1-1-2007

Victimization and Posttraumatic Stress Disorder among Runaway and Homeless Adolescents

Les B. Whitbeck
University of Nebraska - Lincoln, lwhitbeck2@unl.edu

Dan R. Hoyt
University of Nebraska - Lincoln, dhoyt2@unl.edu

Kurt Johnson
University of Nebraska - Lincoln

Xiaojin Chen
Tulane University

Published in *Violence and Victims* 22:6 (2007), pp. 721–734.

Victimization and Posttraumatic Stress Disorder among Runaway and Homeless Adolescents

Les B. Whitbeck, PhD
Dan R. Hoyt, PhD
Kurt D. Johnson, PhD
University of Nebraska-Lincoln

Xiaojin Chen, PhD
Tulane University

Abstract
This article presents lifetime and 12-month prevalence rates and comorbidity for posttraumatic stress disorder (PTSD) among a sample of 428 homeless and runaway adolescents. Data are from baseline interviews of a longitudinal diagnostic study of 428 (187 males; 241 females) homeless and runaway adolescents aged 16-19 years (mean age = 17.4 years, SD = 1.05). The data were collected by full-time street interviewers on the streets and in shelters in eight Midwestern cities of various populations. About one-third (35.5%) of the runaways met lifetime criteria for PTSD and 16.1% met 12-month criteria for the disorder. More than 90% of the adolescents who met criteria for PTSD met criteria for at least one of the other four diagnoses. Multivariate analyses indicated that correlates of PTSD were age of adolescent, being female, having experienced serious physical abuse and/or sexual abuse from an adult caretaker, and having been assaulted or injured by weapon when on the street. The multiplicative interaction between sexual abuse by caretaker and sexual assault when the adolescents were on their own was statistically significant, indicating that rape victims were highly likely to meet criteria for PTSD regardless of early sexual abuse. At very high levels of early sexual abuse, the probability of meeting criteria for PTSD converges with that for sexual assault victims.

Keywords: homeless adolescents, runaways, victimization, posttraumatic stress

Besides living in a war zone, the vulnerability posed by running away and the experiences associated with being homeless and alone may pose the greatest risk for posttraumatic stress disorder among adolescents. Making one's way on the streets is extremely stressful for adults (Goodman, Saxe, & Harvey, 1991) and is even more so for adolescents, whose vulnerability is increased by their developmental stage and societal norms of adult protection and supervision (Whitbeck & Hoyt, 1999). The first diagnostic criterion for posttraumatic stress disorder (PTSD) in the *Diagnostic and Statistical Manual-III-R* (*DSM-III-R*) is that the individual has been involved in a traumatic event that is "outside of the range of usual human experience" (American Psychiatric Association, 1987, p. 236). Examples of what would constitute a traumatic event include experi-

ences such as rape, molestation, being threatened with a weapon, witnessing a traumatic event, being in a bad accident, and being the victim of a physical attack (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). The lives of runaway and homeless youth are characterized by atypically high frequency of these types of traumatic experiences (Kipke, Simon, Montgomery, Unger, & Iverson, 1997; Whitbeck & Hoyt, 1999).

Estimates of the prevalence of lifetime PTSD from epidemiological studies of the adult population have been relatively constant. Rates of lifetime PTSD have been estimated to be in the range of 10%-12% for women, and 5%-6% for men (Breslau, Davis, Andreski, & Peterson, 1991; Kessler et al., 1994; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). Generally, rates tend to be lower for younger persons, largely reflecting less cumulative risk exposure for traumatic events. For example, PTSD rates for young persons aged 15 to 24 years from the National Comorbidity Survey were 10.3% for women and 2.8% for men (Kessler et al., 1994). Using data from a national probability sample, Kilpatrick et al. (2003) reported rates of 3.7% for boys and 6.3% for girls aged 12-17 years.

Risk Factors among Homeless And Runaway Adolescents

It is well documented that runaway and homeless adolescents often come from physically and sexually abusive family environments (Janus, Burgess, & McCormack, 1987; Kipke et al., 1997; Kufeldt & Nimmo, 1987; Tyler, Hoyt, Whitbeck, & Cauce, 2001; Whitbeck & Hoyt, 1999). Compared to housed youth, reports from both the parents and the youth indicate that the early home experiences of homeless youth are characterized by caretaker neglect, abuse, and violence (Whitbeck, Hoyt, & Ackley, 1997). Caretaker maltreated runaway and homeless youth are about twice as likely as those who were not maltreated to manifest serious psychological and learning disabilities (Sullivan & Knutson, 2000). Once on their own, the adolescents are exposed to sexually predatory behaviors of adults and other street youth, violence, or the witnessing of violence. Self-reported victimization rates are extremely high (Hagan & McCarthy, 1997; Hoyt, Ryan, & Cauce, 1999; Whitbeck & Hoyt, 1999) as is the almost constant fear of victimization (Kipke et al., 1997). This fear of victimization is accompanied by stresses associated with shelter life, loss of protective supervision of adults, and the loss of routine and predictability in everyday life (Goodman et al., 1991). Moreover, existing stress symptoms may be amplified among those with histories of victimization (Whitbeck, Hoyt, &Yoder, 1999).

