

# Early Physical Victimization is a Risk Factor for Posttraumatic Stress Disorder Symptoms Among Mississippi Police and Firefighter First Responders to Hurricane Katrina

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The goal of the current study was to examine the relationship between early physical victimization and long-term mental health outcomes in a sample of first responder police and firefighter personnel involved in the relief efforts after Hurricane Katrina. Participants included 441 Biloxi and Gulfport Police and Firefighters. One fifth of participants reported having experienced physical victimization before age 18. After controlling for age, relationship status, and disaster exposure, early physical victimization was modestly associated with symptoms of PTSD, peritraumatic dissociation, depression, and sleep problems. The results suggest that early physical victimization might be a risk factor for mental health problems in police and fire personnel responding to mass disaster, pointing to the importance of developing interventions to mitigate risk related to a history of physical victimization in first-responders.

*Keywords:* Hurricane Katrina, childhood physical victimization, PTSD, police, firefighters

In 2005, the United States experienced its worst natural disaster in recorded history when Hurricane Katrina Struck the Gulf Coast (Federal Emergency Management Agency, n.d.). The impact of Hurricane Katrina was compounded by flooding. Gulf Coast first responders were exposed to life threatening events over a long period, placing them at increased risk for negative mental health outcomes. Previous studies have shown that first responders demonstrate increased levels of Posttraumatic Stress Disorder (PTSD; e.g., Berger et al., 2011; Fullerton, Ursano, & Wang, 2004; Marmar, Weiss, Metzler, Ronfeldt, & Foreman, 1996; Marmar, Weiss, Metzler, Delucchi, Best, & Wentworth, 1999; Zimering, Gulliver,

Knight, Munroe, & Keane, 2006), depression (Gross et al., 2006; Evans, Giosan, Patt, Spielman, & Difede, 2006), and other problems such as alcohol use, panic disorder, and medical problems (Gross et al., 2006).

A substantial number of police officers and firefighters were involved in the relief efforts after Hurricane Katrina, and many of them developed symptoms of physical and mental illness, including PTSD and depression, subsequent to this mass disaster (Center for Disease Control, 2006). For example, among the 912 police officers and 525 firefighters surveyed by the Center for Disease Control shortly after the disaster, 19% of police officers and 22% of firefighters reported PTSD symptoms, and 26% of police officers and 27% of the firefighters reported symptoms of Major Depressive Disorder (Center for Disease Control, 2006).

Studies of trauma-exposed populations have identified risk factors that increase an individual's vulnerability to adverse psychological consequences after trauma. These include gender, age at the time of trauma, peritraumatic reactions, previous psychiatric history, childhood abuse, family psychiatric history, social support, and other factors (Brewin, Andrews, & Valentine, 2000; Inslicht et al., 2010; Kessler, Sonnega, Bromet, Hughes, Nelson, & Breslau, 1999; Marmar et al., 2006; Ozer, Best, Lipsey, & Weiss, 2003).

Among the various risk factors for negative mental health outcomes after trauma exposure, early adversity has been shown to be robustly associated with mood disorders, anxiety disorders, risk of suicide, alcohol and drug use, psychosis, and antisocial behavior and impulsivity (Bremner, Southwick, Johnson, Yehuda, & Char-

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ney, 1993; Dube, Anda, Felitti, Chapman, Williamson, & Giles, 2001; Fergusson, Boden, & Horwood, 2008; Foa & Riggs, 1993; Green et al., 2010; Kendler, Bulik, Silberg, Hettema, Myers, & Prescott, 2000; Kessler et al., 2010; Owens et al., 2009; Read, van Os, Morrison, & Ross, 2005; Spatz Widom, DuMont, & Czaja, 2007; Spatz Widom, Marmorstein, & White, 2006), although the association has not been ubiquitous and other factors, such as family environment, may confound the relationship (e.g., Rind, Tromovitch, & Bauserman, 1998).

