteria for this study included adolescents who reported any type of lifetime victimization (physical, sexual, or emotional abuse) and who reported use of substances or met criteria for abuse or dependence in the past year.

Instruments and Measures

Data were collected using the Global Appraisal of Individual Need–Intake version (GAINI), a standardized instrument package administered for research purposes and to support clinical decision-making for diagnosis, placement, treatment planning, and service use. It has eight sections covering background information, substance abuse, physical health, risk behaviors, mental health, environment, legal information, and vocational information. GAIN's measures have been validated with collateral reports, urine tests, follow-up methods, and treatment records (Dennis 1999; Dennis et al. 2008; Garner et al. 2008).

GAIN-I includes well-established measures with psychometric properties (internal consistency, test–retest reliability, and validity) examined in previous studies. The alpha internal consistency reliability estimates for the core substance abuse and mental health dimensional scales are 0.90 or higher (Dennis et al. 2006). On subscales of substance abuse and mental health scales, Substance Abuse Disorder Scale, General Victimization Scale, General Conflict Tactic Scale, and others, the Cronbach's alpha internal consistency

reliability coefficients ranged from 0.69 to 0.92. Test–retest reliabilities of GAIN-I measures are to be more than $r = 0.70$ for the days of substance use and symptom counts, $r = 0.85$–0.95 for the core scales, and 0.70–0.90 for the core subscales (Dennis 1999; Dennis et al. 2002, 2003; Titus et al. 2003).

Among the validity studies, adolescents' self-reports ($n = 143$) have been found to be consistent with collateral reports and onsite urine testing ($\kappa = 0.53$–0.69) (Godley et al. 2002). A cross-validation of adolescents' symptoms counts of internal and external distress and conduct disorders on the GAIN to the Child Behavior Checklist found that similar scales on the two measures were correlated around 0.60; unrelated scales had correlations of 0.0–0.40 (Dennis et al. 2002). Titus et al. (2003) provided evidence for the construct validity of the General Victimization Index by demonstrating its relationship to frequency and recency of victimization, and more severe types of victimization, such as sexual assault. Psychometric information for each of the variables in this study follows.

Dependent Variables—*Internalizing Disorders* were assessed using the following measures from the GAIN-I:

The Major Depressive Disorder Index (MDDI, Past Year; 12 items, $\alpha = 0.85$). It is based on a count of past-year DSM-IV symptoms of depression. Adolescents met the criteria of MDD if they endorsed at least five of 13 symptoms on the MDDI and the required symptoms on the measure (e.g., feeling very trapped, lonely, sad, blue, depressed, or hopeless about the future; losing interest or pleasure in work, school, friends, sex, or other things one cared about).

The Generalized Anxiety Disorder Index (GADI, Past year; 9 items, $\alpha = 0.83$). It is a count of past-year DSM-IV symptoms of anxiety disorders. Adolescents met the criteria of GAD if they endorsed more than three symptoms and two required symptoms on the GADI (e.g., feeling very anxious, nervous tense, scared, panicked, or like something bad was going to happen; being unable to control, or having difficulty controlling, one's worries).

Externalizing Disorder was measured using the following scale:

The Conduct Disorder Scale (CDS, Past Year; 15 items, $\alpha = 0.82$). The CDS is based on a count of past-year DSM-IV symptoms of conduct disorder (e.g., having been a bully or threatening other people, starting fights with other people, having been physically cruel to animals),, with higher scores indicating greater delinquency, and three or more endorsed items suggesting conduct disorder.

Independent Variables—*The General Victimization Scale* (GVS; 15 items, $\alpha = 0.82$) from the GAIN-I was used to measure indicators of severity of victimization. The GVS is part of the environment and living-situation domain of the GAIN-I. The first section focuses on the occurrence of lifetime traumatic events (physical abuse with or without use of a weapon, and sexual and emotional abuse). Adolescents who endorsed at least one type of victimization completed items in the second section of the scale. This section focuses on characteristics of the abuse experience that makes the experience more traumatic (Titus et al. 2003).

This research examined the following indicators of severity of victimization:

Multiple types of victimizations. Items from the GVS were used to assess three types of victimizations experienced: physical abuse with or without a weapon, sexual abuse, and emotional abuse. A categorical variable was created to classify adolescents into two categories: those with more than one type of victimization, and those with a single type of

victimization. Adolescents who endorsed two or three types of victimization were multiply victimized and assigned the value of 1 (multiple type of victimization = 1, single type = 0).

