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Trauma and PTSD in Japan

This issue of the *PTSD Research Quarterly* is the third in an occasional series on the epidemiology of trauma and PTSD around the world, following previous issues on Latin America (Fall 2009) and the Middle East (Fall 2010). Whereas published reviews of epidemiologic studies focus primarily on North America, this series aims to highlight other relevant bodies of work. In this issue, I consider research conducted in a specific country, Japan, rather than in a region of the world. There are three reasons for this choice. First, Japan is a highly developed country with a strong research infrastructure, and thus a significant body of work has emerged that spans the range of trauma survivors, including the general population (multi-event studies) and victims of violence, automobile accidents, fire, natural disasters, terrorist attacks, and war. The area that is least well represented in the Japanese literature is military trauma, which follows from Japan's post-World War II history of having only a defensive force for many years. This bibliography is limited to English-language articles, but interested readers will find many additional Japanese-language articles (with English abstracts) indexed in PILOTS. For an historical perspective on traumatic stress studies in Japan, the single best source is Goto and Wilson (2003).

The second rationale for focusing specifically on Japan is that it has been the setting of several catastrophic or novel mass traumatic events. The greatest of these were the 1945 atomic bomb explosions in Hiroshima and Nagasaki. As the trauma field develops, we sometimes lose sight of the significance of early phenomenological studies that presaged our current understandings and

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definitions of PTSD; Lifton's (1967) study of Hiroshima was profoundly important in this regard. The list of events in Japan also includes one of the greatest earthquakes that has been studied by behavioral scientists, the 1995 Hanshin-Awaji earthquake in Kobe, which killed over 6,500 people and left more than 300,000 homeless, as well as the most significant example of bioterrorism in the world literature, the 1995 sarin gas attacks in Tokyo. Earlier this year, Japan experienced a 9.0 earthquake that triggered massive tsunami waves and a nuclear accident. Approximately 15,000 people died in this disaster, and hundreds of thousands of people were evacuated or displaced. Given this event, it seemed timely to visit the past literature on disasters in Japan to review what was found about their psychological effects.

Third, Japan is of interest because of its cultural distinctiveness. The role of culture in shaping either the phenomenology or epidemiology of PTSD in Japan was not analyzed very thoroughly in most of the work reviewed, but there were exceptions that provide some insight.

This guide to the literature is organized around these three primary themes. First, I summarize the literature on individually experienced events, such as accidents, injuries, and domestic violence. General-population studies are included here. Second, I summarize the literature on mass trauma, including the atomic bomb attacks, natural disasters, and the sarin gas attacks. Third, I consider what the Japanese literature potentially tells us about the role of culture in shaping the expression of PTSD.

Continued on page 2



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Trauma in the General Population of Japan

The most important epidemiologic data on trauma and PTSD in Japan were collected as part of the World Health Organization's World Mental Health Survey Initiative (Kawakami et al., 2008). In 2002-2004, representative samples of adults aged 20 and older in two cities and five towns were interviewed. The 12-month prevalence of PTSD (9 of 887 or 0.4%) was far lower than that found (3.5%) in the parallel U.S study (Kessler et al., 2005). Using data from the same survey, Fujiwara et al. (2011) reported population frequencies of various "childhood adversities," many of which would qualify as traumatic events, including parental death (11.5%), family violence (10.1%), physical abuse (7.5%), and sexual abuse (0.5%). Family violence and physical abuse both showed significant associations with mental illness, over and above the effects of other adversities such as parental mental illness, criminality, physical illness, and economic adversity. Thus, despite the low prevalence of PTSD, it does appear that trauma is a risk factor for mental illness in Japan, as it is elsewhere.

Similarly, Izutzu and colleagues (2008) studied lifetime trauma exposure in over 3,000 industrial workers. The 22% of the sample who reported one or more events exhibited higher depression and anxiety (measured by self-report) and a higher probability of sickness absence (confirmed in the company's human resources database) than did other workers. Events had their greatest impact in the first year, which is consistent with other literature in the trauma field.

Although few studies have focused specifically on interpersonal violence in Japan, Fujiwara et al. (2010) examined the influence of childhood abuse history and domestic violence on the mental health of 340 women housed in Mother-Child Homes. Citing other sources, the authors estimated that 14.3% of Japanese women experience domestic violence by age 30. Women in these homes were clearly at greater than average risk, with 84% having a history of domestic violence, 45% a history of child abuse, and 42% both. Child abuse was related to dissociative symptoms and depression, and both experiences were related to current traumatic stress. Domestic violence was related to dissociation only in women who had not experienced child abuse; the authors interpreted this effect to mean that abused women were already so distressed that domestic violence had little additional effect.

