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Prevalence and Mental Health Outcomes of Homicide Survivors in a Representative U.S. Sample of Adolescents: Data from the 2005 National Survey of Adolescents

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Abstract

Background—Each homicide leaves behind several friends and family members, or homicide survivors. However, limited information is available on the impact of homicide on adolescent survivors. The purpose of the current study was to identify the prevalence of homicide survivorship and to determine mental health outcomes within a sample of U.S. adolescent survivors.

Methods—A nationally representative sample of American adolescents ($N=3,614$) between the ages of 12–17 completed structured telephone interviews assessing homicide survivorship and mental health consequences including posttraumatic stress disorder (PTSD), depression, drug use, and alcohol abuse.

Results—Reported prevalence within this sample of losing a loved one to criminal homicide was 9%, losing a loved one to vehicular homicide was 7%, and losing a loved one to both types of homicide was 2%. Logistic regression analyses found that adolescents who reported being homicide survivors were significantly more likely to report depression, drug use, and alcohol abuse after controlling for demographic factors and other violence exposure.

Conclusions—If the results from this study are generalizable to the US population, roughly 1 in 5 American adolescents may be impacted by homicide. Further, adolescents exposed to such a loss are at increased risk for mental health sequelae. Results suggest that greater attention needs to be paid to address the needs of these often underserved victims.

Keywords

homicide survivors; adolescents; mental health; prevalence; PTSD; depression

An estimated 16,692 people were victims of homicide in the United States in 2005 (Federal Bureau of Investigation, 2006). Homicide is of interest not only because of its severity but also because of the potential number of people who are affected by this particular crime. It is estimated that each homicide leaves behind 7 to 10 close relatives, in addition to friends, neighbors, and coworkers (Redmond, 1989). By the time an individual has reached adolescence, it is likely that he or she has been exposed to the death of a friend or family

member (Morin & Welsh, 1996; Rheingold et al., 2004). However, it is unknown the number of adolescents specifically impacted by the homicide of a loved one.

Most research on adolescent loss has focused on the adolescents' grief and bereavement over the loss of family members (e.g., Dowdney, 2000; Rheingold et al., 2004) and peers (McNeil, Sillimon, & Swihart, 1991; Ringler & Hayden, 2000) to any type of death. Adolescents reporting an unspecified death of a friend were at greater risk for developing posttraumatic stress disorder (PTSD), major depression, and substance use problems (e.g., Rheingold et al., 2004). After controlling for demographic variables and prior trauma history, however, substance use problems was the only remaining outcome related to past-year death of a friend. Little is known about the unique experiences of losing a loved one to homicide in adolescence. The effects of losing a loved one to homicide may resemble the experiences of other types of trauma victims, including guilt, anxiety over encountering reminders of the event, and negative and intrusive thoughts. In addition, homicide survivors contend with economic stressors, intrusion of the media and justice systems, stigmatization, thoughts of revenge, and strained relationships with family members (Hertz, Prothrow-Stith, & Chery, 2005). Therefore, losing a loved one to homicide may have a significant impact on adolescents' emotional well-being.

Studies on homicide survivorship¹ suggest these individuals experience a wide array of adverse mental health symptoms as a result of losing their loved ones (e.g., Amick-McMullan, Kilpatrick, & Resnick, 1991; Murphy et al., 2003; Parkes, 1993; Thompson, Norris, & Ruback, 1998). For example, Amick-McMullen Kilpatrick, and Resnick (1991) reported that 23% of the adult homicide survivors in their U.S. sample developed PTSD. Zinzow and colleagues (2009) report on a nationally representative U.S. sample of young adults found that homicide survivors (criminal and vehicular) were significantly more likely to report past year posttraumatic stress symptoms, depression, and drug abuse/dependence compared to nonvictims even after controlling for demographic variables and other victimizations. Researchers have found that child and adolescent survivors of homicide often experience severe symptoms of PTSD and other psychiatric problems because of the violent nature of the death (e.g., Clements & Burgess, 2002; Nader, Pynoos, Fairbanks, & Frederick, 1990). For example, Freeman, Shaffer, & Smith (1996) examined mental health correlates among fifteen African American and Latino youth homicide survivors, and their nonhomicide survivor counterparts. Homicide survivors were more likely to meet criteria for depression, anxiety, and PTSD.

