The burden of hostility in U.S. Veterans: Results from the National Health and Resilience in Veterans Study

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ABSTRACT

Hostility is associated with substantial mental and physical health consequences. Population-based data regarding the nature and longitudinal course of hostility in U. S. veterans are scarce. We analyzed data from 2157 U. S. veterans who participated in the National Health and Resilience in Veterans Study, a nationally representative, prospective cohort study of U. S. veterans. We identified the prevalence of longitudinal courses of hostility (chronic, increasing, decreasing, or no hostility). We then evaluated relationships between sociodemographic, risk, and protective correlates measured at baseline and longitudinal courses of two aspects of hostility—aggressive urges and difficulties controlling anger. The majority of veterans (61.2%) reported experiencing difficulties controlling anger and a sizable minority of veterans (23.9%) reported experiencing aggressive urges over a two-year period. Protective psychosocial characteristics (e.g., optimism) and aspects of social connectedness (e.g., secure attachment style) were negatively associated with hostility. Psychological distress predicted all symptomatic hostility courses, while alcohol misuse predicted chronic aggressive urges and all symptomatic courses of difficulties controlling anger. These findings provide the first known population-based evaluation of the prevalence, course, and risk and protective correlates of hostility in U. S. veterans, and suggest targets for prevention and treatment efforts that can help mitigate risk for hostility in this population.

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1. Introduction

Hostility is a major public health issue associated with substantial negative consequences (Lahey, 2009). Hostility and anger, generally considered to be cognitive and affective in nature, respectively, reciprocally activate each other and motivate aggressive behavior (Orth and Wieland, 2006). A large body of literature has found that hostility prospectively predicts posttraumatic stress disorder (PTSD; e.g., Heinrichs et al., 2005), depression (Stewart et al., 2010), suicidal acts (Romanov et al., 1994), coronary heart disease (e.g., Chida and Steptoe, 2009), and all-cause mortality (Klabbers et al., 2013). Hostility in young adulthood predicts lower perceived social support in mid-life (Siegler et al., 2003). Further, hostility is associated with maladaptive health behaviors, such as poor medication adherence (Lee et al., 1992), avoidance of exercise (Siegler et al., 2003), high-fat diet (Siegler et al., 2003), and

alcohol, caffeine, and cigarette use (Calhoun et al., 2001; Whiteman et al., 1997). While the prevalence and correlates of hostility have been established in cardiac disease populations, data are lacking regarding the prevalence, course, and determinants of hostility in general population-based samples.

Understanding the epidemiology of hostility is particularly relevant to military personnel and veterans for two key reasons. First, veterans seeking care at Veterans Administration (VA) medical centers exhibit higher rates of many documented correlates of hostility, including heart disease, functional impairment, PTSD, depression, and utilization of mental health care, than their non-veteran counterparts (Hankin et al., 1999; Kazis et al., 1999). Second, military samples report higher rates of violent behavior than individuals in nationally representative civilian samples (Straus and Gelles, 1990). However, only a few studies (e.g., Elbogen et al., 2010) have explored the prevalence, course, and determinants of hostility in veterans, and fewer (Heesink Rademaker et al., 2015) have been longitudinal in nature. Further, to our knowledge, there have been no such studies in nationally representative samples of veterans, including those who are not seeking care at VA. Additional data are needed, including data collected from veterans later in life, as they can help advance

understanding of the burden of hostility in veterans, as well as inform the development of population-based prevention and treatment efforts to prevent hostility and its potential consequences in veterans.

Several risk factors for hostility in veterans have been identified. These factors include sociodemographic characteristics (e.g., younger age: Taft et al., 2009), financial problems (e.g., Beckham et al., 1997), childhood trauma (e.g., Taft et al., 2005; Elbogen et al., 2010; Heesink et al., 2015), pre-deployment behavior (e.g., history of violence; Newby et al., 2005), military service-related variables (e.g., combat exposure; Beckham et al., 1997), drug and alcohol use (e.g., MacManus et al., 2013), PTSD (e.g., Elbogen et al., 2012), major depressive disorder (Taft et al., 2009), and head injury (Grafman et al., 1996). While risk factors for hostility in veterans are relatively well characterized, *protective* factors that may help mitigate the development or maintenance of hostility in veterans and that could be fostered by psychosocial interventions are poorly understood. To our knowledge, only two published studies have evaluated protective correlates of hostility in veterans. Elbogen and colleagues found that in a random sample of Iraq and Afghanistan War veterans, aspects of basic functioning and well-being were cross-sectionally (2012) and longitudinally (i.e., at one-year follow-up; 2014) associated with reduced risk for physical aggression. While these studies provide important insight into some protective factors linked to hostility, many constructs identified in the positive psychology literature (e.g., optimism, purpose in life) that may help mitigate hostility have not been evaluated. Further, the majority of extant studies on risk and protective factors associated with hostility in veterans have recruited convenience samples of treatment-seeking Vietnam-era combat veterans (e.g., Beckham et al., 1997). Consequently, the generalizability of these results to the broader population of veterans is unknown.