Motor vehicle accidents (MVAs) are an important source of trauma in Japan. In the Tachikawa Cohort Study (Matsuoka et al., 2008), 31 of 100 participants showed some form of new-onset psychiatric illness 4-6 weeks after the accident, including 8 full and 16 partial PTSD cases. The strongest predictors of PTSD were sense of life threat during the accident and heart rate and intrusive symptoms at the time of hospital intake. Eighteen months post-accident, Nishi, Matsuoka, and Kim (2010) found that posttraumatic growth in the Cohort was positively correlated with both sense of coherence (interpreted as a sign of coping success) and PTSD symptoms (interpreted as a sign of enduring distress). A similar study (Hamanaka et al., 2006) yielded similar results: 9% of the sample ($N = 100$) met full criteria for acute stress disorder (ASD) one month post-accident (plus 10% partial ASD), and 8.5% met full criteria for PTSD six months post-accident (plus 12.2% partial PTSD). The association between ASD and PTSD was quite strong when partial conditions were included. In another sample of MVA survivors

assessed 5 ($n = 93$) and 14 months ($n = 49$) post-accident, subjective measures of crash severity (life threat, persistent medical problems) were related to subsequent distress, whereas objective measures (e.g., change in velocity during impact) were not (Fujita & Nishida, 2008).

Mass Trauma in Japan

Some of these most significant contributions of the Japanese literature are related to critical events the country experienced in the 20th century. No single act of war before or since has been as catastrophic or deadly as the atomic bombings of Hiroshima and Nagasaki in 1945. Shigematsu (1998) provided a useful overview of 50 years of research supported by the foundation funded jointly by Japan and the United States. These studies addressed the long-term health consequences of radiation exposure based on biennial health examinations of 20,000 survivors and death certificate retrieval for a larger cohort of 120,000 survivors. This program of research was extremely important for documenting long-term risk for leukemia and other serious illnesses and for testing (and failing to find) evidence of heritable effects in offspring. Although, overall, the cohort's psychiatric status received little attention, Yamada and Izumi (2002) examined self-report data collected between 1962 and 1965 to estimate the prevalence of anxiety disorders. Peak prevalence (30-35%) occurred in men aged 25-40 and women aged 45-60. Likelihood of anxiety increased with more severe exposure (e.g., proximity to the epicenter) and presence of acute radiation symptoms. With great depth, Lifton (1967, 1970) documented Hiroshima's experience. He highlighted survivors' intense emotions surrounding their extreme confrontation with death, the subsequent numbing of these emotions, survivors' sense of shame, the clarity of particular seminal memories, survivors' ongoing bodily concerns wherein every minor illness triggered fear of dreaded disease, the cultural significance of their fears that offspring would be abnormal or die, and how survivors' self-image and social identity as *hibakusha* separated them from the rest of humankind.

A substantial body of work on postdisaster mental health includes studies of young children after a gas explosion (Ohmi et al., 2002), adolescents after an accident at sea (Maeda et al., 2009), and adults after volcano eruptions (Goto et al., 2002; Ohta et al., 2003) and earthquakes (Kuwabara et al., 2008). By far, the most extensively studied disaster was the 1995 Hanshin-Awaji earthquake in Kobe. The Kobe earthquake sparked significant advancement of PTSD research and treatment in Japan (Goto & Wilson, 2003; McCurry, 2004). Kato (1998) reported results from a large sample ($N = 6,217$) of residents of 100 temporary housing communities who were assessed with standardized measures of distress and PTSD. Percentages scoring above threshold on the PTSD measure ranged from 13% in the least exposed group to 25% in more highly exposed groups. Kwon, Maruyama, and Morimoto (2001) likewise demonstrated a strong relationship between severity of exposure and PTSD outcomes. Kato et al. (1996) studied age differences in a sample of 67 younger (< 60) and 75 older adults. Both groups showed distress at Week 3 but by Week 8, older adults had recovered more than younger adults. Fukuda et al. (1999) documented a strong association between health behavior (e.g., smoking, drinking, exercising) and PTSD symptoms in a sample of 108 men. The 26% of the sample whose "lifestyle" had worsened averaged 9 PTSD symptoms, compared to 5 symptoms in the remainder of the sample.

Perhaps the most unusual disaster occurred when members of a Japanese cult released sarin gas in the Tokyo subway system, killing 12 people and injuring over 5,000. One month post-attack, Ohbu et al. (1997) assessed 475 persons who had been admitted to St. Luke's International Hospital for acute sarin poisoning. The investigators did not measure PTSD but did assess relevant symptoms, including fear of the subway (32%), sleep disturbance (29%), flashbacks (16%), depressed mood (16%), and nightmares (10%). Sixty percent had at least one psychological symptom. Six months post-attack, Murata et al. (1997) evaluated the neurological functioning of 18 St. Luke patients and found no clinical abnormalities. Scores on the PTSD checklist ranged from 18-45 ($M = 26$) but were unrelated to variations in brain functioning (see Hoffman et al., 2007, for a more complete review of the neuropsychological research). Kawana, Ishimatsu, and Kanda (2001) followed St. Luke patients for many years. Rates of DSM-IV PTSD were 2.8%, 2.9%, and 2.1%, respectively, at 2, 3, and 5 years post-attacks, with an additional 7-8% partial PTSD at each time-point.

The Role of Japanese Culture

Most empirical studies summarized here did not explicitly consider the cross-cultural validity of the PTSD diagnosis, but Kawana and colleagues (2001) did show that prevalence rates based on revised Nakano criteria (12.4%, 9.7%, and 14.1%, respectively at 2, 3, and 5 years after the sarin gas attack) were higher than those obtained using DSM-IV criteria. Several studies (e.g., Fukunishi et al., 1996; Ohtani et al., 2004) included data on specific symptoms, and their relative frequencies were familiar, with certain symptoms (e.g., sleep disturbance, intrusive memories) being much more frequent than others (inability to recall aspects, restricted affect, estrangement), as is typically the case. In general, the Japanese literature showed relationships between variables (e.g., risk factors) that were consistent with other reports.