To date, limited data are available regarding relations between homicide survivorship and risk for developing PTSD, depression, and substance abuse, beyond other risk factors such as demographic variables and prior trauma history among an adolescent population. Given the frequent co-occurrence of traumatic events, it is important to disentangle the effects of homicide survivorship from other potentially traumatic experiences. Moreover, no known studies have examined the prevalence of homicide survivorship and its psychiatric correlates in representative samples of U.S. adolescent survivors and non-victims.

The current study had three primary aims: 1) to determine the prevalence, demographic distribution, and characteristics of homicide survivorship (for both criminal homicide and vehicular homicide) among a U.S. national sample of adolescents, 2) to evaluate demographic differences between homicide survivors and the general population, and 3) to determine whether losing a loved one to homicide serves as a unique predictor of psychiatric

¹Numerous terms have been used to define those family members and friends who survive murder victims (including victims of drunk driving fatalities or vehicular homicide) such as "co-victims," "secondary victims," and "homicide survivors." For the purpose of this paper we will use the term "homicide survivors."

symptoms (specifically PTSD, depression, drug use, and alcohol abuse), above and beyond the contributions of other risk factors (demographic factors and prior trauma history).

Method

Participants

The full sample consisted of a 2005 U.S. national household probability sample in addition to an oversample of urban-dwelling youth aged 12 to 17 years to more accurately match U.S. population demographics. Sampling methodology and data collection procedures were similar to the previous National Survey of Adolescents (see Kilpatrick et al., 2000). In 6,694 households, a parent interview was completed and at least one eligible adolescent was identified. Of these, 1,268 (18.9%) parents refused adolescent participation. In an additional 188 cases (2.8%), the parent consented but the adolescent refused to be interviewed; and in another 119 (1.8%) cases the adolescent initiated but did not complete the interview. Finally, in 1,505 cases (22.5%) the parent consented and completed the parent interview but the identified eligible adolescent was either unreachable after 20 callbacks or was not pursued further due to the study having reached the sample quota of 3,600 participants. The remaining 3,614 cases (54.0%) resulted in completed parent and adolescent interviews. This included 2,459 adolescents in the national cross section and 1,155 urban-dwelling adolescents from the oversample. All variables for the current study, except family income, were derived from the adolescent interview.

Completers and non-completers were compared on demographic variables, including child age, child gender, household size, geographic stratum, race/ethnicity, parent marital status, parent employment status, household income, parent gender, and parent education. Adolescent completers were older ($M = 14.6$ years, $SD = 1.7$) than non-completers ($M = 14.5$ years, $SD = 1.7$; $t(6691) = 3.65$, $p < .01$). Completers were more likely than non-completers to report lower household income ($\chi^2 = 16.36$ (2, $N = 6031$), $p < .01$). Among completers, the parent completing the parent interview was more likely to be female (72%), in comparison to non-completers (67%; $\chi^2 = 19.10$ (1, $N = 6694$), $p < .01$). Child gender was also more likely to be female among completers (49.9%), in comparison to non-completers (47.2%; $\chi^2 = 4.69$ (1, $N = 6680$), $p < .05$). Finally, completers were more likely to report living in a large city or town in comparison to non-completers ($\chi^2 = 11.77$ (4, $N = 6594$), $p < .05$). No other comparisons were significant. Further, comparisons that were significant were very small (e.g., average age difference between completers and non-completers was only 0.1 years), and probably not clinically meaningful.

Measures

The measures used in this study (the 2005 National Survey of Adolescents-Replication study) were based on an interview module used for the original 1995 National Survey of Adolescents (NSA).

Risk- and protective-factor variables—Race and ethnicity were assessed using standard questions employed by the U.S. Bureau of the Census (1988). Four dummy-coded variables were created to represent each of the following groups: African American, non-Hispanic ($n = 464$, 12.8%); Asian American, non-Hispanic ($n = 90$, 2.5%); Hispanic ($n = 373$, 10.3%); and Native American ($n = 89$, 2.5%). Caucasian, non-Hispanic participants ($n = 2488$, 68.8%) served as the reference group. Participants chose from one of ten categories to reflect their estimated household income. These categories were collapsed to create a dichotomous variable to represent poverty (household income less than \$15,000; $n = 281$, 7.8%). Gender was coded “0” for male ($n = 1851$, 51.2%) and “1” for female ($n = 1763$, 48.8%). Age at time of interview was also assessed.