Despite the suggested association between early adversity and posttrauma pathology, there is a relative paucity of research regarding whether childhood victimization may be related to the increased risk of mental health problems after exposure to natural disasters. To date, studies conducted with disaster-exposed populations suggest that overall previous trauma exposure is associated with increased risk of postdisaster psychopathology, including PTSD and depression (Acierno et al., 2007; Amstadter et al., 2009; Leck, Difede, Patt, Giosan, & Szkodny, 2002). Acierno and colleagues (2007) surveyed a large sample of hurricane-exposed individuals 6 and 9 months after the disaster and found that risk factors for postdisaster psychopathology varied across disorders but that a history of previous trauma exposure increased the risk of all negative outcomes, including PTSD and depression. Similarly, Amstadter et al. (2009) assessed the prevalence of PTSD, depression, and anxiety disorders in a Vietnamese sample after a typhoon and found that lifetime exposure to traumatic events increased the risk for posttyphoon psychopathology. However, both of the described studies tended to evaluate an overall exposure to potentially traumatic events and did not specifically examine the relationship between childhood and adolescent victimization and postdisaster mental health. Leck and colleagues (2002) assessed histories of childhood sexual abuse in a sample of male disaster workers after the September 11th terrorist attack. They found that 4.3% of participants reported being sexually abused as children. Those who endorsed early abuse were more likely to report higher symptoms of depression and PTSD.

To our knowledge, no studies have examined whether first-responders with a history of childhood and adolescent physical victimization are more likely to have higher psychiatric symptoms of PTSD and depression in the aftermath of responding to a mass disaster, compared with those without such a history. This study examines whether childhood and adolescent physical victimization is associated with worse long-term mental health outcomes among police and firefighter personnel who responded to Hurricane Katrina, a large-scale natural disaster.

## Method

### Participants and Procedures

Participants from four Police and Fire Departments in Biloxi and Gulfport were contacted two years after the hurricane. Individuals were informed about the study during their Watch Command Meetings. Information about the study was given verbally and in written form. Study procedures were approved by the institutional review boards of the Mount Sinai School of Medicine and the University of California at San Francisco. The study was anonymous and, as an exempt protocol, written consent was not provided. The participation rate was 87% and included 441 Biloxi

and Gulfport Police and Firefighters (police  $n = 174$ ; firefighters  $n = 254$ ; information on occupation was not available for 13 participants). Four hundred six participants were male (92.1%), and 398 participants were White (90.2%). The study was planned working closely with the leadership of the departments. During planning, it became evident that there were relatively small numbers of women and minority group potential participants in these departments. This meant that reporting results by these categories would risk the confidentiality of potential participants in these groups. Consequently, we agreed not to report the data broken down by these categories. Given the paucity of studies on first responders exposed to disaster, and the importance of confidentiality as a tenet of conducting research, we agreed that this was a reasonable trade-off. The high response rates we obtained seem to have rewarded our decision.

### Measures

**Trauma exposure.** Childhood and adolescent physical victimization was assessed using the Trauma History Questionnaire (THQ; Green, 1996), which is a general measure of traumatic exposure. Only physical victimization up to age 18 was used for the purpose of this study, which was measured by the three items: "Has anyone, including family members or friends, ever attacked you with a gun, knife, or some other weapon?", "Has anyone, including family members or friends, ever attacked you without a weapon and seriously injured you?", "Has anyone in your family ever beaten, 'spanked,' or pushed you hard enough to cause injury?" We describe exposure to any of these three types of events as physical victimization. A single dichotomous score was computed for each participant as an indicator of an overall exposure to early physical victimization. Hurricane Katrina-related exposure was assessed with the Critical Incident Questionnaire (CIQ) adapted from the Incident Exposure Scale (Marmar, Weiss, Metzger, Ronfeldt, & Foreman, 1996). The CIQ includes 26 items (5-point Likert scale) and was developed to study the relationship between stress related symptomatology and exposure among first responders after the Loma Prieta Earthquake in the San Francisco Bay Area in 1989. Marmar et al. (1996) reported that the coefficient alpha for that measure was .83. In the current study, the measure is intended to tap into the multiple dimensions of the Hurricane Katrina disaster: Risk of personal injury or loss of life during the rescue operations; viewing or handling dead bodies and body parts; exposure to harshness of weather conditions; deprivation of food, sleep, and personal hygiene; and failure to receive clear communications from command center. The CIQ demonstrated adequate internal reliability in the current sample (Cronbach  $\alpha = .86$ ).