More broadly, this body of work did not give a great deal of attention to the role of culture, but there were exceptions. Throughout his narratives, Lifton (1967, 1970) considered how the social and psychological consequences of the atomic bombings were shaped by Japanese values surrounding patience, forbearance of hardship, and family. Goto and Wilson (2003) noted that Japanese culture discourages inappropriate public disclosure of emotion because of shame and norms regarding the ability to cope with stress. These values inhibit seeking help for psychological problems (Goto et al., 2002). As is true in many settings, physical symptoms are more readily recognized and acceptable than psychological symptoms. McCurry (2004) observed that Japan's traditions are changing towards a new openness about mental health problems. Indeed the field of traumatic stress studies has been growing in Japan and is likely to grow further still in response to the disaster of 2011.

References

Kessler, R.C., Chiu, W.T., Demler, O., & Walters, E.E. (2005). **Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication.** *Archives of General Psychiatry*, *62*, 617-709.

McCurry, J. (2004). **Japan makes progress in facing up to post-traumatic stress.** *Lancet*, *363*, 1782.

Fujiwara, T., Kawakami, N., & World Mental Health Japan Survey Group. (2011). **Association of childhood adversities with the first onset of mental disorders in Japan: Results from the World Mental Health Japan, 2002–2004.** *Journal of Psychiatric Research*, *45*, 481-487. doi: 10.1016/j.jpsychires.2010.08.002. It is well known that childhood adversities (CAs) are a significant risk factor for mental disorders in later life. However, it is uncertain whether a similar association between CAs and mental disorders can be found in Japan. Few studies have employed an appropriate statistical model that takes into account the high comorbidity of CAs. The purpose of this study is to elucidate the association between CAs and the onset of mental disorders in Japan. We used the data from the World Mental Health Japan, 2002–2004 ($n = 1722$). Respondents completed diagnostic interviews (the World Health Organization Composite International Diagnostic Interview) that assessed lifetime prevalence of 15 Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV) disorders. Associations of 12 retrospectively reported CAs with the lifetime prevalence of mental disorders were estimated using discrete-time survival analysis. Of the study sample, 32% reported as having experienced at least 1 CA during childhood. The studied CAs were highly comorbid. Parental mental illness showed significant sub-additive effects. The presence of 3 CAs showed a significant interactive effect on any mental health disorder. The number of CAs had a strong interactive effect on the onset of anxiety disorders. Predictive effects of CAs were found only among childhood onset mental disorders. It was confirmed that CAs are one of the predictors of the onset of DSM-IV mental disorders, especially during childhood, in Japan.

Goto, T., & Wilson, J.P. (2003). **A review of the history of traumatic stress studies in Japan: From traumatic neurosis to PTSD.** *Trauma, Violence, & Abuse*, *4*, 195-209. doi: 10.1177/1524838003004003001. Based on available literature, this review article investigates traumatic stress studies in Japan from the late 19th century to the present for English-speaking audiences. First, traumatic neuroses of war victims, A-bomb survivors, and victims of work-related accidents are discussed. Second, traumatic stress studies of victims of other manmade disasters, such as the sarin gas attacks in Tokyo, domestic violence, and burn injuries, are discussed. Third, psychological outcomes of natural disaster studies are discussed in relation to social support and help-seeking tendencies of Japan disaster victims.

Goto, T., Wilson, J.P., Kahana, B., & Slane, S. (2002). **PTSD, depression and help-seeking patterns following the Miyake Island volcanic eruption.** *International Journal of Emergency Mental Health*, *4*, 157-171. Assessing help-seeking patterns following disaster provides useful information about who needs professional help the most, who is willing to seek help, and who is reluctant to seek help. 231 Japanese evacuees from the Miyake Island volcanic eruption (2000) participated in this study (ages 20-93, average age 59.52). Ten months after the evacuation, participants were mailed questionnaires which elicited demographic data, disaster experiences, help-seeking patterns, and psychological symptoms (PTSD and depression). Help-seeking patterns were categorized as: professionals (physicians, nurses, psychotherapists/counselors, telephone consultation, social workers, priests and monks, and others); or informal (family, relatives, friends, neighbors, and others) and, (information, advice, tangible, and emotional). The findings indicate that younger and/or female victims frequently sought help from informal sources while male and/or older victims frequently sought help from professionals. Severity of PTSD and depression symptoms were positively correlated with help-seeking from physicians, but not psychologists or mental health professionals. Very high rates of utilizing medical assistance rather than mental health treatment were also identified among these disaster victims, and appeared related to cultural norms regarding shame and self-disclosure of emotional distress.

