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Trajectories of posttraumatic stress symptomatology in older persons affected by a large-magnitude disaster

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ABSTRACT

This study examined the nature and determinants of longitudinal trajectories of disaster-related posttraumatic stress disorder (PTSD) symptoms in older persons affected by a large-magnitude disaster. Two hundred six adults age 60 or older (mean = 69, range = 60–92) who resided in the Galveston Bay area when Hurricane Ike struck in September 2008 completed telephone interviews an average of 3-, 6-, and 15-months after this disaster. Latent growth mixture modeling was employed to identify predominant trajectories of disaster-related PTSD symptoms over time; and pre-, peri-, and post-disaster determinants of these trajectories were then examined. A 3-class solution optimally characterized PTSD symptom trajectories, with the majority (78.7%) of the sample having low/no PTSD symptoms over all assessments (i.e., resistant); 16.0% having chronically elevated symptoms (i.e., chronic); and 5.3% having a delayed onset course of symptoms (i.e., delayed-onset). Lower education, greater severity of Hurricane Ike exposure (i.e., Ike-related physical illness or injury and high level of community destruction), and greater number of traumatic and stressful life events after Hurricane Ike, particularly financial problems, were associated with a chronic PTSD trajectory. Greater number of traumatic and stressful life events, particularly financial problems after Hurricane Ike, was also associated with a delayed-onset trajectory. These findings suggest that there are heterogeneous trajectories of disaster-related PTSD symptoms in older adults and that these trajectories have common and unique determinants. They also underscore the importance of prevention efforts designed to mitigate the deleterious effects of post-disaster stressors, most notably financial distress, in older persons affected by disasters.

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1. Introduction

Exposure to a disaster increases risk for posttraumatic stress disorder (PTSD; Acierno et al., 2007, 2006; Amstadter et al., 2009; Galea et al., 2007, 2005, 2008; Kessler et al., 2008; Norris et al., 2002a, 2002b; Pietrzak et al., 2012b). After a disaster, PTSD symptoms may evolve in complex ways and be characterized by heterogeneous symptom trajectories. Common trajectories of PTSD symptoms that have been identified in trauma-affected samples include minimal to no symptoms over time (i.e., resistant); initial mild-to-moderate symptoms followed by a reduction to minimal/no symptoms over time (i.e., resilient); chronically elevated symptoms over time (i.e., chronic) and initial minimal/no symptoms followed by an increase in symptoms over time (i.e., delayed onset; Bonanno et al., 2008, 2012; Bonnano, 2005; deRoon-Cassini et al., 2010; Norris et al., 2009).

Determinants of disaster-related PTSD symptom severity and probable diagnosis may be divided into three categories based on their temporal relation to a disaster (Freedy et al., 1994). Pre-disaster factors are those that precede a disaster, such as female sex, ethnic minority status, lower education and income, and medical and psychiatric history (Norris et al., 2002a, 2002b). Prior exposure to disasters may also help "inoculate" against disaster-related psychological distress, as familiarity or experience in recovering from a disaster may help enhance coping skills (Knight et al., 2000; Norris and Murrell, 1988). Peri-disaster factors are

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those that occur around the time of the disaster, such as greater severity of trauma exposure, personal losses, community destruction; and peri-disaster dissociative and autonomic symptoms (Bovin and Marx, 2011; Ozer et al., 2003; Shalev et al., 1998). Post-disaster factors are those that occur after a disaster and may affect recovery, such as social support and secondary traumas and life stressors (Acierno et al., 2006; Brewin et al., 2000; Cerdá et al., 2012, in press; Kessler et al., 2012; Miguel-Tobal et al., 2006; Person et al., 2006; Tracy et al., 2011). While these studies suggest that a broad range of pre-, peri-, and post-disaster factors may be related to severity and probable diagnoses of disaster-related PTSD, little is known about how they are related to heterogeneous longitudinal trajectories of disaster-related PTSD symptoms.

To date, no study of which we are aware has examined the nature of predominant trajectories of disaster-related PTSD symptoms in older persons. Characterization of such trajectories in this population is important for several reasons. First, older persons may have physical limitations, diminished sensory and cognitive capacities, and/or financial difficulties that may affect their preparation for, adaptability to, and recovery from a disaster (Aldrich and Benson, 2008; Dyer et al., 2008; Fernandez et al., 2002). Second, there are unique risk factors for psychopathology in disaster-affected older adults (Acierno et al., 2006; Phifer and Norris, 1989), including the presence of a chronic psychiatric and/or medical condition, as well as the cumulative lifetime burden of trauma and stress, which may increase risk for disaster-related psychopathology (Acierno et al., 2006; Fernandez et al., 2002; Sakauye et al., 2009). Third, older persons are often exposed to a greater level of danger during disasters, are less likely to receive warnings, and often endure greater financial losses (Acierno et al., 2006; Aldrich et al., 2008; Sakauye et al., 2009; Thompson et al., 1993). Fourth, older adults are also more likely to experience subsyndromal than syndromal levels of PTSD symptoms (Glaesmer et al., 2012; Pietrzak et al., 2012a; van Zelst et al., 2003; Yang et al., 2003); and may be uniquely affected by certain risk factors for disaster-related psychopathology (e.g., disaster-related financial losses; Acierno et al., 2007; Kohn et al., 2005; Yang et al., 2003). Taken together, this work suggests that, after a disaster, older adults may exhibit heterogeneous patterns of psychopathology, which may have unique risk factors. For example, older adults with greater personal losses and community destruction may be more likely to have a chronic symptom trajectory, while those who experience an increasing burden of financial distress in the aftermath of a disaster may be more likely to experience a delayed-onset symptom trajectory. Characterization of the nature and determinants of these trajectories in older adults is useful, as it can help identify potentially modifiable factors associated with problematic PTSD symptom trajectories that are specific to this population.