Duration/frequency was measured using the following item from the GVS: “Did any of the previous things” (physical abuse with or without use of a weapon, sexual or emotional abuse) “happen several times or over a long period of time?” (Yes = 1, No = 0).

Victimization by trusted perpetrators was measured using the following item from the GVS: “Did any of the previous things” (victimization) “happen where one or more of the people involved were a family member, close family friend, professional, or someone else you had trusted?” (Yes = 1, No = 0).

Recency of victimization was measured using an item from the GVS that focused on the last time the adolescent was attacked or abused. This variable was dichotomized, with a value of 1 assigned to adolescents who were victimized within the last year (recently victimized = 1, victimized more than a year before = 0).

Control Variables—This study included demographic and other variables such as gender (Darves-Bornoz et al. 1998; Wall et al. 2005), age (Finkelhor et al. 2007a, b), race/ethnicity (McLaughlin et al. 2007; Moisan et al. 1997), family structure (Tanaka 2005; Vandervalk et al. 2005), sources of stress (Kim et al. 2003), and substance use severity (Chan et al. 2008) as controls, since they are related to both ID and ED symptoms among adolescents.

Demographic Variables Gender was measured using a dichotomous item in the GAIN-I (male = 0, female = 1). Family structure was also measured using a dichotomous variable (single-parent family = 1, other types of families = 0). Ethnicity included dummy-coded variables: African Americans, Hispanics, and other races. *Caucasian* was the reference group. Age was measured using a continuous variable.

Sources of Stress The Other Sources of Stress Index (OSSI), a nine- item summative index was used to measure sources of stress. The OSSI is based on the number of sources of environmental stress, such as transportation problems, discrimination in the community, or threat of losing a job. Higher values on the scale are associated with a greater variety of environmental stressors (Theoretical range: 0–9).

Severity of Substance Misuse The Substance Severity Measure (Past Year, SSMY) from the GAIN-I was used to measure abuse and dependence. It measures severity of substance misuse on a scale of 1–5 (1 = no use, 2 = substance use, 3 = substance abuse, 4 = substance dependence, and 5 = substance dependence with physiological symptoms). Adolescents with no use were excluded from this study. The variable was dummy coded using four categories: use, substance abuse, substance dependence without physiological symptoms (tolerance and withdrawal), and substance dependence with physiological symptoms, with users as a reference group. This measure is created using the *Substance Abuse Index-Past Year* (α = 0.70) and *the Substance Dependence Scale-Past Year*(α = 0.83).

The *Substance Abuse Index-Past Year* (SAI, α = 0.70) is based on the four DSM-IV symptoms of substance abuse in the past year (for example, you kept using alcohol or drugs even though you knew it was keeping you from meeting your responsibilities at work, school, or home). The *Substance Dependence Scale-Past Year* (SDS, α = 0.83) is based on the count of seven DSM-IV symptoms of substance dependence in the past year (for example, you were unable to cut down or stop using alcohol or drugs, needed more alcohol or drugs to get high, had withdrawal problems such as shaking hands and throwing up). Three lifetime symptoms of dependence plus one in the past year are used to diagnose substance dependence.

Using the DSM-IV criteria, adolescents with fewer than three symptoms on SDS and more than one symptom on SAI were assigned to the substance-abuse group. Those with more than three symptoms on SDS were assigned to the substance-dependence group without physiological symptoms. Adolescents who scored greater than 3 on SDS, including symptoms of withdrawal, were assigned to the group with dependence with physiological symptoms.

Data Analysis Procedures

Bivariate Analysis—Using the *Chi-square* test of association, statistically significant differences in dichotomously scored variables (demographic characteristics, substance abuse, substance dependence, severity of victimization) for ID-only, ED-only, neither ID nor ED problem groups, and co-occurring ID and ED problems groups were evaluated. A one-way between-subject Analysis of Variance (ANOVA) procedure was used to compare the mean scores on continuous variables (stressors and age) for adolescents with ID-only, ED-only, neither ID nor ED problem groups, and co-occurring ID and ED problems. Further, for overall tests that were significant, post-hoc tests were calculated to examine which groups were significantly different from each other. Bonferroni post-hoc was used for ANOVA analysis. For Chi-square post-hoc tests, group differences were examined by testing the statistical significance of Chi-square for each dichotomous independent and dependent variable in a two-by-two table. The bi-variate results are presented in Table 1.