Hamanaka, S., Asukai, N., Kamijo, Y., Hatta, K., Kishimoto, J., & Miyaoka, H. (2006). **Acute stress disorder and posttraumatic stress disorder symptoms among patients severely injured in motor vehicle accidents in Japan.** *General Hospital Psychiatry*, *28*, 234-241. doi: 10.1016/j.genhosppsych.2006.02.007. Objective: The prevalence of acute stress disorder (ASD) and posttraumatic stress disorder (PTSD) in seriously injured survivors of motor vehicle accidents (MVAs) in Japan was investigated. Furthermore, predictive factors in the early stage for development of PTSD were evaluated. Method: Subjects were consecutive samples ($N=100$) of

patients hospitalized with severe MVA injuries surveyed at two time points: within 1 month after the MVA and then 6 months later. In the first survey, we conducted the Acute Stress Disorder Interview and compiled results of a self-rating questionnaire; in the second survey, we conducted a structured clinical interview via telephone. *Results:* The prevalence of ASD and PTSD were 9.0% and 8.5%, respectively. The shift from ASD to PTSD was more pronounced when we included partial diagnoses of ASD and PTSD. Three predictive factors for PTSD were identified through multiple logistic analysis: ASD-positive, presence of persistent physical disability, and physical injury severity. *Conclusions:* Even among severely injured MVA survivors, most acute stress symptoms subside over time. However, having ASD or partial ASD in the early stage, and the presence of physical disability as an aftereffect are strong predictive factors for PTSD. These findings validate the importance of evidence-based intervention for ASD to forestall PTSD.

Hoffman, A., Eisenkraft, A., Finkelstein, A., Schein, O., Rotman, E., & Dushnitsky, T. (2007). **A decade after the Tokyo sarin attack: A review of neurological follow-up of the victims.** *Military Medicine*, 172, 607-610. *Objective:* On March 20, 1995, sarin gas was used in Tokyo by members of the Japanese "Uhm-Shinrikiu" cult, killing 12 and injuring >5,500 innocent people. Most of the casualties were mildly injured. This article reviews the neurological follow-up data for some of the victims over the past decade. *Methods:* We reviewed the published literature regarding neurological follow-up of the victims, dividing the data according to the time elapsed after the attack. *Results:* The digit span test, finger-tapping test, and computerized posturography were the only performance tests that showed statistically significant differences between the victims and the control groups in some of the surveys. The main sequela 7 years after the attack was post-traumatic stress disorder. *Conclusion:* The results emphasize the need for a national preparedness program for such mass casualty events, led by national health systems. This should include long-term, neurological, follow-up monitoring with performance tests and a PTSD screening test.

Kato, H. (1998). **Posttraumatic symptoms among victims of the Great Hanshin—Awaji Earthquake in Japan.** *Psychiatry and Clinical Neurosciences*, 52 (55), S59-S65. doi: 10.1046/j.1440-1819.1998.0520s5S59.x. Two comparative studies conducted in the early and reconstruction stages following the 1995 Hanshin—Awaji earthquake in Japan are presented. In the first study, posttraumatic symptoms among younger evacuees (<60 years) were compared with the symptoms among the elderly evacuees (≥60 years) in the same shelter. In the first study, though most of the symptoms remained unchanged among the younger subjects from the time of the third-week assessment to that of the eighth week, the symptoms improved among the elderly subjects. In the second study, the psychological effects of those who were living in temporary housing and those who were not were compared during the reconstruction stage. That study demonstrated that the temporary housing residents had high exposure to the traumatic event, poor socioeconomic status, and various secondary stressors. The result of these factors is that they have a higher chance of facing various types of mental health problems. By examining the data obtained from these studies, the characteristics of psychological distress and coping among survivors at the different stages after the earthquake, and matters of future concern relating to the kind of mental health care required at each stage, are discussed.

Kato, H., Asukai, N., Miyake, Y., Minakawa, K., & Nishiyama, A. (1996). **Post-traumatic symptoms among younger and elderly evacuees in the early stages following the 1995 Hanshin—Awaji Earthquake in Japan.** *Acta Psychiatrica Scandinavica*, 93, 477-481. doi: 10.1111/j.1600-0447.1996.tb10680.x. We assessed the frequency of short-term, post-traumatic symptoms among evacuees of the Hanshin-Awaji earthquake. A total of 67 younger subjects (under 60 years) and 75 elderly subjects (60 years or above) were interviewed during the third week after the earthquake, and 50 and 73 subjects, respectively, were interviewed during the eighth week. All subjects were assessed using the Post-Traumatic Symptom Scale. During the first assessment, subjects from both age groups experienced sleep disturbances, depression, hypersensitivity and irritability. During the second assessment, the percentage of younger subjects experiencing symptoms did not decrease, while elderly subjects showed a significant decrease in 8 of 10 symptoms. This may have been due to such factors as decreased psychological stress, extensive social networks, and previous disaster experiences in the case of the elderly subjects.

Kawakami, N., Takeshima, T., Ono, Y., Hidenori, U., Nakane, Y., Nakamura, Y., et al. (2008). **Twelve-month prevalence, severity, and treatment of common mental disorders in communities in Japan: The World Mental Health Japan 2002—2004 Survey.** In R.C. Kessler & T.B. Üstün (Eds.), *The WHO World Mental Health Surveys: Global perspectives on the epidemiology of mental disorders.* (pp. 474-485). New York: Cambridge University Press. This chapter describes the methods and results of the World Mental Health Japan Survey conducted between 2002 and 2004, carried out in conjunction with the World Health Organization World Mental Health Survey Initiative. Seven communities, two cities and five rural municipalities, were selected for study. The entire interview was administered to 2436 adults, but Part 2 (which included PTSD) was administered to only 887 adults. The investigators estimated that in the past 12 months 0.4% of the Japanese population had PTSD; 4.1% had any anxiety disorder; 2.5% had any mood disorder; 1.2% had any substance use disorder; and 7.0% had any DSM-IV disorder. The chapter presents demographic correlates for the major categories of disorder.