Interpersonal violence history was assessed using a module based on the Trauma Assessment for Adults, a widely used screening instrument that has been used to assess trauma history among community, medical, and adolescent populations in face-to-face and telephone interviews (Kilpatrick et al. 2000; Kilpatrick et al., 2003; Resnick 1996). Validity of this measure has been supported through high correspondence with other structured assessments of potentially traumatic events, as well as consistency with stressor events recorded in archival records of adult mental health patients (Saunders, Kilpatrick, Resnick, & Tidwell, 1989). Interpersonal violence history was assessed using behaviorally specific questions regarding three types of events (physical assault, physical abuse, and sexual assault). A continuous variable was created based on the number of events endorsed by the participant. Physical assault was defined as: (a) experiencing an attack with or without a weapon in which the participant was badly injured or beaten up; and/or (b) being threatened with a dangerous weapon (i.e., gun or knife). Physical abuse was defined as having an adult or caregiver (a) throw the participant across the room or against a hard surface, (b) beat, hit, or kick, and/or (c) choke the participant. Sexual assault was defined as: (a) forced anal, vaginal, and/or oral sex; (b) forced digital penetration and/or foreign object penetration; and/or (c) forced touching of genitals. These behaviorally specific questions have been reliably used in prior epidemiological studies to assess traumatic event exposure in adolescents (e.g., Kilpatrick et al., 2000).

Survivor of homicide—The loss of a friend or family member to criminal homicide was assessed by the following question: “During your lifetime, has there ever been an incident during which a member of your family or a friend who was very close to you was killed or murdered by some other person?” The loss of a friend or family member to vehicular homicide was assessed by the following question: “Has someone in your family or a friend who was very close to you ever been killed by a drunk driver?” Participants were also asked to describe their relationship to the victim, and their responses were coded into one of 8 categories. These categories were condensed into 3 categories for the purpose of this study: immediate family members, close friends, and other close relatives.

PTSD—Current (i.e., past six months) PTSD was assessed using the PTSD module of the National Women’s Survey (NWS; Kilpatrick, Resnick, Saunders, & Best, 1989), a structured diagnostic interview that assessed each *DSM-IV* symptom with a yes/no response. Prior studies have supported the concurrent validity and reliability of this measure with adolescents (e.g., temporal stability, internal consistency, diagnostic reliability; Kilpatrick et al., 2003; McCart et al., 2011; Ruggiero et al., 2006).

Major depressive episode (MDE)—*MDE* was assessed using the Depression Module of the NWS survey, a structured interview based on MDE criteria using a yes/no response format for each *DSM-IV* symptom for the prior 6 months. Participants were classified as experiencing MDE in the current study if they met past 6 month *DSM-IV* criteria. The internal consistency (Cronbach’s $\alpha = .85$) and convergent validity of the Depression module has been established in a prior epidemiological study with adolescents and with this sample (Kilpatrick et al., 2003; Kofler et al, 2011).

Drug Use (DU)—Several items assessed past year non-experimental substance use. The threshold for meeting criteria for DU was use of drugs non-medically on four or more occasions, consistent with the psychometrically supported approach we have used elsewhere with adolescents (Kilpatrick et al., 2000, 2003). The assessment of drug use problems targeted a range of substances (e.g., alcohol, tranquilizers, sedatives, amphetamines, opioids, steroids, marijuana, cocaine, hallucinogens, inhalants, and club drugs, such as MDMA,

GHB, Ketamine, Rohypnol). A 12-month time span was used for substance use items for the purpose of ensuring consistency with DSM-IV requirements.

Alcohol Abuse (AA)—Several items assessed DSM-IV criteria for past year alcohol abuse. Participants were categorized as having alcohol abuse if they endorsed any one of five questions that paralleled the four *DSM-IV* symptom categories of functional impairment for abuse, thus meeting *DSM-IV* Criterion A for alcohol abuse.

Procedure

Participants were selected using a multi-stage, stratified, random-digit dial procedure within each region of the United States. Respondents took an average of 43 minutes to complete the structured telephone interview. The interview was administered by trained interviewers at a survey research firm, Shulman, Ronca, and Bucuvalas, Inc. A computer-assisted telephone interview system prompted interviewers with each question consecutively on a computer screen, and supervisors conducted random checks of data entry accuracy and interviewers' adherence to assessment procedures. Parental and adolescent informed consent was obtained prior to the interview and participants received \$10 for completion. A university Institutional Review Board approved all study procedures.