Diagnostic Studies of PTSD among Homeless and Runaway Adolescents

Very few studies have addressed PTSD among homeless adolescents. Several studies have included PTSD symptom measures (Buckner & Bassuk, 1997; Mundy, Robertson, Robertson, & Greenblatt, 1990), while others estimated PTSD among sheltered adolescents who had never spent time directly on the streets (McCaskill, Toro, & Wolfe, 1998), thus excluding those particularly at risk. We could locate only two prior studies that included diagnostic assessments of PTSD in samples of homeless youth who have actually spent time on the streets. Feital, Margetson, Chamas, and Lipman (1992) used the Diagnostic Interview for Children and Adolescents-Revised (DICA-R) to assess 150 New York City adolescents. Nearly one-third (32%) of the adolescents met lifetime criteria for PTSD. Cauce et al. (2000) used the Diagnostic Interview Schedule for Children-Revised (DISC-R) to in-

terview 364 youth in the Seattle metropolitan area and concluded that 12% met criteria for PTSD. They point out that this was likely to be a lower-bound estimate due to a protocol that omitted the PTSD module for interviews where the earlier modules of the DISC had taken longer than 2 hours to administer. This occurred in 7% of the interviews. The length of the other diagnostic components is likely associated with meeting criteria for one or more disorders and, considering the general population estimates of high comorbidity between PTSD and other disorders (Kessler et al., 1994), it is logical to assume the lifetime PTSD rates in the Seattle sample may have been higher. In summary, the two diagnostic studies that have been based on samples of street youth provide mixed evidence regarding prevalence of lifetime PTSD.

Theory and Hypotheses

Homeless adolescents often leave situations where they have been victimized (Janus et al., 1987; Kipke et al., 1997; Kufeldt & Nimmo, 1987; Tyler et al., 2001; Whitbeck & Hoyt, 1999) only to experience the traumatic stress associated with living in public places (Goodman et al., 1991), fear (Kipke et al., 1997), and further victimization when they are on their own (Hagan & McCarthy, 1997; Hoyt et al., 1999; Whitbeck & Hoyt, 1999). Experiencing homelessness amplifies existing symptoms resulting from troubled backgrounds (Whitbeck, Hoyt, & Yoder, 1999). The experiences of street life provide much to exacerbate existing psychological symptoms and little or nothing to ameliorate them. Indeed, if not symptomatic, street life may induce symptoms of depression and symptoms associated with traumatic stress (Whitbeck, Johnson, Hoyt, & Cauce, 2004).

In this study we report lifetime PTSD prevalence rates and comorbidity patterns associated with PTSD from a sample of 428 homeless and runaway adolescents contacted on the streets and in shelters in four Midwestern states. The purpose of the study was to investigate the ways contexts of victimization and precocious independence are associated with lifetime PTSD, For example, in the multivariate analysis we hypothesized that maltreatment by caretakers would be the principal stressor for meeting criteria for PTSD. After that, we hypothesized that more proximal victimization at the point of running away or while the adolescents were on their own would be an important correlate of PTSD and reduce the effects of early maltreatment to nonsignificance.

We also included in the multivariate analyses other variables that have been shown to be associated with risk for PTSD. Meeting criteria for PTSD is typically associated with being an older adolescent and being female (Kilpatrick et al., 2003; Whitbeck & Hoyt, 1999). We also included sexual orientation in the regression models because adolescents with same-sex sexual orientation are more likely to be rejected by caretakers, kicked out of the house, and victimized once on the streets (Cochran, Greer, & Mays, 2003; Cochran, Stewart, Ginzler, & Cauce, 2002; Whitbeck, Chen, Hoyt, Tyler, & Johnson, 2004).

Method

Sampling Procedures

Full-time specially trained street interviewers directly interviewed 428 (187 males; 241 females) homeless and runaway adolescents on the streets and in shelters in eight Midwest-

ern cities (St. Louis; Kansas City, MO; Omaha; Lincoln; Des Moines; Cedar Rapids; Iowa City; Wichita). Seven full-time street interviewers were employed and housed in street outreach agencies. All but one of the street interviewers were experienced street workers who had been employed by street outreach agencies; several had experienced periods of homelessness themselves. Those who had no direct street experience had bachelor's degrees in social services or the equivalent.

To be eligible to participate in the study the young person had to be between the ages of 16 and 19 years and homeless. Our definition of "homeless" was that the adolescent must be residing in a shelter, on the street, or living independently (e.g., with friends, transitional living) because they had runaway, been pushed out, or drifted out of their family of origin. All of the adolescents were interviewed either in shelters, on the streets, or in independent living situations (e.g., transitional living, apartments or squats with friends). None were currently living with their caretakers.