Kawana, N., Ishimatsu, S., & Kanda, K. (2001). **Psycho-physiological effects of the terrorist sarin attack on the Tokyo subway system.** *Military Medicine*, 166 (Suppl. 2), 23-26. The investigation describes the follow-up of the victims of the 1995 Tokyo sarin attack who were followed by a team at the St. Luke's International Hospital. A symptom questionnaire ("St. Luke's Questionnaire") was developed and given 2, 3, and 5 years following the sarin attack. Somatic and psychological symptoms have continued for 5 years after the incident. New post-traumatic stress disorder diagnostic criteria, which include physical symptoms, were developed and applied for assessment of the outcomes. The St. Luke's cohort was also compared with other Japanese sarin attack cohorts. Interventions, including counseling, medical treatments, and support group activities, were associated with fewer symptoms among the victims.

Lifton, R.J. (1967). *Death in life: Survivors of Hiroshima.* New York: Random House. In this book, Lifton provides an in-depth presentation and discussion of the research he conducted with survivors of the atomic bombing in Hiroshima which, in the introduction, he describes as a "psychological kaleidoscope of an extraordinary immersion in death, lasting imagery of fear surrounding the possibility of radiation aftereffects, and lifelong struggle to integrate the event and its elaborate web of psychic consequences." The book was a pioneering effort in the field of traumatic stress studies. Altogether Lifton interviewed 75 survivors (*hibakusha*) from one to four times, with interviews lasting approximately two hours, 17 years after the bombing.

Lifton, R.J. (1970). **The Hiroshima bomb.** In *History and human survival: Essays on the young and old, survivors and the dead, peace and war, and on contemporary psychohistory.* (pp. 114-155). New York: Random House. In this essay, Lifton provides a relatively brief summary of the research he conducted with 75 survivors of the atomic bombing in Hiroshima. He describes the psychological and social consequences of the event by focusing on survivors' recollections of the bombing and current meanings; their residual concerns and fears; and their sense of self and society.

Matsuoka, Y., Nishi, D., Nakajima, S., Kim, Y., Homma, M., & Otomo, Y. (2008). **Incidence and prediction of psychiatric morbidity after a motor vehicle accident in Japan: The Tachikawa Cohort of Motor Vehicle Accident Study.** *Critical Care Medicine*, 36, 74-80. doi: 10.1097/01.CCM.0000291650.70816.D6. *Objectives:* To assess both the incidence of new-onset psychiatric illness after involvement in a motor vehicle accident in Japan for comparison with Western data and the predictors of psychiatric morbidity and PTSD evaluated immediately after the accident. *Design:* Prospective cohort study of injured patients assessed immediately and 4-6 wks after involvement in a motor vehicle accident. *Setting:* Intensive care unit in a teaching hospital in Tokyo, Japan. *Patients:* Total of 100 consecutive patients with motor vehicle accident-related injuries (mean Injury Severity Score, 11.2; mean Glasgow Coma Scale, 14.5; age, 18-69 yrs) admitted to the intensive care unit. Patients with traumatic brain injury, suicidality, current psychiatric or neurologic illness, or cognitive impairment were excluded. *Measurements:* An extensive clinical interview and evaluation of vital signs, sociodemographic variables, previous traumatic events, family history of psychopathology, Impact of Event Scale-Revised, Hospital

associated with mental health status. This report examines the relationship between the subsequent change in lifestyle and the psychological stress induced by the earthquake. *Method:* An investigation was made of 108 male inhabitants of Awaji Island as to their individual lifestyle before and after the great earthquake, any posttraumatic stress disorder (PTSD) symptoms, and their demographic variables. *Results:* The mean PTSD score was higher in the worse lifestyle group than in the no/better lifestyle change group. Category B or D of PTSD scores were higher in the worse lifestyle group than in the no/better lifestyle change group. The percentage of subjects who lived in temporary public housing was higher in the worse lifestyle group than in the no/better lifestyle change group. *Conclusions:* Worse change in lifestyle might be associated with high PTSD score in victims of Hanshin-Awaji earthquake.

Fukunishi, I. (1998). **Posttraumatic stress symptoms and depression in mothers of children with severe burn injuries.** *Psychological Reports, 83*, 331-335. This study examined posttraumatic stress symptoms and depressive symptoms in mothers of children with burn injuries from accidentally falling into a bathtub filled with hot water. Subjects were 16 pairs, children with burn injuries and their mothers. Psychiatric interviews were administered to the mothers to check the presence or absence of mental disorders. The severity of mothers' depressive symptoms was rated on the Hamilton Depression Scale. Prevalence rates of DSM-IV posttraumatic stress disorder and major depression were 6.3% and 0% in children with burn injury and 12.5% and 18.8% in their mothers, respectively. For three symptoms of posttraumatic stress disorder (intense distress at similar event, restricted range of affect, and hypervigilance), prevalence rates were significantly higher for the mothers than for the children. Ratings of the three symptoms of posttraumatic stress disorder for the mothers were significantly and positively correlated with scores for guilt feelings. Compared with children with burn injury, mothers are prone to posttraumatic stress symptoms mixed with guilt feelings for children with burn injury.