Characterization of the prevalence, course, and correlates of hostility in nationally representative samples of U. S. veterans of all eras can help inform the population-based burden of this problem and potentially inform healthcare policies and risk assessment tools aimed at violence risk reduction. Thus, the primary aims of this study were to analyze data from a contemporary, nationally representative sample of U. S. veterans to: (1) characterize patterns of courses of hostility and their prevalence over a two-year period, and (2) examine risk and protective correlates of these courses of hostility.

2. Methods

2.1. Participants

Data were drawn from the National Health and Resilience in Veterans Study (NHRVS), a contemporary, nationally representative, prospective cohort study of U. S. veterans. The NHRVS sample was drawn from a research panel of more than 50,000 U. S. households that is maintained by GfK Knowledge Networks, Inc. (Menlo Park, CA). Knowledge Networks maintains Knowledge Panel, a probability-based, online, non-volunteer access survey panel of a nationally representative sample of U. S. adults that covers approximately 98% of U. S. households, including mobile phone-only households. The GfK Knowledge Networks recruitment protocol relies on probability-based sampling of addresses from the U. S. Postal Service's Delivery Sequence File (DSF); the key advantage of the address-based sampling methodology is that it allows sampling of almost all U. S. households. Participants are provided with a computer and Internet access if necessary. Of the 3188 individuals in the panel who answered "Yes" to an initial screening question about veteran status ("Have you ever served on

active duty in the U. S. Armed Forces, Military Reserves, or National Guard? "), 99.0% ($n = 3157$) completed a 60-minute online survey between October-December 2011 (Wave 1). Wave 2 of the NHRVS, conducted two years later from October-December 2013, re-surveyed 2157 (68.3%) of the Wave 1 participants. Compared to veterans who completed assessments at both waves, veterans who did not complete Wave 2 were younger (mean[SD]=58.09[16.09] vs. 61.54[14.19], $t = 6.08$, $p < 0.001$) and more likely to be male ($\chi^2 = 7.64$, $p < 0.01$), White ($\chi^2 = 5.56$, $p < 0.05$), and to have a high school education ($\chi^2 = 5.22$, $p < 0.05$). To permit generalizability of study results to the entire population of U. S. veterans, post-stratification weights based on demographic distributions (i.e., age, census region, education, metropolitan area, race/ethnicity, and sex) drawn from the most recent U.S. Census Bureau Current Population Survey (2012) were computed by GfK Knowledge Networks statisticians and applied in inferential analyses. Demographic characteristics of the sample were highly consistent with characteristics observed in previous population-based studies of veterans (see Pietrzak et al., 2014 for more information). All participants provided informed consent, the Human Subjects Subcommittee of the VA Connecticut Healthcare System and VA Office of Research & Development approved the study, and the investigation was carried out in accordance with the latest version of the Declaration of Helsinki.

2.2. Assessments

2.2.1. Hostility

Participants completed the six-item Hostility subscale of the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994). These items ask individuals to report the extent to which they have been distressed or bothered by six symptoms in the past month using a five-point Likert scale (i.e., 0=*Not at all* to 4=*Extremely*). Confirmatory factor analyses supported a 2-factor model consistent with that reported by Elbogen and colleagues (2010): aggressive urges (2 items: "having urges to break or smash things" and "having urges to beat, injure, or harm someone"; $\alpha = 0.85$) and difficulties controlling anger (4 items; "feeling easily annoyed or irritated", "temper outbursts that you could not control", "getting into frequent arguments", and "shouting or throwing things"; $\alpha = 0.86$). We used these two dimensions of hostility as our outcomes, which we dichotomized in the same manner as Elbogen et al. (2010): 0=at or below median; 1=above median. We used Wave 1 and Wave 2 scores to assign participants to one of four groups for each of the two hostility measures: no hostility (i.e., no hostility at Wave 1 or 2), decreasing hostility (i.e., any hostility at Wave 1, none at Wave 2), increasing hostility (i.e., no hostility at Wave 1, any at Wave 2), and chronic hostility (i.e., any hostility at both Waves 1 and 2). Compared to veterans who completed both waves, veterans who did not complete Wave 2 reported more severe aggressive urges (mean[SD]=0.24[0.43] vs. 0.17[0.37], $t = 4.74$, $p < 0.001$) and more difficulties controlling anger (mean [SD]=0.55[0.50] vs. 0.46[0.50], $t = 5.01$, $p < 0.001$).

2.2.2. Risk and protective factors

A broad range of demographic, medical, military, psychiatric, cognitive, and psychosocial variables were assessed in the NHRVS with brief validated measures intended to allow for measurement of the most constructs as efficiently as possible. Variables were reduced to factors via exploratory factor analyses (see Pietrzak and Cook, 2013 for details). Combat status and number of deployments to war zones were assessed with the items "Did you ever serve in a combat or war zone? " and "How many times did you deploy to a combat or war zone? ", respectively. Participants who reported combat status endorsed having deployed an approximate average of three times, with the majority of participants having deployed