Statistical Analysis

Descriptive analyses yielded population prevalence estimates for homicide survivorship. Chi-square analyses were used to compare criminal homicide survivors, vehicular homicide survivors, and non-victims on demographic variables and mental health outcomes. Given that differences were found between types of homicide survivorship, homicide survivorship was separated out in the final regression analyses. Four multivariate logistic regressions were conducted to examine whether reported homicide survivorship would predict PTSD, MDE, AA, and DU beyond the contribution of other potential risk factors. Control variables included the dummy coded racial/ethnic groups (i.e., African American, Hispanic, Asian, and Native American, with Caucasian, non-Hispanic as the reference group); age; gender; income; and violence history. Data were weighted according to 2004 U.S. Census estimates on geographic stratum, age, race, and gender.

Results

Prevalence Rates of Homicide Survivorship

In all, 18% of adolescents surveyed reported homicides of family or friends, which equates close to 1 in 5 adolescents. In Approximately 9% of adolescents in this sample reported being a survivor of criminal homicide, 7% of adolescents reported being a survivor of vehicular homicide, and 2% of adolescents reported experiencing both types of loss. Specifically, close to 1 in 10 adolescents were criminal homicide survivors and 1 in 14 adolescents were vehicular homicide survivors.

Demographic Comparisons

Most survivors reported they had lost either a close friend (53%) or non-immediate family member (i.e., cousin, aunt, uncle; 42%). Criminal homicide survivors significantly differed from vehicular homicide survivors regarding relationship to the victim, with the percentage of those who reported to have lost an immediate family member being seven times higher among criminal homicide survivors (7% vs. 1%). Table 1 provides a breakdown between criminal and vehicular homicide survivors across demographic characteristics.

Chi-square analyses revealed significant differences among criminal homicide survivors, vehicular homicide survivors, and non-victims (see Table 1). For significant comparisons, post hoc pairwise comparisons were conducted to understand the nature of the differences between groups. To correct for familywise error, a Bonferroni correction was applied and only comparisons differing at $p < .005$ were considered significant. A higher proportion of those who reported to be criminal homicide survivors identified as African American (33%) in comparison to non-victims (11%; $\chi^2 [1, N = 3266] = 109.52, p < .001$) and vehicular homicide survivors (6%; $\chi^2 [1, N = 648] = 53.58, p < .001$). Criminal homicide survivors were also more likely to identify as Hispanic in comparison to non-victims (16% of criminal homicide, 10% of non-victims; $\chi^2 [1, N = 3266] = 11.01, p < .005$). Homicide survivors were more likely than non-victims to be female (54% of criminal homicide, 59% of vehicular homicide, 64% of both, and 47% of non-victims ($\chi^2 [3, N = 3616] = 26.71, p < .001$). Further, criminal homicide survivors were more likely to report a lower income (13% reported income $< \$15,000$) than non-victims (8%; $\chi^2 [1, N = 3007] = 15.66, p < .005$) and vehicular homicide survivors (5%; $\chi^2 [1, N = 607] = 11.06, p < .005$). Homicide survivors were slightly older than non-victims at the time of assessment (14.8 years vs. 14.4 years; $F (1, 3612) = 31.47, p < .001$). They also reported a greater number of violent events than non-victims (0.67 vs. 0.28; $F (1, 3568) = 182.11, p < .001$).

Mental Health Outcomes

This study examines reported homicide survivorship in relation to four outcomes: Past 6 month PTSD, Past 6-month MDE, past year DU, and past year AA. Approximately 6% of reported criminal survivors, 7% of vehicular survivors, and 9% of survivors endorsing both forms of homicide reported current PTSD, which was greater than the frequency of PTSD among non-victims (3%). However, homicide survivorship was not significant in predicting PTSD, beyond the contribution of demographic characteristics and other violence history. A greater percentage of participants reporting both forms of homicide and vehicular homicide met criteria for past 6 month MDE, in comparison to criminal homicide survivors (12% of vehicular; 20% of both; 8% of criminal). Similarly, adolescents who reportedly lost a loved one to vehicular homicide or both types of homicide were at greater risk than non-victims for reporting past six month depression, after controlling for demographic variables and other violence history (OR = 1.69 and OR = 4.74, respectively; see Tables 1–2).