Fukunishi, I., Sasaki, K., Chishima, Y., Anze, M., & Saijo, M. (1996). **Emotional disturbances in trauma patients during the rehabilitation phase: Studies of posttraumatic stress disorders and alexithymia.** *General Hospital Psychiatry, 18*, 121-127. doi: 10.1016/0163-8343(95)00121-2. Recent studies have shown a partial similarity between PTSD and alexithymia. In this study, the authors examined the relationship between PTSD and alexithymia in two samples of 26 patients with burn injury and 27 patients with digit amputation during rehabilitation. The prevalence rates of DSM-III-R PTSD and alexithymia assessed by the Toronto Alexithymia Scale (TAS) were significantly higher for injury patients than for healthy volunteers. The rate of PTSD symptoms of avoidance and emotional numbing was significantly and positively correlated with the TAS scores in injury patients. The PTSD symptoms of avoidance and emotional numbing had a significant relationship with function after digit replantation. Alexithymia also had a similar relationship with physical conditions. These results suggest that 1) in some cases, alexithymia may be evident when PTSD emotional symptoms appear in injury patients, and 2) emotional disturbances (i.e., PTSD symptoms of avoidance and emotional numbing and alexithymia) may be influenced by the level of functional recovery after digit replantation.

Izuzu, T., Shibuya, M., Tsutsumi, A., Konishi, T., & Kawamura, N. (2008). **The relationship between past traumatic experience and sickness absence.** *International Journal of Social Psychiatry, 54*, 83-89. doi:10.1177/0020764007083874. *Background:* Past traumatic experiences have been reported to lower stress tolerance, thereby increasing job strain. However, the relationship between past traumatic experiences and employee sickness absence is poorly understood. *Aims:* This study explores the relationship between sickness absence and past traumatic experience with regard to the amount of time lapsed after the experience, job strain and other mental health states such as depression and anxiety. *Methods:* A total of 3238 workers were assessed for levels of traumatic stress, depressive status, anxiety and job stress. *Results:* Odds ratios of the presence of traumatic experiences to sickness absence, adjusted for sex, age and depressive and anxiety states, were presented according to the length of time that had passed since the traumatic events. The odds ratio in the 0–1 Years Group was 1.75 ($p < 0.05$), and the odds ratio for the 19+ Years Group was 1.46 ($p < 0.1$). *Conclusions:* Past traumatic events are related to sickness absence. Sickness absence resulting from a past traumatic experience is important with respect to industrial health.

Kuwabara, H., Shioiri, T., Toyabe, S., Kawamura, T., Koizumi, M., Ito-Sawamura, M., et al. (2008). **Factors impacting on psychological distress and recovery after the 2004 Niigata-Chuetsu earthquake, Japan: Community-based study.** *Psychiatry and Clinical Neurosciences, 62*, 503-507. doi: 10.1111/j.1440-1819.2008.01842.x. *Aim:* This study was undertaken 5 months after the 2004 Niigata-Chuetsu earthquake in Japan to assess factors that impacted on psychological distress and its recovery. *Methods:* Three thousand and twenty-six adult victims who lived in temporary shelter and in seriously damaged areas were evaluated by questionnaire. The questionnaire queried subject profile, degree of house damage, health status, and psychological distress using a 5-point scale before, immediately, and 5 months after the earthquake. *Results:* Immediately after the earthquake, 59.3% of the subjects had psychological distress. At 5 months after the earthquake, however, this percentage decreased to 21.8%. The psychological distress immediately after the earthquake was significantly serious in victims who: (i) were female; (ii) felt stronger fear of the earthquake and the aftershocks; (iii) lived at home or office after the earthquake; and (iv) were injured due to the earthquake or suffered from sickness after the earthquake. In contrast, the factors impairing psychological recovery 5 months after the earthquake were as follows: (i) being with unfamiliar member(s) during the night after the earthquake; (ii) serious house damage; (iii) living in temporary shelter or at a relative's home after the earthquake; and (iv) physical illness after the earthquake. *Conclusion:* Despite differences between disasters, these results were consistent with those in some previous studies and may be useful for long-term mental care support.

Kwon, Y., Maruyama, S., & Morimoto, K. (2001). **Life events and posttraumatic stress in Hanshin-Awaji earthquake victims.** *Environmental Health and Preventive Medicine, 6*, 97-103. doi: 10.1007/BF02897953. Stress induced by disaster is experienced to varying degrees by all respondents, and is known to evoke psychophysiological reactions. In this study, we investigated the relationships between earthquake-related life events and posttraumatic stress symptoms. A total of 380 adults were surveyed one year after the 1995 Hanshin-Awaji earthquake in Japan. The questionnaire included items concerning earthquake-related life events, emotional support and PTSD symptoms. As a result, after controlling for demographic variables, earthquake-related life events were significantly related to the grade of posttraumatic stress and its three components: re-experience, avoidance, and arousal, in both male and female subjects. Male subjects who currently had lower emotional support showed higher scores of posttraumatic stress and arousal. In conclusion, a higher experience of earthquake-related life events appears to be an important risk factor for development of poor mental health status following an earthquake disaster.