**Peri- and posttrauma reactions.** The Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997) was used to assess posttraumatic stress. The PDS includes 17 questions (4-point scale) that ask about posttraumatic symptoms over the preceding month, and several additional questions inquiring about the nature of traumatic exposure and functional impairment. Participants are asked to respond to the questions in relation to one critical incident from Hurricane Katrina that "has been the most troublesome, disturbing, and distressing." The Cronbach  $\alpha$  of the PDS in the current sample was .94. Beck Depression Inventory Second Edition (BDI-II; Beck, Steer, & Brown, 1996) was used to

assess depression. The BDI-II is a well-established measure that includes 21 items inquiring about the symptoms of depression (Cronbach  $\alpha = .94$ ). Sleep problems were measured with the Insomnia Severity Index (ISI; Morin, 1993), which is a 7-item self-report 5-point scale measure (Cronbach  $\alpha = .92$ ). To measure peri-traumatic reactions to an individual's most distressing Hurricane Katrina-related critical incident, we used the 10-item Peri-traumatic Dissociative Experiences Questionnaire (PDEQ; Marmar, Metzler, & Otte, 2004) and the 21-item Peritraumatic Distress Inventory (PDI; Brunet et al., 2001). The PDEQ assessed immediate dissociative responses to the critical incident and the PDI evaluated the subjective distress to the same incident at the time of the event or immediately after it. The Cronbach  $\alpha$ s for the PDEQ and PDI were .93 and .86, respectively.

## Results

Eighty-three participants (18.8%) reported exposure to childhood/adolescent physical victimization. Because of a severely skewed distribution of the physical victimization scores, a dichotomous score was used for the subsequent analyses. On the CIQ, the total sample reported an average of 2.68 ( $SD = .73$ ) Katrina-related potentially traumatic events.

The means and standard deviations of mental health outcomes by childhood/adolescent physical victimization are presented in Table 1. The results of the ANOVAs revealed that there were significant differences between those subjects who reported early traumatic exposure and those who did not on the PDS,  $F(1, 377) = 7.39, p = .007$ ; BDI-II,  $F(1, 409) = 12.02, p = .001$ ; ISI,  $F(1, 402) = 11.20, p = .001$ ; PDI,  $F(1, 376) = 5.41, p = .021$ ; and PDEQ,  $F(1, 156) = 7.29, p = .008$ . The results remained significant when corrected using a Bonferroni procedure for multiple comparisons.

We then conducted several multiple regression analyses to assess the unique contribution of early physical victimization to the variance in the PDS, BDI-II, ISI, PDI, and PDEQ scores. Every dependent variable, except the PDI, was transformed using log transformation because of non-normal distribution of those variables. To control for demographic variables, we assessed the relationship between age, relationship status, and the dependent variables. Age was significantly correlated with the PDS, PDI, and BDI-II ( $r = .12, p = .012$ ;  $r = .18, p = .001$ ;  $r = .12, p = .017$ , respectively), and we controlled for it in the first step of subsequent analyses. Relationship status showed a significant association with the PDEQ,  $F(1, 159) = 8.80, p = .003$ , and the BDI-II,  $F(1, 407) = 7.49, p = .006$ , and was controlled for in the first step of subsequent regression analyses with those variables. In addition,

we controlled for Hurricane Katrina-related exposure in the first step of all regression analyses.

In the second step, we added the dichotomous indicator of exposure to childhood/adolescent physical victimization to assess its individual contribution to the dependent variables. The results are presented in Table 2 and indicate that childhood/adolescent physical victimization was a significant statistical predictor of several mental health outcomes (i.e., PDS, BDI-II, ISI, and PDEQ), controlling for demographic variables and hurricane exposure. The resulting  $R^2$  changes were small but significant in the models with the PDS ( $\Delta R^2 = .03, p = .001$ ), BDI-II ( $\Delta R^2 = .01, p = .014$ ), ISI ( $\Delta R^2 = .02, p = .006$ ), and PDEQ ( $\Delta R^2 = .04, p = .009$ ).