All homicide groups exhibited similar prevalence of DU (14% of criminal; 16% of vehicular; 17% of both) and AA (10% of criminal; 13% of vehicular; 17% of both; Table 1). All forms of homicide survivorship predicted past year DU (OR = criminal: OR=1.77; vehicular: OR = 1.66; both: OR = 2.69), beyond the contributions of demographic factors and other violence exposure. All three types of survivorship predicted past year AA (criminal: OR=1.82; vehicular: OR = 1.81; both: OR = 5.07; see Table 3).

Discussion

This study offers a major contribution to the literature as no previous studies have examined both the prevalence and impact of homicide survivorship among a representative U.S. sample of adolescents. If results of this study are generalizable, based upon U.S. population estimates, we estimate that 4.6 million adolescents in the U.S. may have lost a family member or close friend to homicide. Results indicate that within our sample of adolescents, close to 1 in 5 adolescents have experienced the loss of a family member or friend to homicide (criminal or vehicular). This rate appears higher than rates reported by U.S. adult populations using similar assessment methodology (13%: Amick-McMullan, Kilpatrick, & Resnick, 1991; 15% Zinzow et al., 2009). This higher rate perhaps may be attributed to adolescents identifying with a larger social network of friends than do adults.

There appear to be demographic differences between adolescents who reported being survivors and those who were not exposed to homicide. African Americans and Hispanics were overrepresented among criminal homicide survivors. Zinzow and colleagues (2009) found similar demographic differences when comparing young adult survivors to general population estimates. Research on potential racial/ethnic differences and other demographic differences on outcomes among survivors may be useful to further assist in targeting services.

Interestingly, although the majority of survivors reported losing a friend or non-immediate family member, mental health outcomes were still significant. Overall, adolescent survivors were at greater risk for depression, substance use, and alcohol abuse even after controlling for exposure to other violent events. This lends support to the growing literature on the uniqueness of homicide survivorship (Murphy et al., 2003; Zinzow et al., 2009). Although the prevalence of PTSD was higher among homicide survivors in comparison to non-victims, homicide survivorship did not predict PTSD within a multivariate model. Odds ratios suggested that homicide survivors were more likely than non-victims to meet criteria for PTSD, but the low base rate of this disorder could have limited our power to detect these effects. Furthermore, the inclusion of other violence history may have accounted for a large portion of the symptom variance in this population, given the increased likelihood of violence history among homicide survivors. Slightly varied results were noted among type of survivorship and mental health outcomes. Vehicular homicide, but not criminal homicide, was related to depression. In addition, it appears that being exposed to both types of loss places adolescents at further risk for depression, alcohol abuse, and drug use.

Significant mental health findings from this epidemiological study of adolescents offer implications for future research as well as clinical practice in the field of traumatic grief. First, given that the relationship to victims were typically friends and non-immediate family members, this study supports the idea that future research on homicide survivorship can maintain a broad definition of relationship to victim. Second, these rates and findings suggest a need for better assessment beyond loss of immediate family members when working with adolescents as exposure to homicide of those that live outside the home could still have a potential impact on adolescent well-being. Many victim services agencies are often limited to criminal justice related activities. Despite evidence of the significant distress experienced by adolescents and other family members of homicide victims, data from community based support programs that offer counseling suggest that very few (between 5 – 10%) of them request mental health counseling within the first year of bereavement (New & Berliner, 2000). Several interventions for traumatic grief reactions have been recently developed (e.g., Shear, Frank, Houck, & Reynolds, 2005) that address symptoms related to PTSD and depression. Adapting these interventions to adolescents would have potentially significant public health benefit.