Multivariate Analysis—A mixed effects multinomial logistic regression analysis was conducted including random effects for site to site variability. The analysis examined the relationship between dependent variable and severity of victimization, after controlling for demographic variables, stressors and severity of substance misuse. Multinomial logistic regression is used when the categorical dependent variable has more than two categories. It is an extension of binary logistic regression and involves simultaneous estimation of binary logits for all possible comparisons among the categories for dependent variables (Long 1997). The categories can be ordered or unordered (e.g., nominal), with one category of the dependent variable used as a reference group. The coefficients for all other dependent variable categories are used to describe how the predictor variables are related to the probability of being in that group versus the reference group.

In this study, the dependent variable included four nominal categories, namely: an internalizing-only problem (ID), an externalizing-only problem (ED), both internalizing and externalizing problems, and neither internalizing nor externalizing problem. The analysis was conducted multiple times, each time changing the reference group to draw comparisons using these categories of dependent variables. In the first regression, the neither internalizing nor externalizing problem group was the reference group. In the next regression, the ID-only group was selected as the reference group. In the third regression, the reference group was the ED-only group. The comparisons of interest were then selected to present the study findings.

Given the number of related independent variables under consideration in the model, variance inflation factors were evaluated to check for the presence of multicollinearity, with no evidence suggesting for such a finding. Odd ratios (ORs) with corresponding 95% confidence intervals (CIs) were calculated, with likelihood ratio testing for model fit. All statistical analyses were performed using Stata 11.

Results

Sample Characteristics

The sample was comprised of 69.2% males (n = 1,429) and 30.8% females (n = 637), with a mean age of 15.6. Most of the sample was nonwhite (53.5%, n = 1,106); 46.5% were white (n = 960). The largest minority group was African American, (17.8%, n = 368) followed by Hispanic (14.1%, n = 291). Four percent of the sample was Native American (n = 78), 0.7% was Asian (n = 15), and 17.2% mixed and other races (n = 354). Because of their small sample sizes, Native Americans and Asians were combined into the category "Other Races."

Among these adolescents (n = 2,066), 60.3% (n = 1,246) reported experiences of physical abuse with a gun, knife, or other weapon; 49.9% (n = 1,031) reported physical abuse by striking or beating; 10% (n = 207) reported sexual abuse; and 45.7% (n = 944) of adolescents reported experiences of emotional abuse. Among indicators of severity of victimization, 22.6% (n = 467) of the adolescents reported multiple types of victimization, 50.6% (n = 1,045) were frequently victimized or for a long duration, 44.6% (n = 921) were victimized by someone they trusted, and 58.1% (n = 1,201) were victimized within the last year.

Most adolescents in the sample had a diagnosis of substance dependence (47.3%, n = 977). Adolescents with substance dependence–only diagnoses (n = 94, 4.5%) were combined with those who had a diagnosis of substance dependence with physiological symptoms (n = 883, 42.7%) because adolescents with substance dependence only represented a small proportion of cases. Thirty-five percent of adolescents (n = 724) had a diagnosis of substance abuse. Substance users (those without abuse or dependence diagnoses) comprised the smallest proportion of the sample (17.7%, n = 365). One-third of the adolescents (32.5%, n = 672) reported comorbidity of internalizing and externalizing problems, followed by adolescents with an externalizing-only problem (23.9%, n = 494) and adolescents with an internalizing-only problem (11.2%, n = 232) (see Table 1).

Effects of Control Variables

In the multivariate analysis, some of the control variables significantly increased the odds of co-occurring, internalizing-only (ID), and externalizing-only (ED) problems among adolescents. Adolescents with substance dependence and more stressors were at higher risk for co-occurring ID and ED problems (versus neither problem, versus an ID problem and versus an ED problem). Compared with male victims, female victims appeared to be at greater risk for co-occurring ID and ED problems than an ED problem and neither problem. Race/ethnicity emerged as a significant predictor of externalizing and internalizing problems. While African American victimized adolescents were at greater risk for an ED problem (versus co-occurring ID and ED problems), Hispanic adolescents were at higher risk for an ID problem than co-occurring ID and ED problems. Younger victimized adolescents appeared to be at greater risk for co-occurring ID and ED problems and an ED problem, whereas older victimized adolescents appeared to be at risk for an ID problem.