## Discussion

The current study examined whether childhood/adolescent physical victimization was associated with increased rates of posttraumatic stress symptoms, depression, peritraumatic dissociation, and sleep problems, in a sample of police and firefighter personnel who were first-responders exposed to Hurricane Katrina. One fifth of participants (18.8%) reported having experienced physical victimization before age 18. Overall, the rates of victimization reported in this sample were somewhat lower than the rates obtained in community samples (MacMillan et al., 2001) and in military samples (Clancy et al., 2006; Zaidi & Foy, 1994), but comparable with those observed in a disaster sample by Leck and colleagues (2006). The observed rates of physical victimization in this study might be affected by underreporting and possibly by procedures used to screen first-responders. Our findings suggest that early physical victimization is not uncommon among police officers and firefighters, and that it is associated with worse mental health outcomes after serving as a first-responder in major natural disaster.

After controlling for age, relationship status and hurricane exposure, childhood/adolescent physical victimization showed small but significant associations with symptoms of PTSD, with peritraumatic dissociative experiences, with depression symptoms, and with sleep problems. These findings are consistent with those of Leck and colleagues (2006) that indicated that utility personnel working in a disaster environment, with histories of childhood sexual abuse, reported higher symptoms of PTSD and depression. Our study extends these previous findings to physical victimization, adding to our understanding of the relationship of those experiences and the mental health outcomes among police and firefighter first-responders.

The devastation related to Hurricane Katrina was associated with unique natural, institutional, and community stressors faced

Table 1  
*Mental Health Outcomes by Early Physical Victimization*

Physical victimization	PDS <i>M, SD</i>	BDI-II <i>M, SD</i>	ISI <i>M, SD</i>	PDI <i>M, SD</i>	PDEQ <i>M, SD</i>
Yes	8.81, 9.20	7.90, 9.53	6.60, 6.44	1.43, .57	1.93, .97
No	5.77, 8.68	4.72, 6.80	6.03, 6.13	1.24, .64	1.49, .71
Total sample	6.40, 8.86	5.34, 7.51	6.55, 6.27	1.28, .63	1.56, .78

Note. PDS = Posttraumatic Diagnostic Scale; BDI-II = Beck Depression Inventory Second Edition; ISI = Insomnia Severity Index; PDI = Peritraumatic Distress Index; PDEQ = Peritraumatic Dissociative Experiences Questionnaire.

Table 2  
Multiple Regression Predicting Mental Health Outcomes From Index and Past Trauma

Predictors	PDS			BDI-II			ISI			PDI			PDEQ		
	$\beta$	$R^2$	$\Delta R^2$												
Step 1	.12***			.08***			.05***			.25***			.21***		
Age	.12*			.11*			N/A			.20***			N/A		
Relationship status	N/A			-.13**			N/A			N/A			-.25**		
CIQ	.34***			.26***			.22***			.47***			.44***		
Step 2	.14***	.03**		.10***	.01*		.06***	.02**		.25***	.003		.24***	.04**	
Age	.12*			.10*			N/A			.20***			N/A		
Relationship status	N/A			-.13**			N/A			N/A			-.24**		
CIQ	.32***			.24***			.20***			.46***			.41***		
Physical victimization	.16**			.12*			.14**			.06			.19**		

Note. PDS = Posttraumatic Diagnostic Scale; BDI-II = Beck Depression Inventory Second Edition; ISI = Insomnia Severity Index; PDI = Peritraumatic Distress Index; PDEQ = Peritraumatic Dissociative Experiences Questionnaire.

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

by police and firefighters, including physical injuries, extended working hours, sleep deprivation, hostile communities, separation from families, and destruction of their homes (International Association of Fire Fighters, 2005). The association of early physical victimization and increased risk for symptomatology may have arisen specifically in the context of facing these challenges. Thus, it might be unique to first-responders to Hurricane Katrina and similar large-scale disasters. It may not generalize to first-responders involved in other types of disasters. Future studies are required to assess the generalizability of these findings.