Maeda, M., Kato, H., & Maruoka, T. (2009). **Adolescent vulnerability to PTSD and effects of community-based intervention: Longitudinal study among adolescent survivors of the Ehime Maru sea accident.** *Psychiatry and Clinical Neurosciences, 63*, 747-753. doi: 10.1111/j.1440-1819.2009.02031.x. *Aims:* The aim of the present study was to examine the psychological impact on adolescent survivors of a maritime disaster that resulted in the deaths of nine people, including four high school students, and the effects of psychiatric intervention for the survivors. *Methods:* Long-term multidimensional intervention consisting of psychoeducation, hospital treatment, family support, and day care was provided for nine adolescent survivors. To evaluate these effects, the survivors were also assessed using self-rating scales (Impact of Event Scale, General Health Questionnaire, and Self-rating Depression Scale) and psychiatric structured interviews (Clinician-Administered PTSD Scale) at 2, 8, 14, 26, and 38 months after the accident. *Results:* Prevalence of PTSD among adolescent survivors was much higher than in adult survivors at the 2-month examination (78% vs 12%, respectively). Although the observed prevalence remained high until the 14-month examination, remarkable improvement occurred thereafter and none was diagnosed with PTSD at the 38-month examination. *Conclusion:* Adolescents may have a specific vulnerability to PTSD and community-based intervention is effective for adolescents with serious symptoms of PTSD.

Murata, K., Araki, S., Yokoyama, K., Okumura, T., Ishimatsu, S., Takasu, N., et al. (1997). **Asymptomatic sequelae to acute sarin poisoning in the central and autonomic nervous system 6 months after the Tokyo subway attack.** *Journal of Neurology*, 244, 601-606. Six to eight months after the Tokyo subway attack in March 1995, the neurophysiological effects of acute sarin poisoning were investigated in 18 passengers exposed to sarin (sarin cases) in the subways to ascertain the focal or functional brain deficits induced by sarin. The event-related and visual evoked potentials (P300 and VEP), brainstem auditory evoked potential, and electrocardiographic R-R interval variability (CVRR), together with the score on the PTSD checklist, were measured in the sarin cases and the same number of control subjects matched for sex and age. None of the sarin cases had any obvious clinical abnormalities at the time of testing. The P300 and VEP (P100) latencies in the sarin cases were significantly prolonged compared with the matched controls. In the sarin cases, the CVRR was significantly related to serum cholinesterase (ChE) levels determined immediately after exposure; the PTSD score was not significantly associated with any neurophysiological data despite the high PTSD score in the sarin cases. These findings suggest that asymptomatic sequelae to sarin exposure, rather than PTSD, persist in the higher and visual nervous systems beyond the turnover period of ChE; sarin may have neurotoxic actions in addition to the inhibitory action on brain ChE.

Nishi, D., Matsuoka, Y., & Kim, Y. (2010). **Posttraumatic growth, posttraumatic stress disorder and resilience of motor vehicle accident survivors.** *BioPsychoSocial Medicine*, 4: 7. doi: 10.1186/1751-0759-4-7. *Background:* Although some previous studies have suggested that posttraumatic growth (PTG) is comprised of several factors with different properties, few have examined both the association between PTG and PTSD and between PTG and resilience, focusing on each of the factors of PTG. This study aimed to examine the hypothesis that some factors of PTG, such as personal strength, relate to resilience, whereas other factors, such as appreciation of life, relate to PTSD symptoms among Japanese motor vehicle accident (MVA) survivors. *Methods:* This cross-sectional study was performed with 118 MVA survivors at 18 months post MVA. Data analyzed included self-reporting questionnaire scores on the Posttraumatic Growth Inventory (PTGI), the Impact of Event Scale – Revised (IES-R), and the Sense of Coherence (SOC) scale, which is one of the most widely used scales for measuring resilience. Correlations between scores on the PTGI and IES-R, the PTGI and SOC scale, and the IES-R and SOC scale were established by calculating Spearman's correlation coefficients. *Results:* PTGI was positively correlated with both SOC and PTSD symptoms, in spite of an inverse relationship between SOC and PTSD symptoms. Relating to others, new possibilities, and personal strength on the PTGI were correlated positively with SOC, and spiritual change and appreciation of life on the PTGI were positively correlated with PTSD symptoms. *Conclusions:* Some factors of PTG were positively correlated with resilience, which can be regarded as an outcome of coping success, whereas other factors of PTG were positively correlated with PTSD symptoms, which can be regarded as signifying coping effort in the face of enduring distress. These findings contribute to our understanding of the psychological change experienced by MVA survivors, and to raising clinicians' awareness of the possibility that PTG represents both coping effort coexisting with distress and outcome of coping success.