Effects of Severe Victimization Experiences

As hypothesized, the results indicated that having severe victimization experiences significantly increased the likelihood of co-occurring ID and ED problems among adolescents (Table 2). For severe victimization experiences, the odds of co-occurring ID and ED problems were greater than the odds of an ID problem, an ED problem or neither problem. An adolescent with multiple types of victimization experiences was more likely to have co-occurring ID and ED problems than an adolescent with single type of victimization experience. If the adolescent was multiply victimized, the odds that he or she had co-

occurring ID and ED problems (versus neither problem) increased by 91% (OR = 1.91). In addition, if the adolescent was multiply victimized, the odds that he or she had co-occurring ID and ED problems (versus an ED problem) increased by a factor of 1.66 (66%).

Furthermore, an adolescent who was frequently victimized or for a long duration was more likely to have co-occurring ID and ED problems (versus an ED problem) than an adolescent who was not frequently victimized or was not victimized for a long duration. If the adolescent had been frequently victimized or for a long duration, the odds that he or she had a co-occurring ID and ED problems (versus an ED problem) increased by 49% or by a factor of 1.49. Compared with the odds of an ID problem, duration or frequency of victimization did not significantly change the odds of co-occurring ID and ED problems, after adjusting for the effects of other variables in the model.

Recently victimized adolescents were more likely to have co-occurring ID and ED problems than adolescents victimized more than a year ago. If the adolescent was recently victimized, the odds that he or she had co-occurring ID and ED problems (versus an ID problem) increased by 83% (OR = 1.83). Furthermore, if the adolescent was recently victimized, the odds that he or she had co-occurring ID and ED problems (versus neither problem) increased by 61% (OR = 1.61). In addition, recent victimization significantly increased the odds of co-occurring ID and ED problems (versus an ED-only problem) by a factor of 1.30. Controlling for all other variables in the final model, however, victimization by trusted people did not increase the odds of co-occurring ID and ED problems when compared with the odds of an ID problem, or an ED problem.

Severe victimization experiences appeared to be common risk factors for ID and ED problems among adolescents. Three out of four victimization experiences did not differentiate adolescents with an ID-only problem from adolescents with an ED-only problem. Controlling for all other variables in the model, however, if the adolescent was victimized by someone he or she trusted, the odds that he or she would have an ID problem (versus an ED problem) increased by 52% (OR = 1.52). Thus, victimization by trusted people may place adolescents at risk for ID problems.

Discussion

Using the common factor model of comorbidity, severe victimization experiences were hypothesized to be shared risk factors for ID and ED problems. The study found that indicators of victimization severity predicted co-occurring ID and ED problems, whereas, with the exception of victimization by trusted perpetrators, indicators of victimization severity were not associated with a single type of MH problem (i.e., ID-only or ED-only problem).

For types of severe experiences, frequently victimized adolescents or those victimized for longer duration were more likely to have co-occurring ID and ED problems, than were adolescents without frequent/long duration victimization experiences. These findings are consistent with research that suggests frequent victimization and/or longer duration victimization can place adolescents at risk for both ID and ED problems (Finkelman 1995; Naar-King et al. 2002). One explanation for these findings is that longer duration or frequent victimization experiences may place excessive demands on coping or pose a risk for maladaptive coping due to which adolescents may internalize or externalize their responses to these experiences. Additionally, frequent or long duration experiences imply that adolescents may have been experiencing abuse for a long time that has not been reported. Therefore, they may not have received timely mental health services or services to prevent re-victimization.

Adolescents with multiple types of victimization experiences were more likely to have co-occurring ID and ED problems, than were adolescents with a single type of victimization experiences. The findings are in line with research that shows multiple types of victimization relate to a greater number of, and more severe, negative outcomes than do single types of victimization (Finkelhor et al. 2007a, b). The traumagenic dynamics involved in multiple types and more frequent victimization experiences (e.g., powerlessness and betrayal) or repeated negative messages that something is wrong with the victim, or he or she is at fault for the abuse, may increase the likelihood of both ID and ED problems.