Because research has indicated that sampling designs that involve multiple points of entry to homeless populations are most effective in generating diverse samples (Burt, 1996; Koegel, Burnam, & Morton, 1996), the sampling design involved repeatedly checking locations where homeless adolescents were likely to be found in each of the cities. Locations included shelters, drop-in centers serving homeless youths, and various street locations where homeless adolescents congregate. The interviewers were instructed to go to these locations at various times of the day on weekdays and weekends. They were to approach shelter residents, and locate eligible respondents in various locations throughout the cities. In shelters and drop-in centers, only adolescents who met criteria as runaways were interviewed. On the streets, adolescents who were known to be homeless were approached as were those who appeared to be homeless. The interviewers were to continue recruiting until their caseload reached 60 adolescents, whom they would then track and reinterview at 3-month intervals. The actual interviews were performed in a range of circumstances from shelter interview rooms, outreach vans, apartments where adolescents may be doubling up with friends or relatives, quiet comers of restaurants, and outside.

The length of the baseline interview raised concerns about subject burden. Therefore, the first wave interview was conducted in two parts. The first part consisted of a social history and symptom scales. The respondent was then asked to meet for a second interview during which the diagnostic interviews were conducted. Typically the two interviews were conducted in the same week. In some cases there was up to 2 weeks between first and second interview. Although refusal rates varied across sites, on average, 90% of the adolescents who were approached for an initial interview and who met study criteria agreed to participate in the study. Of 455 respondents who completed the first interview, 429 (94.3%) completed the second first-wave interview. Those who did not complete both interviews were older, more likely to be heterosexual, and more likely to have experienced less victimization when on their own than were completers of both interviews. The respondents were paid $25 for the first interview and $25 for the second.

Informed Consent Procedures

The adolescents were informed that this was a longitudinal study and the tracking protocols were explained. Informed consent was a two-stage process. First, the study was explained and informed consent was obtained from the adolescent. They were assured that refusal to participate in the study, refusal of any question, or stopping the interview process would have no effect on current or future services provided by the outreach agency

that provided office space for the interviewer. Second, all adolescents were asked if we could contact their parents. If permission was granted, parents were contacted, informed consent was obtained, and the parents were asked to participate in a computer-assisted telephone interview. If the adolescent was sheltered, we followed shelter policies of parental permission for placement and guidelines for granting such permissions. These policies were always based on state laws. In the few cases where the adolescent was under 18 years, not sheltered, and refused permission to contact parents, the adolescents were treated as emancipated minors in accord with National Institute of Health guidelines (U.S. Department of Health and Human Services, 2001). A National Institute of Mental Health Certificate of Confidentiality was obtained to protect the respondent's statements regarding potentially illegal activities (e.g., drug use).

Computer-Assisted Personal Interview Training Procedures

The interviewers underwent 2 weeks of intensive training regarding computer-assisted personal interviewing (CAPI) procedures and administering the four indices (major depressive episodes, PTSD, alcohol use/abuse, and drug use/abuse) from the University of Michigan-Composite International Diagnostic Interview (UM-CIDI) (Kessler, 1994a, 1994b) and one index from the DISC-R. They then returned to their shelters and administered several "practice" interviews with staff and respondents 20 years old or older. After completing their practice interviews the interviewers returned to the university for a 2nd week of training. All interviews were conducted on laptop computers and downloaded electronically to a special secure university server.

With diagnostic interviewing using a computerized version of the UM-CIDI, the skip patterns and question fills are processed automatically by the computer program. The interviewers were all trained by staff who had completed the CIDI course on the administration and scoring of the interview. The scoring of diagnostic categories was completed using the CIDI scoring algorithms. The diagnostic estimates generated by the computerized administration and scoring of the CIDI have been shown to be consistent with independent evaluations by trained clinicians (Wittchen, 1994).

Sample Characteristics

Sixty-one percent of the males interviewed and 39% of the females had spent at least one night directly on the streets. When asked where they had stayed "last night" (i.e., night prior to interview), 40% had spent the night before in a shelter, 11% in a relative's home, 16% in the home of a friend or "acquaintance," 16% in a foster/group home (operated by the street agency), 6% in their own apartment (transitional living programs operated by street agency), and about 10% in an abandoned house, on the street, or in similar settings. The number of times the adolescents had run away ranged from 1-51 times, with a mean of 8 runs (SD)=11.2).

The adolescents ranged in age from 16-19 years, with an average age of 17.4 years (SD = 1.05). Fifty-nine percent were European American, 22% were non-Hispanic African American, 5% were Hispanic, and the remaining self-identified as American Indian, Asian or Pacific Islander, or biracial. Fifteen percent identified themselves as gay, lesbian, or bisexual. Sixty-two percent of the adolescents reported that the population of their city of origin was 100,000 or greater, 10% said they were from a suburb of a large city, 8% were from a medium-sized city (50,000-100,000), 8% were from a small city (10, 000-50,000), and 12% were from small towns or rural communities of 10,000 or less.