Although this paper provides extrapolations to population estimates for prevalence of homicide survivorship, these extrapolations and the generalizability of results should be viewed with some caution given several significant limitations of the current sample. A survey study of adolescents requires parental consent; therefore, study participants were limited to those households that offered parental consent. Differences in adolescents that were consented from those who did not have parental or adolescent consent may impact generalizability of findings. For example, results from this sample may be an underestimate of true population estimates, as those with trauma histories may be less likely to participate in a survey that is assessing such histories. In addition, this study is a cross-sectional design, therefore hindering the ability to determine causal linkages between variables. Future studies should focus on the relationship between homicide loss and mental health outcomes within a longitudinal design to better predict psychopathology. Our definition of vehicular homicide

only included drunk driving and did not include other potential forms of vehicular homicide (e.g., reckless driving); therefore, vehicular homicide estimates may be an underestimate. The retrospective nature of the survey means that recall bias could have affected adolescents' report of prior traumatic events. This study did not assess for complicated bereavement symptoms. Recent research suggests that individuals who experience traumatic loss are at risk for developing a constellation of symptoms that make up "traumatic grief" or "complicated bereavement." (e.g., Melhem, 2004; Prigerson et al., 1996). Grief experts contend that complicated bereavement is a unique manifestation following the loss of a loved one in potentially traumatic circumstances. Further research is warranted among adolescents examining this type of grief response. Finally, relationships between survivorship and psychopathology such as PTSD may have not been detected due to statistical power issues associated with low base rate of exposure to both types of homicide survivorship.

Findings from this study highlight homicide survivorship estimates and correlated mental health outcomes among a U.S. sample of adolescents. Rates of both criminal and vehicular homicide may vary across countries, therefore impacting rates of reported survivorship between countries. For example, rates of intentional homicide in the U.S. are higher than most European countries which are closer to 1.5% but lower than many African and South American countries which are as high as 29% (Geneva Declaration, 2008; UNODC, 2009). Future research should include comparable data from other countries to better examine the global impact of homicide survivorship on adolescents as well as examine potential differences among societies in responding to loss of a family or friend by homicide.

In summary, previous research has not addressed the prevalence of homicide survivorship and its impact on adolescents. The present findings illustrate the magnitude of adolescents within the U.S. impacted by homicide. Further, results highlight the importance of assessing and addressing adolescents who have experienced the loss of a loved one to homicide as it increases risk for a number of chronic mental health problems. This is particularly the case for African American and Hispanic adolescents, who appear to be at heightened risk for homicide survivorship. Clinicians and other service providers need to be aware of these specific needs and stressors when tailoring interventions for those who have lost a loved one to homicide.

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Key Points

- Research has demonstrated that homicide survivorship is a unique stressor associated with adverse mental health outcomes among adults. However, little is known about its prevalence and effects among adolescents.
- The current study found the prevalence of homicide survivorship to be 18% in a U.S. national sample of adolescents.
- African American and Hispanic adolescents were over-represented among U.S. homicide survivors.
- Homicide survivors were at risk for depression, drug use, and alcohol abuse, even after controlling for demographic factors and other violence exposure.
- Results highlight the need for awareness, assessment, and treatment of the significant mental health needs of homicide survivors within clinical and criminal justice settings.

Table 1
Comparisons between homicide survivors and non-victims on demographic characteristics and mental health outcomes

Demographic Characteristics	Any Homicide (N = 669) % (n)	Criminal Homicide (n = 333) % (n)	Vehicular Homicide (n = 248) % (n)	Both C+V Homicide (n = 88) % (n)	Non-Victim (N = 2946) % (n)	χ^2
Relationship to Victim						25.44***
Immediate family member	5 (28)	8 (22) ^a	1 (2) ^b	5 (4) ^{ab}		12.17**
Close friend	53 (298)	44 (121) ^a	63 (129) ^b	58 (49) ^{ab}		18.75***
Other close relative	42 (237)	48 (133) ^a	35 (72) ^b	38 (32) ^{ab}		8.34*
Race/Ethnicity						171.17***
Caucasian	59 (384)	47 (153) ^a	75 (177) ^b	63 (54) ^{ab}	74 (2104) ^b	106.17***
African American	22 (139)	33 (108) ^a	6 (14) ^b	20 (17) ^{ac}	11 (325) ^{bc}	135.09***
Hispanic	15 (95)	16 (51) ^{ab}	14 (33) ^{bc}	13 (11) ^{abc}	10 (278) ^{bc}	14.10**
Native American	3 (22)	3 (9)	4 (10)	5 (4)	2 (67)	4.64
Asian American	1 (9)	1 (5)	1 (3)	0 (0)	3 (81)	6.12
Female gender	57 (382)	54 (180) ^a	59 (147) ^a	64 (56) ^a	47 (1381) ^b	26.71***
Income <\$15,000	10 (62)	13 (38) ^a	5 (11) ^{bc}	16 (13) ^{ac}	8 (219) ^c	15.66**
PTSD	7 (47)	6 (20) ^a	7 (18) ^a	9 (8) ^{ab}	3 (91) ^b	23.86***
MDE	11 (74)	8 (26) ^a	12 (31) ^{ac}	20 (18) ^c	5 (150) ^d	54.95***
Drug Use	15 (103)	14 (48) ^a	16 (40) ^a	17 (15) ^a	7 (208) ^b	48.84***
Alcohol Abuse	12 (80)	10 (33) ^a	13 (32) ^a	17 (15) ^a	5 (141) ^b	55.85***