The results of the current study should be interpreted with several limitations in mind. This is a cross-sectional study, and temporal and causal relationships cannot be drawn from its results. Future longitudinal studies should further clarify the relationships between early victimization and later adjustment to traumatic life events, including natural disasters among high-risk occupations. The current study relies on self-report data, and the sample included significantly more men than women, limiting the generalizability of the findings to both genders. Other forms of early traumatic exposure and maltreatment (e.g., childhood sexual abuse and neglect) that might play a role in long-term mental health outcomes were outside the scope of this study and were not controlled for. An additional limitation of this study is that we were not able to compare the mental health status of the participants pre- and postdisaster because the information about their adjustment before the hurricane was not available. Despite these limitations, the findings shed light on a risk factor associated with adverse mental health outcomes for first responders to disaster.

The findings highlight the importance of considering early victimization as well as adult traumatic exposure when considering prevention and intervention for first-responders involved in disaster recovery. Prevention programs designed to increase emotional resiliency, such as the Comprehensive Soldier Fitness Program (Casey, 2011; Lester, Harms, Herian, Krasikova, & Beal, 2011), and intervention models designed to treat PTSD (e.g., cognitive-behavioral therapy, cognitive processing therapy, exposure therapy) may be potentially useful building blocks to an integrated approach to mitigate the effects of serving as first responders.

## References

Acierno, R., Ruggiero, K., Galea, S., Resnick, H., Koenen, K., Roitzsch, J., de Arellano, M., Boyle, J., & Kilpatrick, D. (2007). Psychological

sequelae resulting from the 2004 Florida Hurricanes: Implications for postdisaster intervention. *American Journal of Public Health, 97*, 103–108. doi:10.2105/AJPH.2006.087007

Amstadter, A., Acierno, R., Richardson, L., Kilpatrick, D. G., Gros, D., Gaboury, M., . . . Galea, S. (2009). Post-typhoon prevalence of post-traumatic stress disorder, major depressive disorder, panic disorder and generalized anxiety disorder in a Vietnamese sample. *Journal of Traumatic Stress Studies, 22*, 180–188. doi:10.1002/jts.20404

Beck, A., Steer, R., & Brown, G. (1996). *Beck Depression Inventory—Second Edition manual*. San Antonio, TX: The Psychological Corporation.

Berger, W., Coutinho, E. S., Figueira, I., Marques-Portella, C., Luz, M. P., Neylan, T. C., . . . Mendlowicz, M. V. (2012). Rescuers at risk: A systematic review and meta-analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Social Psychiatry and Psychiatric Epidemiology*. doi:10.1007/s00127-011-0408-2

Bremner, J. D., Southwick, S., Johnson, D., Yehuda, R., & Charney, D. (1993). Childhood physical abuse and combat-related posttraumatic stress disorder in Vietnam veterans. *The American Journal of Psychiatry, 150*, 235–239.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*, 748–766. doi:10.1037/0022-006X.68.5.748

Brunet, A., Weiss, T., Metzler, S., Best, T., Neylan, C., Rogers, C., Fagan, J., & Marmar, C. (2001). The Peritraumatic Distress Inventory: A proposed measure of PTSD criterion A2. *The American Journal of Psychiatry, 158*, 1480–1485. doi:10.1176/appi.ajp.158.9.1480

Casey, G. W., Jr. (2011). Comprehensive soldier fitness: A vision for psychological resilience in the U.S. Army. *American Psychologist, 66*, 1–3. doi:10.1037/a0021930

Center for Disease Control. (2006). Health hazard evaluation of police officers and firefighters after Hurricane Katrina – New Orleans, Louisiana, October 17–28 and November 30–December 5, 2005. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5516a4.htm>

Clancy, C. P., Graybeal, A., Tompson, W. P., Badgett, K. S., Feldman, M. E., Calhoun, P. S., . . . Beckham, J. C. (2006). Lifetime trauma exposure in veterans with military-related posttraumatic stress disorder: Association with current symptomatology. *Journal of Clinical Psychiatry, 67*, 1346–1353. doi:10.4088/JCP.v67n0904

Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction and the risk of attempted suicide throughout the life span: Findings from Adverse Childhood Experiences Study. *JAMA: Journal of the American Medical Association, 286*, 3089–3096. doi:10.1001/jama.286.24.3089

- Evans, S., Giosan, C., Patt, I., Spielman, L., & Difede, J. (2006). Anger and its association to distress and social/occupational functioning in symptomatic disaster relief workers responding to the September 11, 2001, World Trade Center disaster. *Journal of Traumatic Stress, 19*, 147–152. doi:10.1002/jts.20107
- Federal Emergency Management Agency. (n.d.). Louisiana Recovery Office. Retrieved from <http://www.fema.gov/hazard/hurricane/2005katrina/index.shtml>
- Fergusson, D. M., Boden, J. M., & Horwood, L. J. (2008). Exposure to childhood sexual and physical abuse and adjustment in early adulthood. *Child Abuse & Neglect, 32*, 607–619. doi:10.1016/j.chiabu.2006.12.018
- Foa, E., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure for posttraumatic stress disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment, 9*, 445–451. doi:10.1037/1040-3590.9.4.445
- Foa, E., & Riggs, D. (1993). Posttraumatic stress disorder and rape. In J. M. Oldham, M. B. Riba, and A. Tasman (Eds.), *American psychiatric press review of psychiatry* (Vol. 12, pp. 273–303). Washington, DC, American Psychiatric Press.
- Fullerton, C. S., Ursano, R., & Wang, L. (2004). Acute stress disorder, posttraumatic stress disorder, and depression in disaster or rescue workers. *The American Journal of Psychiatry, 161*, 1370–1376. doi:10.1176/appi.ajp.161.8.1370
- Green, B. (1996). Trauma History Questionnaire. In B. H. Stamm (Ed.), *Measurement of stress, trauma, and adaptation* (pp. 366–369). Lutherville, MD: Sidran Press.
- Green, J. G., McLaughlin, K. A., Berglund, P. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood adversities and adult psychopathology in the National Comorbidity Survey Replication (NCS-R) I: Associations with first onset of DSM-IV disorders. *Archives of General Psychiatry, 67*, 113–123. doi:10.1001/archgenpsychiatry.2009.186
- Gross, R., Neria, Y., Tao, X. G., Massa, J., Ashwell, L., Davis, K., & Gevh, A. (2006). Posttraumatic stress disorder and other psychological sequelae among world trade center clean up and recovery workers. *Annals of the New York Academy of Sciences, 1071*, 495–499. doi:10.1196/annals.1364.051
- Inslicht, S. S., McCaslin, S. E., Metzler, T. J., Henn-Haase, C., Hart, S. L., Neylan, T. C., & Marmar, C. R. (2010). Family psychiatric history, peritraumatic reactivity, and posttraumatic stress symptoms: A prospective study of police. *Journal of Psychiatric Research, 44*, 22–31. doi:10.1016/j.jpsychires.2009.05.011
- International Association of Fire Fighters. Reports from the hurricane frontlines: Katrina 2005. Washington, DC: International Association of Fire Fighters; 2005. Retrieved from <http://daily.iaff.org/katrina/htm?c=report>
- Kendler, K. S., Bulik, C. M., Silberg, J., Hettema, J. M., Myers, J., & Prescott, C. A. (2000). Childhood sexual abuse and adult psychiatric and substance use disorders in women: An epidemiological and cotwin control analysis. *Archives of General Psychiatry, 57*, 953–959. doi:10.1001/archpsyc.57.10.953
- Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., . . . Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *The British Journal of Psychiatry, 197*, 378–385. doi:10.1192/bjp.bp.110.080499
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., Nelson, C. B., & Breslau, N. (1999). Epidemiological risk factors for trauma and PTSD. In R. Yehuda (Ed.) *Risk factors for Posttraumatic Stress Disorder*. (pp. 23–59). Washington, DC: American Psychiatric Press, Inc.