Measures

The UM-CIDI was used to assess major depressive episode, PTSD, alcohol abuse, and drug abuse. The UM-CIDI is based on *DSM-III-R* criteria and represents the University of Michigan revision of the CIDI (World Health Organization [WHO], 1990) used in the National Comorbidity Study (NCS; for information regarding the University of Michigan revisions, see Kessler, 1994a, 1994b). Our use of the UM-CIDI allowed direct comparisons to prevalence rates from the NCS. Because the NCS sample age range is from 15 to 54 years, we were able to select out NCS respondents of the same age range as those in our sample (16-19 years). The CIDI (WHO, 1990) from which the UM-CIDI is derived is a well-established diagnostic instrument (see Wittchen, 1994 for review) that has shown excellent interrater reliability, test-retest reliability, and validity for the five diagnoses that were used in this study. The UM-CIDI is currently a state-of-the-science diagnostic interview schedule that has been used extensively with trained interviewers who are not clinicians.

To assess behavioral problems, the conduct disorder module was used from the DISC-R. The DISC-R is a highly regarded, structured interview intended for use with trained interviewers who are not clinicians. It has been shown to have from good to excellent interrater and test-retest reliability (Jenson et al., 1995; Shatter et al., 1993).

Age of adolescent at time of interview was calculated using the date of birth of the respondent and the date of the baseline interview. **Gender of adolescent** was coded 0 for females and 1 for males. Of the adolescents interviewed, 44% were males and 56% were females.

Adolescent sexual orientation was assessed by a question in which the adolescents identified themselves as straight, heterosexual, gay/lesbian, bisexual, never thought about it, something else, or confused or unsure. The variable was receded so that any individual listing a nonheterosexual or unsure sexual identity was coded as nonheterosexual.

Caretaker abuse was assessed with two separate constructs: caretaker physical abuse and caretaker sexual abuse. To measure **severe physical abuse** adolescents were asked how often an adult who was taking care of them had beat them with their fists, ever verbally or physically threatened them with a gun or knife, or ever wounded or physically hurt them with a gun or knife. To measure **sexual abuse** adolescents were asked if any adult taking care of them had asked them to do something sexual or had ever made them do something sexual. Response categories were receded to never, once, or more than once. The mean scales had a range from 0 to 3 with higher values indicating experiencing a wider range of severe physical abuse and sexual abuse.

Age on own was a single item that asked the adolescents how old they were when they left home and were on their own for the first time. The mean age adolescents were first on their own was 13.4 years old (SD = 2.97).

Street victimization was assessed with two individual items that asked adolescents about their experience of sexual or severe physical assaults while they were on their own. **Sexual assault on their own** was measured by asking the adolescents if while they were on their own how often they been sexually assaulted or raped. **Severe physical assault on own** was measured by asking the adolescents if while they were on their own how often had they been assaulted and wounded with a weapon. Response categories were receded to indicate if they had ever experienced either a sexual assault or a physical assault with a value of 1 indicating that they had.

Results

Prevalence and Comorbidity

In all, more than one-third (35.5%) of the adolescents met lifetime criteria for PTSD. Nearly twice as many female runaways (44.8%) as males (23.5%) met lifetime criteria. Sixteen percent of the adolescents met 12-month criteria for PTSD. The prevalence of 12-month PTSD among the females runaways (19.9%) was almost double that for males (11.2%).

PTSD rarely occurred alone (Table 1). More than 90% of the adolescents who met criteria for PTSD met criteria for at least one of the other four diagnoses. Almost one-half of the runaways (48%) who met criteria for PTSD also met criteria for major depressive disorder. Nearly all of the male adolescents (93.2%) and three-fourths (75.9%) of the females who met criteria for PTSD also met criteria for conduct disorder (CD). More than one-half of the male runaways (59.1%) who met criteria for PTSD also met criteria for alcohol and drug abuse. About half of the female runaways (48%) with PTSD also met criteria for alcohol abuse, and 44% also met criteria for drug abuse.

Trauma Experiences Among PTSD Adolescents

Of the runaway adolescents who met criteria for PTSD, nearly two-thirds (63.8%) had experienced severe physical abuse by a caretaker (e.g., hit with fist, beaten, threatened or assaulted with a weapon; see Table 2). Male adolescents (79.6%) were significantly more likely to report severe caretaker physical abuse than were females (57.4%). One-half the adolescent PTSD females had experienced caretaker sexual abuse compared to 20.5% of the PTSD males.