Hurricane Ike was the third costliest hurricane to ever make landfall in the United States, accounting for $29.6 billion in damages. It also caused 195 deaths, and prompted the largest search-and-rescue operation in U.S. history and largest evacuation of Texans in state history (Berg, 2009). In the current study, we sought to examine the nature and determinants of longitudinal trajectories of Hurricane Ike-related PTSD symptoms at 3-, 6-, and 15-months after this disaster in older persons directly affected by this large-magnitude disaster.

2. Materials and methods

2.1. Sample

A total of 658 adults age 18 or older who had been living in Galveston County or Chambers County, Texas for at least one month before September 13, 2008 when Hurricane Ike struck participated in this study. A disproportionate stratified cluster sampling was employed to acquire samples of individuals residing in areas of Galveston County or Chambers County that experienced more damage from Hurricane Ike and that were more likely to be exposed to hurricane-related traumas. The cooperation rate for the full sample was 83%. A total of three assessments were conducted. The median date of the first assessment was December 21, 2008 (3 months, 9 days after Hurricane Ike made landfall in Texas); second assessment was April 05, 2009 (6 months, 24 days after Hurricane Ike made landfall); and third assessment was December 28, 2009 (15 months, 15 days after Hurricane Ike made landfall). Interviews were conducted by experienced interviewers at the University of Michigan Institute for Social Research using a computer-assisted interview system. Interviewer training was tailored to the protocol and survey content, with special emphasis on the context for this study. In their training, interviewers were taught to listen for cues from the respondent that might indicate difficulty comprehending the survey. Interviewers were also trained in how to handle unusual circumstances the might emerge during the interviews, such as respondents' having hearing, cognitive, or serious medical difficulties; difficulty comprehending survey material; and reluctance to engage in the interview. If an interviewer noticed that a respondent had any of these difficulties, he or she would temporarily discontinue the interview and promptly discuss this with the study supervisor for appropriate follow up. If the interviewer and supervisor concluded that a potential respondent had a limitation that rendered them unable complete the interview, the interview was suspended and coded a non-interview; of respondents aged 60 or older, 5 were coded as non-interviews. Interviews lasted an average of 70 min. Additional details regarding sampling and recruitment procedures are available elsewhere (Norris et al., 2010). Two hundred six respondents (31.3% of full sample) were 60 or older at the time of the interview and are the focus of this study. Data were weighted to correct for oversampling and non-response.

2.2. Assessments

Hurricane Ike-related PTSD symptoms were assessed using the PTSD Checklist-Specific Stressor Version (PCL-S; Weathers et al., 1993), a 17-item self-report instrument that assesses DSM-IV symptoms of PTSD related to a specific traumatic event. Total scores on the PCL-S range from 17 to 85. Questions regarding Hurricane-Ike PTSD symptoms were assessed by phrasing each of the 17 PCL items in the following manner: "How much were you bothered by repeated, disturbing memories, thoughts, or images of *Hurricane Ike*? Would you say not at all, a little bit, moderately, quite a bit, or extremely?" In a prior study that employed a receiver operating characteristic (ROC) curve analysis of PCL-S scores in the current sample, a score $\geq$37 was found to be optimal in identifying older persons with a probable DSM-IV-based diagnosis of Hurricane Ike-related PTSD (Pietrzak et al., 2012c). Thus, scores that meet or exceed this threshold are indicative of clinically significant Ike-related PTSD symptoms.

Hurricane Ike exposures were assessed using questions that asked about respondents' experiences during and after Hurricane Ike. These experiences were grouped into 9 categories: (1) threat to safety of self or family/friends; (2) injury or health problem to self or household member; (3) family member or close friend injured or killed; (4) saw dead bodies during or after Hurricane Ike; (5) damage to three or more types of property (e.g., residence, furnishings, cars/vehicles); (6) financial loss (i.e., lost income as a result of Hurricane Ike); (7) displacement from home >10 days; (8) lacking two or more necessities for >1 week (e.g., shelter, electricity, food/water, transportation); and (9) high level of area