Adolescents who reported being victimized within the past year were more likely to have co-occurring ID and ED problems than were adolescents who were victimized more than a year ago. Recently victimized adolescents may still be experiencing abuse or be worried about future abuse. Adolescents currently in abusive relationships have more MH and behavioral problems than do those who had been abused in the past (Luster and Small 1997). Studies on adults also provide support for the negative effects of recent victimization. Recent abuse among adults has been associated with more dysfunctional coping methods and poorer MH than less recent abuse (Dale et al. 2009).

Adolescents who were victimized by trusted perpetrators were more likely to have ID problems than were those victimized by a nontrusted abuser. These findings were similar to Trembley et al.'s findings (1999). They found that children victimized by a close adult had more internalizing symptoms than those victimized by a more distant perpetrator (e.g., stranger or someone outside the family). A betrayal of trust by an emotionally close perpetrator may result in hurtful emotions and internalizing consequences (Leary et al. 1998; Trembley et al. 1999). In contrast, victimization by trusted perpetrators was not significantly related to an ED problem. Thus, victimization by trusted perpetrators may not be a shared risk factor for ID and ED problems, as predicted by the common-factors model for comorbidity.

Among the control variables, the study found some evidence for racial/ethnic differences in MH problems, with African Americans more likely to externalize and Hispanics more likely to internalize than other ethnic groups. These findings are consistent with some authors who found racial/ethnic differences in MH symptoms of victimized adolescents (Hatcher et al. 2009). Cultural variations in values are one possible explanations for these differences. For example, African American culture may place a higher value on confrontation and assertiveness, which may be labeled as an externalizing behavior (McLaughlin et al. 2007).

Gender was associated with significant differences in MH problems. Females were more likely to have an ID-only problem than males, and males were more likely to have an ED-only problem than females. Although these findings are consistent with the empirical literature that shows a relationship between gender and types of MH problems, the studies on gender variations among adolescents in internalizing and externalizing problems are mixed. While most studies show males in the general population are more likely to externalize (Darves-Bornoz et al. 1998; Gallerani et al. 2010), a national probability study on victims of child maltreatment show female adolescents are more likely to externalize than male adolescents (Wall et al. 2005). A study on gender differences in psychiatric symptoms among adolescents by Edokpolo et al. (2010) found that females with substance use disorders had more externalizing and internalizing problems than males. In this research, female adolescents appeared to be at higher risk than males for co-occurring ID and ED problems and ID-only problems.

In this study, age was another characteristic significantly related to MH. Studies show that internalizing and externalizing problems may increase or decrease with age. The change in

MH problems with age may occur due to numerous psychological, biological, social, and contextual factors (Compas et al. 1995). In this study, older adolescents were more likely than younger adolescents to have an ID-only problem. In contrast, younger adolescents were more likely than older adolescents to have an ED-only or co-occurring ID and ED problems. These findings are consistent with research that suggests that internalizing and externalizing symptoms vary markedly across childhood and from early to late adolescence (McLaughlin et al. 2007).

Adolescents with substance abuse diagnoses were more likely to have an ED-only problem, versus neither ID nor ED problems, than were adolescents who did not meet the criteria of substance abuse. This is in line with research that shows a link between externalizing problems and substance abuse (see Jester et al. 2008). In contrast, adolescents with substance dependence diagnoses, in this research, were more likely to have co-occurring ID and ED problems (versus ID-only, ED-only or neither ID nor ED problems) than were adolescents with no substance dependence diagnoses. The high rate of co-occurring ID and ED problems among substance-dependent adolescents in this study is consistent with research by Chan et al. (2008). In their study of 4,938 adolescents and 1,958 adults assessed for substance-abuse treatment, they found rates of co-occurring ID and ED problems were higher among respondents with past year dependence than those without. Substance dependence, therefore, appears to be a risk factor for co-occurring ID and ED problems, and substance abuse appears to be a risk factor for ED-only problems among victimized adolescents.

Stressors were significantly related to ID and ED problems among victimized adolescents. Adolescents who experienced a larger number of stressors were more likely to have co-occurring ID and ED problems (versus ED-only, versus ID-only or neither ID nor ED problems) than were adolescents with a smaller number of stressors. Additionally, adolescents with a large number of stressors were more likely to have an ID-only problem (versus ED-only) than adolescents with small number of stressors. Thus, stressors appear to be a risk factor for co-occurring ID and ED problems and ID-only problems among victimized adolescents.