Table 1. Comorbidity of PTSD with Other Midwest Longitudinal Study of Homeless Adolescents Diagnostic Measures

	All (n = 152) %	Male (n = 44) %	Female (n = 108) %
PTSD and MDE	48.0	45.5	49.1
PTSD and CD	80.9	93.2*	75.9
PTSD and alcohol abuse	51.3	59.1	48.1
PTSD and drug abuse	48.7	59.1	44.4

*$p < .01$ between males and females.

Table 2. Experience of Trauma among Those Diagnosed with Lifetime PTSD (%)

	Total (n = 152)	Female (n = 108)	Male (n = 44)
Ever experience severe parental abuse	63.8	57.4**	79.6
Ever experience parental sexual abuse	41.5	50**	20.5
Early runaway (< 14 years old)	51.2	49.1	59.1
Physically assaulted with weapon on own	32.9	27.8*	45.5
Sexually assaulted on own	29.6	41.7**	0.0

*$p < .05$ between males and females diagnosed with lifetime PTSD (ANOVA). **$p < .01$ between males and females diagnosed with lifetime PTSD (ANOVA).

Many had experienced significant trauma when on the streets. Nearly one-half (45.5%) of the PTSD males and 27.8% of the females had been assaulted with a weapon. Of the female runaways, 42% had been sexually assaulted.

Bivariate Correlations

All of the variables in the regression model, with the exception of age of adolescent, were significantly correlated with lifetime prevalence of PTSD (Table 3). Females, adolescents with same-sex sexual orientation, and those who ran away for the first time before age 14 were all significantly likely to meet lifetime criteria for PTSD. The abuse and assault variables showed the strongest correlations with PTSD: sexual abuse by a caretaker (r = .31), severe caretaker physical abuse (r = .23), followed by sexual assault (r = .22) and physical assault (r = .15) when on their own.

Multivariate Analyses

We used logistic regression models to investigate factors associated with the adolescents meeting lifetime criteria for PTSD (Table 4). With only age, gender, and sexual orientation in Model 1, older adolescents and females were more likely to meet lifetime criteria for PTSD. Female runaways were about three times more likely to meet lifetime criteria for PTSD than were males (OR = .35). Each year of age from 16 to 19 years increased the likelihood of meeting PTSD criteria by 28% (OR = 1.28). Sexual orientation was not statistically significant.

The addition of severe caretaker physical abuse greatly improved the fit of Model 2. For each unit increase in the measure of severe caretaker physical abuse, the likelihood of meeting lifetime criteria for PTSD increased two-fold (OR = 2.03). In Model 3, caretaker sexual abuse was introduced into the equation and significantly improved its fit. For each unit of increase in our measure of caretaker sexual abuse, the likelihood of meeting lifetime criteria for PTSD increased by 60% (OR = 1.60).

Age of first runaway episode was added to the equation in Model 4, and it was nonsignificant. Because they were highly correlated, the street variables assaulted with a weapon and sexual assault (r = .36) were added in separate models. In Model 5, assault or

Table 3. Bivariate Correlations for All Variables Included in Analysis

	PTSD	1	2	3	4	5	6	7
1. Age	.056							
2. Gender	–.221**	.218**						
3. Sexuality	–.105*	–.083	.113*					
4. Age on own	–.127**	.065	–.029	–.049				
5. Caretaker physical abuse	.234**	.142**	.034	–.086	–.169**			
6. Caretaker sex abuse	.308**	.093	–.256**	–.182**	–.190**	.255**		
7. Assaulted on own	.153**	.238**	.187**	–.013	–.220**	.277**	.101*	
8. Sexual assault on own	.218**	.073	–.330**	–.162**	–.074	.179**	.357**	.176**

*p <.05. **p<.01.

Table 4. Logistic Regression Model Predicting Meeting PTSD Lifetime Diagnosis Criteria (N = 422)

	Model 1		Model 2		Model 3		Model4		Model 5		Model 6		Model 7	
	b	*Exp(b)*	*b*	*Exp(b)*	*b*	*Exp(b)*	*b*	*Exp(b)*	*b*	*Exp(b)*	*b*	*Exp(b)*	*b*	*Exp(b)*
Age	0.24	1.28**	0.18	1.2*	0.14	1.15	0.16	1.18	0.11	1.17	0.15	1.16	0.14	1.15
Gender (male =1)	–1.05	.35***	–1.13	.32***	–0.91	.41***	–0.95	0.39***	–1.04	.35***	–0.86	.42***	–0.81	0.45***
Heterosexual	–0.38	0.68	–0.32	.073	–0.17	0.85	–0.21	0.82	–0.20	0.82	–0.18	0.83	–0.16	0.85
Severe parental abuse			0.71	2.03***	0.58	1.78***	0.54	1.'72***	0.49	1.63***	0.52	1.68***	0.55	1.73
Parental sexual abuse					0.47	1.60***	0.43	1 54***	0.43	1.54***	0.40	1.50***	0.67	1 95***
Age on own							–0.06	0.94	0.04	0.96	–0.06	0.94	–0.05	0.95
Assaulted or injured with weapon on own									0.61	1.84**				
Sexually assaulted on own											0.31	1.36	0.87	2.38**
Sexual assault on own × Parental sexual abuse													–0.67	0.51***
Constant	–4.08	0.02	–3.43	0.03	–3.04	0.05	–2.59	0.08	–2.00	0.13	–2.53	0.08	–2.58	0.08
Model χ^2	28.31***		48.30***		64.16***		66.38***		70.92***		67.06***		74.156***	
χ^2 Change			19.98***		15.87***		2.12		4.53**		0.99		7.10	

*p < .10. **p < .05. *** p < .01 (one–tail test).
Age Model 2, p = .09.