- Leck, P., Difede, J., Patt, I., Giosan, C., & Szkodny, L. (2002). Incidence of male childhood sexual abuse and psychological sequelae in disaster workers exposed to a terrorist attack. *International Journal of Emergency Mental Health, 8*, 267–274.
- Lester, P., Harms, P. D., Herian, M., Krasikova, D., & Beal, S. (2011). The longitudinal analysis of the impact of Master Resilience Training of self-reported resilience and psychological health data. *Wisconsin Department of Military Affairs*. Retrieved on April 30, 2012 from [dma.wi.gov/dma/news/2012news/csf-tech-report.pdf](http://dma.wi.gov/dma/news/2012news/csf-tech-report.pdf)
- MacMillan, H. L., Fleming, J., Streiner, D., Lin, E., Boyle, M., Janieson, E., . . . Bardslee, W. (2001). Childhood abuse and lifetime psychopathology in a community sample. *The American Journal of Psychiatry, 158*, 1878–1883. doi:10.1176/appi.ajp.158.11.1878
- Marmar, C., McCaslin, S., Metzler, T., Best, S., Weiss, D., Fagan, J., . . . Neylan, T. (2006). Predictors of posttraumatic stress in police and other first responders. *Annals of the New York Academy of Science, 1071*, 1–18.
- Marmar, C. R., Metzler, T. J., & Otte, C. (2004). The Peritraumatic Dissociative Experiences Questionnaire. In J. P. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD: A practitioner's handbook* (2nd ed., pp. 144–167). New York, NY: Guilford Press.
- Marmar, C. R., Weiss, D., Metzler, T., Delucchi, K., Best, S., & Wentworth, K. (1999). Longitudinal course and predictors of continuing distress following critical incident exposure in emergency services personnel. *Journal of Nervous and Mental Disease, 187*, 15–22. doi:10.1097/00005053-199901000-00004
- Marmar, C., Weiss, D., Metzler, T., Ronfeldt, H., & Foreman, C. (1996). Stress response of emergency services personnel to the Loma Prieta earthquake interstate 880 freeway collapse and control traumatic incidents. *Journal of Traumatic Stress, 9*, 63–85. doi:10.1002/jts.2490090107
- Morin, C. (1993). *Insomnia: Psychological assessment and management*. New York, NY: Guilford Press.
- Owens, G., Dashevsky, B., Chard, K., Mohamed, S., Haji, U., Heppner, P. S., & Baker, D. (2009). The relationship between childhood trauma, combat exposure, and Posttraumatic Stress Disorder in male veterans. *Military Psychology, 21*, 114–125. doi:10.1080/08995600802574530
- Ozer, E. J., Best, S., Lipsey, T., & Weiss, D. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin, 129*, 52–73. doi:10.1037/0033-2909.129.1.52
- Read, J., van Os, J., Morrison, A. P., & Ross, C. A. (2005). Childhood trauma, psychosis and schizophrenia: A literature review with theoretical and clinical implications. *Acta Psychiatrica Scandinavica, 112*, 330–350. doi:10.1111/j.1600-0447.2005.00634.x
- Rind, B., Tromovitch, P., & Bauserman, R. (1998). A meta-analytic examination of assumed properties of child sexual abuse using college samples. *Psychological Bulletin, 124*, 22–53. doi:10.1037/0033-2909.124.1.22
- Spatz Widom, C. S., DuMont, K. A., & Czaja, S. J. (2007). A prospective investigation of major depression disorder and comorbidity in abused and neglected children grown up. *Archives of General Psychiatry, 64*, 49–56. doi:10.1001/archpsyc.64.1.49
- Spatz Widom, C. S., Marmorstein, N. R., & White, H. R. (2006). Childhood victimization and illicit drug use in middle adulthood. *Psychology of Addictive Behaviors, 20*, 394–403. doi:10.1037/0893-164X.20.4.394
- Zaidi, L. Y., & Foy, D. W. (1994). Childhood abuse experiences and combat-related PTSD. *Journal of Traumatic Stress, 7*, 33–42. doi:10.1002/jts.2490070105
- Zimering, R., Gulliver, S., Knight, J., Munroe, J., & Keane, T. (2006). Posttraumatic stress disorder in disaster relief workers following direct and indirect trauma exposure to Ground Zero. *Journal of Traumatic Stress, 19*, 553–557. doi:10.1002/jts.20143

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