Note. "Both" refers to participants who endorsed both criminal and vehicular homicide survivorship. Chi-square analyses compared the following groups: criminal homicide, vehicular homicide, both, and non-victims. Frequencies with differing superscripts were significantly different at $p < .005$.

Table 2
Results of Logistic Regression Analyses Relating Homicide Survivorship to past 6 month PTSD and Major Depression

Predictor	W	PTSD			Depression		
		OR	CI (95%)	W	OR	CI (95%)	
Age	15.09	1.28***	1.13-1.45	17.93	1.24***	1.12-1.38	
Gender	12.54	2.08***	1.39-3.13	34.62	2.84***	2.00-4.01	
Income <\$15,000	0.89	1.34	0.72-2.47	1.86	0.65	0.35-1.21	
African American	0.21	1.14	0.66-1.96	0.01	1.03	0.63-1.67	
Hispanic	0.98	0.70	0.35-1.41	0.29	0.86	0.50-1.48	
Native American	0.15	0.76	0.19-3.06	3.55	2.10	0.97-4.56	
Asian	0.12	0.78	0.20-3.08	0.61	0.61	0.17-2.12	
Violence history	98.32	2.63***	2.18-3.20	132.21	2.67***	2.25-3.14	
Criminal Homicide	0.91	1.31	0.75-2.31	0.09	0.92	0.55-1.56	
Vehicular Homicide	1.83	1.52	0.83-2.79	4.38	1.69*	1.03-2.75	
Both Criminal and Vehicular Homicide	2.85	2.52	0.86-7.35	13.49	4.74***	2.01-10.87	

* $p < .05$

** $p < .01$

*** $p < .001$

Note. OR = odds ratio. CI = confidence interval. W = Wald's coefficient. Reference categories for predictor variables were as follows: gender: male; income: family income > \$15,000; racial/ethnic groups: Caucasian; homicide: no history of homicide survivorship

Table 3
Results of Logistic Regression Analyses Relating Homicide Survivorship to Past Year Drug Use and Alcohol Abuse

Predictor	Drug Use			Alcohol Abuse		
	W	OR	CI (95%)	W	OR	CI (95%)
Age	106.36	1.67***	1.51–1.84	69.61	1.61***	1.44–1.80
Gender	5.98	0.71*	0.54–0.93	0.09	0.95	0.70–1.30
Income <\$15,000	1.29	1.32	0.82–2.12	0.28	1.18	0.68–2.04
African American	11.78	0.41**	0.24–0.68	8.19	0.41**	0.22–0.76
Hispanic	0.00	1.00	0.65–1.54	1.90	1.38	0.87–2.18
Native American	11.97	3.15**	1.64–6.04	5.30	2.47*	1.14–5.35
Asian	0.51	0.69	0.25–1.89	0.03	0.90	0.31–2.65
Violence History	108.39	2.22***	1.91–2.58	66.43	2.00***	1.70–2.37
Criminal Homicide	7.17	1.77**	1.16–2.68	6.30	1.82*	1.14–2.92
Vehicular Homicide	5.05	1.66*	1.07–2.58	5.74	1.81*	1.11–2.96
Both Criminal and Vehicular Homicide	5.53	2.69*	1.18–6.14	14.01	5.07***	2.17–11.87

* $p < .05$

** $p < .01$

*** $p < .001$

Note. OR = odds ratio. CI = confidence interval. W = Wald's coefficient. Reference categories for predictor variables were as follows: gender: male; income: family income > \$15,000; racial/ethnic groups: Caucasian; homicide: no history of homicide survivorship