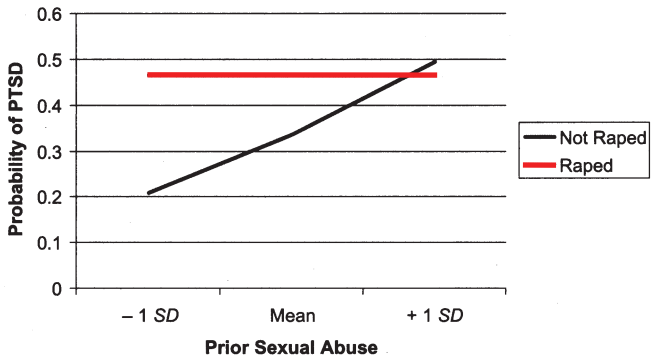

Figure 1. Multiplicative interaction between caretaker sexual abuse and sexual assault when adolescents were on their own.

injury with a weapon nearly doubled the likelihood of meeting lifetime criteria for PTSD (OR = 1.84). However, sexual assault when on the street was not significantly correlated with PTSD even without physical assault in the equation (Model 6). The relationship between sexual assault when the adolescents were on their own and PTSD became more understandable when we introduced the multiplicative interaction between caretaker sexual abuse and sexual assault after the adolescents were on their own to the equation in Model 7. The interaction was statistically significant and significantly improved the fit of the model. The interaction (Figure 1) indicated that regardless of experiencing caretaker sexual abuse, sexual assault is highly associated with meeting criteria for PTSD. However, as rates of caretaker sexual abuse increase, the likelihood of meeting criteria for PTSD increases until at the highest levels of caretaker sexual abuse the probability of meeting criteria for PTSD converges with that for sexual assault victims.

Discussion

PTSD was very prevalent among the runaway and homeless adolescents, and it seldom occurred alone. It was most likely to be comorbid with conduct disorder. Nearly all of the males and three-fourths of the females who met criteria for PTSD also met criteria for conduct disorder. This is an important finding indicating that many runaways with severe behavioral problems are also experiencing symptoms of trauma. This may be overlooked if the youth enter the criminal justice system. Moreover, PTSD occurred in conjunction with depression and substance abuse disorders at rates of about 50%. This high likelihood of PTSD occurring with other serious mental disorders among runaway and homeless adolescents indicates that regardless of whether the adolescents present with externalizing or internalizing symptoms there are apt to be underlying symptoms of trauma.

PTSD adolescents reported multiple serious traumatic experiences. Nearly two-thirds had a history of severe caretaker physical abuse, and one-half of the females had been sexually abused. Nearly one-half of the male adolescents had been assaulted or wounded with a weapon when on the streets, and nearly one-half of the females reported having been sexually assaulted when on their own.

Our hypothesis that proximal trauma would supersede the effects of more distal caretaker trauma was not supported in the multivariate analysis. However, the multiplicative interaction between more proximal sexual assault when the adolescents were on their own and caretaker sexual abuse indicated that both affected the likelihood of meeting criteria for PTSD. Sexual assault when the adolescents were on their own was highly associated with PTSD without regard to prior sexual abuse. However, as sexual abuse increased to very high levels, its effects were similar to those for adolescents who were sexually assaulted when on their own. This indicates that high levels of distal sexual trauma have the same effects of more proximate sexual trauma on lifetime PTSD.

The picture that emerges for an adolescent runaway who meets lifetime criteria for PTSD is that of an older female adolescent (recall the sample age range was 16-19 years) who has experienced caretaker physical and/or sexual abuse and who has been subsequently victimized when on her own. Early traumatic experiences associated with caretakers were very robust correlates of PTSD and remained statistically significant even when more proximal victimization variables were added to the regression equations. Although we need longitudinal data to verify this, our findings suggests the origins of PTSD are often in the home and often predate running away.