Research shows stressors activate neurobiological responses necessary for individuals' survival. If they occur frequently, these responses increase the risk of psychopathology in childhood and adolescence. Stressors may particularly trigger the onset of internalizing or externalizing symptoms in adolescents with certain types of genes and environmental experiences (Gunnar and Quevodo 2007). Moreover, stressors, perceived as uncontrollable events have also been associated with severity of substance misuse (King and Chassin 2008) and mental health (Scheniderman et al. 2005; Turner et al. 2006; Turner and Lloyd 1995). Thus, life stressors are important factors that must be considered in future research and in substance abuse treatment with adolescents who have ID and ED issues.

Limitations of the present study include cross-sectional design and use of self-report data. The findings of the study might differ if multiple informants had been included and any inconsistencies between reports from adolescents and other sources had been evaluated. The sample included adolescents who were assessed at the time of intake for substance- abuse treatment, and, therefore, is not representative of the nonclinical population. The results on severe victimization experiences may have been influenced by the timing of the adolescents' assessments. Due to limited time at intake assessment, the clinical staffs were unable to develop rapport with their clients. A good rapport is necessary to discuss sensitive issues such as severe victimization experiences (Perron et al. 2008). Nevertheless, the findings are significantly strong to warrant attention to the role of severe victimization experiences in explaining comorbidity of ID and EDs among substance using adolescents.

Implications for Practice

The findings of the study have implications for prevention, assessment, and interventions. In this study, severe victimization histories were related to co-occurring ID and ED problems among adolescents. Co-occurring ID and ED problems among substance-using adolescents have been associated with other problems, such as crime involvement and poor treatment response (Chan et al. 2008). Therefore, a quality treatment plan for substance using adolescents may require addressing other issues besides substance problems such as victimization experiences and MH needs. Integrated, trauma-informed treatment services (Clark 2002; Finkelstein et al. 2004; Harris 1998; Hawkins 2009) for substance using adolescents could be useful, as well as providing SA, MH and victim services in the same program. Trauma-sensitive treatment "refers to incorporating an awareness of trauma and abuse into all aspects of treatment and the treatment environment" (Clark 2002, p. 1). Trauma-sensitivity needs to be incorporated in assessments, placement decisions, and prevention and intervention programs.

Given that severe victimization experiences appear to contribute to the risk of co-morbidity, assessment of adolescents presenting for substance abuse treatment must include not only a general assessment of a possible victimization history but an in-depth evaluation of severity of victimization. This additional depth would encompass specific dimensions of the experience (such as single versus multiple experiences, ongoing victimization, and so on) and questions about what happened, how it happened, why it happened, and what is to be done (Wall and Levy 2005). A mixed-method instrument including quantitative and qualitative questions may be useful to examine the range of severe victimization experiences among these adolescents. For example, qualitative questions focusing on adolescents' stories of victimization experiences in their own words may be useful to explore context and severity of victimization and the impact on adolescents.

For treatment planning and interventions, focusing on treating MH outcomes of specific types of victimization may not cover the full-range of adolescents' treatment needs. It is crucial to address severe victimization experiences that may put them at risk or have harmful effects. According to Cohen et al. (2006), "effective treatment models may target specific symptoms clusters, developmental level, and/or level of severity/chronicity more than specific types of maltreatment/trauma experiences" (p. 739). This study found negative MH consequences associated with recent victimization, multiple types of victimization, frequent victimization experiences and for longer duration and, victimization by trusted perpetrators. As a large proportion of adolescents are less likely to have experienced single event victimization, one type of victimization or victimization only by a stranger, it is important for practitioners to understand their complex experiences in developing treatment plans. For instance, this study found that experiences of multiple types of victimization increased the risk for both internalizing and externalizing problems among adolescents. As adolescents often experience multiple types of victimization, interventions must be designed targeting the effects of multiple types of victimizations.

In their review of studies on the treatment of MH consequences of victimization, Cohen et al. (2006) argued that interventions which effectively reduce MH problems in children exposed to one type of victimization are also effective for other types of victimization or for multiple types. For instance, trauma-focused cognitive behavioral therapy (TF-CBT), originally developed for sexual abuse victims, has been tested and shown to be effective for multiply victimized children.