Nishi, D., Matsuoka, Y., Yonemoto, N., Noguchi, H., Kim, Y., & Kanba, S. (2010). **Peritraumatic distress inventory as a predictor of post-traumatic stress disorder after a severe motor vehicle accident.** *Psychiatry and Clinical Neurosciences*, 64, 149-156. doi: 10.1111/j.1440-1819.2010.02065.x. *Aim:* The aim of this study was to examine the utility of the Peritraumatic Distress Inventory (PDI) as a predictor of subsequent PTSD in severe motor vehicle accident survivors. *Methods:* Patients consecutively admitted to the intensive care unit were assessed immediately and 1 month after accidents in this prospective study. The predictive value for post-traumatic stress symptoms at 1 month of the PDI at initial assessment was examined by using multivariate regression analysis. Moreover, the accuracy of the PDI as a predictor of PTSD was determined using receiver operator characteristic curve analysis. Post-traumatic stress symptoms were assessed using the Impact of Event Scale – Revised questionnaire, and PTSD was assessed using the Clinician-Administered PTSD Scale. *Results:* Seventy-nine patients completed the Impact of Event Scale – Revised questionnaire, and 64 patients participated in a structured interview. Of 64 patients, 13 met the diagnostic criteria of full or partial PTSD. The PDI was an independent predictor of post-traumatic stress symptoms

($P = 0.003$). The data indicated that a cut-off score of 23 maximized the balance between sensitivity (77%) and specificity (82%) in this study. Compared with negative predictive value (93%), positive predictive value was not high (53%). *Conclusion:* The study suggests the predictive usefulness of the PDI for subsequent PTSD in accident survivors. Its adequate usage should be further elaborated.

Ohmi, H., Kojimi, S., Awai, Y., Kamata, S., Sasaki, K., Tanaka, Y., et al. (2002). **Post-traumatic stress disorder in pre-school aged children after a gas explosion.** *European Journal of Pediatrics*, 161, 643-648. doi: 10.1007/s00431-002-1061-2.

To evaluate the sensitivity of diagnostic criteria for PTSD in pre-school-aged children involved in a gas explosion, post-traumatic symptoms of the children were investigated four times after the accident, immediately, 10 days, 6 months, and 1 year later. Using symptoms at 6 months after the accident, sensitivity of diagnostic criteria was assessed by comparing the fourth edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), and the alternative criteria for infants and young children [10]. In addition, the published Child Post-Traumatic Stress Disorder Reaction Index (CPTSD-RI) and its modified version proposed by us were also evaluated for their sensitivity to rate the symptoms. Girls had a tendency to show more post-traumatic symptoms than boys. Although no children met DSM-IV criteria for PTSD, 8 children out of 32 were diagnosed as having PTSD with alternative criteria. With our modified CPTSD-RI, all eight children were decidedly more statistically distinguishable from those without PTSD than with original index. *Conclusion:* Our data indicate that the sensitivity of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (4th edition) and the Child Post-Traumatic Stress Disorder Reaction Index in rating symptoms of pre-school aged children is not sufficient. The alternative criteria of the former and modified version of the latter would be the better choice in this age group.

Ohtani, T., Iwanami, A., Kasai, K., Yamasue, H., Kato, T., Sasaki, T., et al. (2004). **Post-traumatic stress disorder symptoms in victims of Tokyo subway attack: A 5-year follow-up study.** *Psychiatry and Clinical Neurosciences*, 58, 624-629. doi: 10.1111/j.1440-1819.2004.01313.x. Sarin gas was dispersed in a Tokyo subway in 1995. This study investigates the mental and somatic symptoms of the 34 victims 5 years after the attack. Structured interviews (Clinician-Administered Post-Traumatic Stress Disorder [CAPS] and Mini International Neuropsychiatric Interview) and self-rating questionnaires were used to assess the symptoms. Not only PTSD but also non-specific mental symptoms persisted in the victims at a high rate. A total of 11 victims were diagnosed with current or lifetime PTSD according to CAPS. Victims with PTSD showed higher anxiety levels and more visual memory impairment. A significant correlation between the total score of Impact of Event Scale-Revised (IES-R) and CAPS was found, indicating that IES-R is a useful tool for evaluating PTSD.

Shigematsu, I. (1998). **Greetings: 50 years of Atomic Bomb Casualty Commission-Radiation Effects Research Foundation studies.** *Proceedings of the National Academy of Sciences of the United States of America*, 95, 5424-5425. The Atomic Bomb Casualty Commission was established in Hiroshima in 1947 and in Nagasaki in 1948 under the auspices of the U.S. National Academy of Sciences to initiate a long-term and comprehensive epidemiological and genetic study of the atomic bomb survivors. It was replaced in 1975 by the Radiation Effects Research Foundation which is a nonprofit Japanese foundation binationally managed and supported with equal funding by the governments of Japan and the United States. Thanks to the cooperation of the survivors and the contributions of a multitude of scientists, these studies flourish to this day in what must be the most successful long-term research collaboration between the two countries. Although these studies are necessarily limited to the effects of acute, whole-body, mixed gamma-neutron radiation from the atom bombs, their comprehensiveness and duration make them the most definitive descriptions of the late effects of radiation in humans. For this reason, the entire world relies heavily on these data to set radiation standards. As vital as the study results are, they still represent primarily the effects of radiation on older survivors. Another decade or two should correct this deficiency and allow us to measure definitively the human risk of heritable mutation from radiation. We look to the worldwide radiation and risk community as well as to the survivors who have contributed so much to what has been done already to accomplish this goal.