Limitations

Although this study is a significant contribution to our understanding of PTSD among homeless and runaway adolescents, it has several important limitations that should be taken into consideration. The most central is that it is a nonprobability sample. However, we believe the findings from the Midwestern sample are conservative estimates of what may be occurring in larger magnet cities and that data from multiple sites are a step forward from single-shelter, single-city diagnostic studies. A second limitation is that the findings are limited to adolescent self-reports and do not include parent reports. However, the 16-19 year age range puts our respondents within the age parameters of UM-CIDI diagnostic interviews for the National Comorbidity Survey (Kessler et al., 1994), which were based on self-reports. This report is based on *DSM-III-R* scheduled interview protocols and algorithms. Criteria for the *DSM-IV* (American Psychiatric Association, 2000) are slightly less restrictive than those for the *DSM-III-R*, which may conservatively estimate the prevalence of PTSD. Another methodological limitation is that having only a single interviewer at five of the six sites and that the interviewers were working in six widely separated metropolitan areas made testing interrater reliabilities difficult. This was also complicated by subject burden and subject recontact. Although we tested for interrater reliability during our practice sessions, we are unable to provide this information from the field.

Clinical Implications

These results have serious clinical implications. Runaway adolescents who present with symptoms of PTSD are highly likely to meet criteria for one or more other psychiatric diagnoses. Those most at risk for PTSD are those most likely to have engaged in dangerous or antisocial behaviors. PTSD adolescents also should be evaluated for to co-occurring affective disorders. The high number of PTSD adolescents who are abusing alcohol and drugs warrants serious clinical attention in treatment programs. Based on these cross-sectional findings, we can't determine whether the traumatic symptoms emerge as

a consequence of victimization associated with substance abuse or whether the substance abuse is a self-medicating response to trauma symptoms. Likely it is some combination of the two. Regardless, PTSD should be taken into account when runaways present with symptoms of substance abuse. Moreover, these results indicate that PTSD in this population occurs in response to multiple serious traumatic experiences that may not always be proximal. Rather, the effects of early caretaker physical and sexual abuse continue to be a major risk factor even when the adolescent is on the streets.

In summary, although we express legitimate international concern for children trapped in war zones throughout the world, we should also consider the estimated 500,000 children (House Committee on Education and Labor, 1984; Office of Juvenile Delinquency Prevention: Missing, Abducted, Runaway, and Throwaway Children in America, 1990) who face serious risk for trauma daily on the streets of our cities. These data provide what we believe are conservative estimates of trauma and PTSD among runaways because they are from small to medium-sized Midwestern cities and may not include high percentages of traveling runaways who tend to congregate in "magnet" cities such as Los Angeles, New York, San Francisco, and New Orleans. The developmental trajectories of these seriously harmed young people are uncertain, but undoubtedly they will require a significant share of professional resources as they move into adulthood.

References

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (rev. 3rd ed.). Washington, DC: APA.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: APA.

Breslau, N., Davis, G., Andreski, P., & Peterson, E. (1991). Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Archives of General Psychiatry,* 48, 216-222.

Buckner, J., & Bassuk, E. (1997). Mental disorders and service utilization among youths from homeless and low-income housed families. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 890-900.

Burt, M. R. (1996). *Practical methods for counting homeless people: A manual for state and local jurisdictions* (2nd ed.). Washington, DC: Urban Institute.

Cauce, A., Paradise, M., Ginzler, J., Embry, L., Morgan, C., Lohr, Y., & Theofelis, J. (2000). The characteristics and mental health of homeless adolescents: Age and gender differences. *Journal of Emotional and Behavioral Disorders,* 8, 220-239.

Cochran, S., Greer, J., & Mays, V. (2003). Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the U.S. *Journal of Clinical and Consulting Psychology,* 71, 53-61.

Cochran, S., Stewart, A., Ginzler, J., & Cauce, A. (2002). Challenges faced by homeless GLB: Comparison of gay, lesbian, bisexual, and transgender adolescents with their heterosexual counterparts. *American Journal of Public Health,* 92, 773-777.

Feital, B., Margetson, N., Chamas, J., & Lipman, C. (1992). Psychosocial background and behavioral and emotional disorders of homeless and runaway youth. *Hospital & Community Psychiatry,* 43, 155-159.

Goodman, L., Saxe, L., & Harvey, M. (1991). Homeless as psychological trauma. *American Psychologist*, 46, 1219-1225.

Hagan, J., & McCarthy, B. (1997). *Mean streets: Youth crime and homelessness.* New York: Cambridge University Press.

House Committee on Education and Labor, Subcommittee on Human Resources. Juvenile Justice, Runaway Youth, and Missing Children's Act, amendments, 98th Cong., 2nd Sess., March 7 (1984).

Hoyt, D., Ryan, K., & Cauce, A. (1999). Personal victimization in a high risk environment: Homeless and runaway adolescents. *Research in Crime and Delinquency,* 36, 371-391.

Janus, M., Burgess, A., & McCormack, A. (1987). Histories of sexual abuse in adolescent male runaways. *Adolescence*, 22, 405-417.

Jenson, P., Roper, M., Fisher, P., Piacentini, J., Camino, G., Richters, J., et al. (1995). Test-retest reliability of the Diagnostic Interview Schedule for Children (DISC.2.1). *Archives of General Psychiatry,* 52, 67-71.