The findings that severe victimization experiences are risk factors for co-occurring MH problems have key implications for prevention. They underscore the need for early identification of at-risk children and adolescents to prevent the onset of MH or behavioral

problems. Early identification of risk can be done in multiple settings, such as schools, foster care, or juvenile justice residential facilities. Professionals working with children and adolescents in these settings must be made aware of the negative effects of victimization experiences on mental and behavioral health of children and adolescents. They must be trained in identifying at-risk children or adolescents and connecting them to appropriate resources. Timely mental health services can help promote adaptive coping among victimized adolescents and reduce their risk for developing substance abuse or MH problems.

Prevention efforts must also focus on reducing the risk for re-victimization. Adolescents with severe victimization histories and those in current abusive relationships are more likely to be revictimized. As recommended by Perron et al. (2008), prevention efforts in the form of psycho-education and cognitive-behavioral therapy groups included as part of the substance abuse treatment may help reduce the risk of victimization. Prevention efforts may promote use of resources that may prevent the onset of mental and behavioral health problems among victimized adolescents.

Conclusion

This study provided substantial support for the common-factor model of comorbidity. Severe victimization experiences consistently emerged as significant predictors for co-occurring ID and ED problems. Victimization by a trusted perpetrator, however, was the only type of victimization experience that was related to an ID problem rather than with an ED problem. This finding shows that although severe victimization experiences are shared risk factors for comorbidity of internalizing and externalizing problems, some indicators of severity of victimization may place adolescents at greater risk for one problem versus another.

Acknowledgments

This study was supported by funding from the CSAT/SAMHSA, under contract #277-00-6504 or #277-00-6500, using data provided by the following grantees: (TI14090, TI14103, TI14188, TI14189, TI14196, 67TI14214, TI14252, TI14254, TI14261, TI14267, TI15415, TI14271, TI14272, TI14283, TI14311, TI14315, TI14355, T1I4376, TI15348, TI15413, TI15415, TI15421, TI15447, TI15461, TI15466, TI15467, TI15475, TI15479, TI15481, TI15485, TI15486, TI15489, TI15511, TI15514, TI15524, TI15527, TI15545, TI15562, TI15577, TI15584, TI15586, TI15670, TI15671, TI15672, TI15674, TI15677, TI15678, TI15682, TI15686, TI16915, TI16928, TI16961, TI16984, TI16992, TI17055, TI17070, TI13601, TI16400, TI16414, TI17433, TI17434, TI17446, TI17475, TI17476, TI17484, TI174604, TI17769, TI17779, TI17788, TI17825, TI13308, TI13309, TI13313, TI13322, TI13323, TI13340, TI13344, TI13345, TI13354, TI13356, TI13305). Any opinions about this data are those of the author and do not represent official positions of the government or individual grantees.

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Child Youth Care Forum. Author manuscript; available in PMC 2013 February 01.

Table 1

Sample characteristics and differences between neither internalizing nor externalizing, internalizing-only, externalizing-only, and both internalizing and externalizing problems groups

	Total sample (*n* = 2,066)	**Neither internalizing nor externalizing problems (a) (*n* = 668)**	**Internalizing only problems (b) (*n* = 232)**	**Externalizing only problems (c) (*n* = 494)**	**Both internalizing and externalizing problems (d) (*n* = 672)**	***P***
Gender n (%)						
Males	1,429 (69.2)	546 (38.2) *	123 (8.6) *	408 (28.6) *	352 (24.6) *	0.00
Females	637 (30.8)	122 (19.2)	109 (17.1)	86 (13.5)	320 (50.2)	
Age (M, SD)	15.6 (1.22)	15.6 (1.21)*c*	15.9 (1.14)*cd*	15.4 (1.19)*ab*	15.4 (1.26)*b*	0.00
Single-parent n (%)	1,071 (51.8)	349 (32.6)	133 (12.4)	261 (24.4)	328 (30.6)	0.14
Race/ethnicity n (%)						
White	960 (46.5)	273 (28.4) *	107 (11.1)	215 (22.4)	365 (38.0) *	0.00
Black	368 (17.8)	168 (45.7) *	34 (9.2)	100 (27.2)	66 (17.9) *	0.00
Hispanic	291 (14.1)	101 (34.7)	41 (14.1)	73 (25.1)	76 (26.1)	0.57
Other	447 (21.6)	126 (28.2)	50 (11.2)	106 (23.7)	165 (36.9)	0.09
Substance use n (%)						
Use only	365 (17.7)	189 (51.8)	41 (11.2)	81 (22.2)	54(14.8)	0.00
Abuse	724 (35)	307 (42.4)	63 (8.7) *	216 (29.8) *	138 (19.1) *	0.00
Dependence	977 (47.3)	172 (17.6) *	128 (13.1)	197 (20.2) *	480 (49.1) *	0.00
Stressors (M, SD)	1.25 (1.59)	0.71 (1.15)*bcd*	1.49 (1.56)*acd*	0.99 (1.33)*abd*	1.89 (1.89)*abc*	0.00
Indicators of severity of victimization n (%)						
Frequent/long duration victimization	1,045 (50.6)	267 (25.6) *	136 (13.0) *	217 (20.8) *	425 (40.7) *	0.00
Victimization by trusted perpetrators	921 (44.6)	215 (23.3) *	138 (15.0) *	186 (20.2) *	382 (41.5) *	0.00
Multiple types of victimization	467 (22.6)	86 (18.4) *	64 (13.7) *	83 (17.8) *	234 (50.1) *	0.00
Recent victimization	1,201 (58.1)	334 (27.8) *	119 (9.9)	287 (23.9)	461 (38.4) *	0.00

P values are based on ANOVA and Chi-square tests

a, b, c, d Subscripts refer to groups (Group a = Neither; Group b = Internalizing-only group; Group c = Externalizing-only group; d = Group with both internalizing and externalizing problems), and show which groups were statistically significant from the group with the subscript. These differences were tested using Bonferroni post-hoc test

* Refers to adolescents in the group being significantly different from adolescents in other groups. Statistically significant differences were examined using two-way Chi-square tests

Table 2

Multinomial logistic regression results

	COD[1] (versus neither) *OR* (95% *CI*)	COD (versus an ID[2] problem) *OR* 95% *CI*)	COD (versus an ED[3] problem) *OR* (95% *CI*)	An ID problem (versus an ED problem) *OR* (95% *CI*)
Gender	2.91*** (2.15–3.93)	0.96 (0.68–1.34)	3.57*** (2.62–4.86)	3.76*** (2.57–5.49)
Age	0.87** (0.79–0.97)	0.74*** (0.64–0.84)	1.03 (0.93–1.15)	1.39*** (1.21–1.61)
Single parent	1.09 (0.85–1.42)	0.78 (0.57–1.07)	0.99 (0.78–1.29)	1.27 (0.92–1.77)
African American	0.45** (0.31–0.66)	0.67 (0.40–1.10)	0.57** (0.39–0.85)	0.91 (0.56–1.47)
Hispanic	0.75 (0.50–1.11)	0.56* (0.35–0.89)	0.79 (0.53–1.19)	1.50 (0.93–2.43)
Other race	0.97 (0.69–1.35)	0.92 (0.62–1.38)	0.93 (0.67–1.29)	1.00 (0.65–1.53)
Substance abuse	1.88** (1.26–2.81)	1.59 (0.95–2.69)	1.17 (0.76–1.81)	0.74 (0.46–1.22)
Substance dependence	9.18*** (6.22–3.55)	2.77*** (1.73–4.43)	3.59*** (2.38–5.42)	1.31 (0.83–2.08)
Stressors	1.52*** (1.38–1.67)	1.09* (1.00–1.21)	1.27*** (1.17–1.39)	1.16** (1.04–1.29)
Duration/frequency	1.51** (1.16–1.97)	1.11 (0.80–1.55)	1.49** (1.14–1.96)	1.35 (0.96–1.90)
Victimization by trusted perpetrators	1.35* (1.02–1.79)	0.73* (0.52–1.04)	1.12 (0.84–1.48)	1.52* (1.06–2.18)
Multiple victimization	1.91*** (1.37–2.64)	1.24 (0.87–1.77)	1.66*** (1.20–2.28)	1.33 (0.89–1.99)
Recency of victimization	1.61*** (1.24–2.09)	1.83*** (1.33–2.51)	1.30* (0.99–1.69)	0.73 (0.52–1.01)

Including random effects for site to site variability

* $P \leq 0.05$;

** $P \leq 0.01$;

*** $P \leq 0.001$; Odds Ratios (OR) and Confidence Intervals (CI) shown COD refers to co-occurring internalizing and externalizing disorders

ID refers to an internalizing-only problem
ED refers to an externalizing-only problem