Kessler R. (1994a). Building on the ECA: The National Comorbidity Survey and the children's ECA. *International Journal of Methods for Psychiatric Research*, 4, 81-94.

Kessler R. (1994b). The National Comorbidity Survey of the United States. *International Review of Psychiatry,* 6, 365-376.

Kessler, R., McGonagle, K., Zhao, S., Nelson, C., Hughes, M., & Schlerman, S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Archives of General Psychiatry,* 51, 8-19.

Kessler, R., Sonnega, R., Bromet, E., Hughes, M., & Nelson, C. (1995). Posttraumatic stress disorder in the National Comorbidity Study. *Archives of General Psychiatry,* 52, 1048-1060.

Kilpatrick, D., Ruggerio, K., Acierno, R., Saunders, B., Resnick, H., & Best, C. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and Comorbidity: Results from a national survey of adolescents. *Journal of Consulting and Clinical Psychology,* 71, 692-700.

Kipke, M., Simon, T, Montgomery, S., Unger, J., & Iverson, E. (1997). Homeless youth and their exposure to and involvement in violence while living on the streets. *Journal of Adolescent Health,* 20, 360-367.

Koegel, P. Burnam, M., & Morton, J. (1996). Enumerating homeless people: Alternative strategies and their consequences. *Evaluation Research*, 20, 378-403.

Kufeldt, K., & Nimmo, M. (1987). Youth on the street: Abuse and neglect in the eighties. *Child Abuse and Neglect,* 11, 531-543.

McCaskill, P., Toro, P., & Wolfe, S. (1998). Homeless and matched housed adolescents: A comparative study of psychopathology. *Journal of Clinical Child Psychology,* 27, 306-319.

Mundy, P., Robertson, M., Robertson, J., & Greenblatt, M. (1990). The prevalence of psychotic symptoms in homeless adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry,* 29, 176-181.

Office of Juvenile Justice Delinquency Prevention: Missing, Abducted, Runaway and Throwaway Children in America. (1990). *First report: Numbers and characteristics, national incidence studies*. Washington, DC: OJJDP, U.S. Department of Justice.

Resnick, H., Kilpatrick, D., Dansky, B., Saunders, B., & Best, C. (1993). Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of Consulting and Clinical Psychology,* 61, 984-991.

Shaffer, D., Schwab-Stone, M., Fisher, P., Cohen, P., Piacentini, J., Davies, et al., (1993). The Diagnostic Interview Schedule for Children-Revised Version (DISC-R): I. Preparation, field testing,-interrater reliability, and acceptability. *Journal of the American Academy of Child and Adolescent Psychiatry,* 32, 643-650.

Sullivan, P., & Knutson, J. (2000). The prevalence of disabilities and maltreatment among runaway children. *Child Abuse and Neglect,* 24, 1275-1288.

Tyler, K., Hoyt, D., Whitbeck, L., & Cauce, A. (2001). The impact of childhood sexual abuse on later sexual victimization among runaway youth. *Journal of Research on Adolescence,* 11, 151-176.

U.S. Department of Health and Human Services. (2001). Title 45, Part 46, Public Welfare, Code of Federal Regulations.

Whitbeck, L., Chen, X., Hoyt, D., Tyler, K., & Johnson, K. (2004). Mental disorder, subsistence strategies, and victimization among gay, lesbian, and bisexual homeless and runaway adolescents. *Journal of Sex Research,* 41, 329-342.

Whitbeck, L., & Hoyt, D. (1999). *Nowhere to grow: Homeless and runaway adolescents and their families.* New York: Aldine de Gruyter.

Whitbeck, L., Hoyt, D., & Ackley, K. (1997). Abusive family backgrounds and later victimization among runaway and homeless adolescents. *Journal of Research on Adolescence,* 7, 375-392.

Whitbeck, L., Hoyt, D., &Yoder, K. (1999). A risk amplification model of victimization and depressive symptoms among runaway and homeless adolescents. *American Journal of Community Psychology, 27*, 292-298.

Whitbeck, L., Johnson, K., Hoyt, D., & Cauce, A. (2004). Mental disorder and comorbidity among runaway and homeless adolescents. *Journal of Adolescent Health,* 35, 132-140.

Wittchen, H. (1994). Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. *Journal of Psychiatric Research,* 28, 57-84.

World Health Organization. (1990). *Composite International Diagnostic* Interview (CIDI). Version 1.0. Geneva: WHO.

Acknowledgments

This research was funded by the National Institute of Mental Health (MH 57110), Les Whitbeck, principal investigator.

Corresponding author

Les B. Whitbeck, PhD, University of Nebraska-Lincoln, Department of Sociology, 739 Oldfather Hall, Lincoln, NE 68588-0324; lwhitbeck2@unlnotes.unl.edu