

Assessing Risk of Violent Behavior Among Veterans With Severe Mental Illness

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Although empirical research has examined factors associated with increased violence risk among individuals with severe mental illness (SMI) and among veterans without SMI, less attention has been devoted to identifying violence risk factors among veterans with SMI. Using multivariable analysis of a large pooled sample of individuals with SMI, this study examines violence risk factors of $N = 278$ veterans with SMI. In multivariate modeling, violence by veterans with SMI was associated with head injury, posttraumatic stress disorder (PTSD), substance abuse, and homelessness. Results support the view clinicians assessing violence risk among veterans with SMI should consider a combination of characteristics empirically related to violence by non-veterans with SMI (e.g., homelessness) and veterans without SMI (e.g., PTSD).

Clinicians providing services for veterans with severe mental illness (SMI) such as schizophrenia, bipolar disorder, depression with psychotic features, and other psychotic disorders routinely encounter the challenge of managing patients' risk of violence (Frueh, Turner, Beidel, & Cahill, 2001; McFall, Fontana, Raskind, & Rosenheck, 1999). Researchers have attempted to establish empirically validated factors that show strong relationships with risk behaviors among people with SMI (Swanson et al., 2002) and among veterans (Beckham, Moore, & Reynolds, 2000). In both

populations, violence is predicted by demographic, historical, and clinical factors including lower socioeconomic status, less education, younger age, history of child maltreatment, cohabitation, substance abuse, and head injury (Begic & Jokic-Begic, 2001; Marshall, Panuzio, & Taft, 2005; Monahan & Steadman, 1994).

Despite overlap between veterans and those with SMI, there are some violence risk factors that have been examined primarily with respect to SMI, including active psychotic symptoms, earlier age of onset of mental disorder, treatment nonadherence,

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and recent history of homelessness (Swanson et al., 2002; Swartz et al., 1998). Other violence risk factors have been more thoroughly investigated in veterans populations, such as witnessing parental conflict, posttraumatic stress disorder (PTSD), and combat exposure (Byrne & Riggs, 1996; McFall et al., 1999; Savarese, Suvak, King, & King, 2001). The purpose of the current study is to examine risk factors and identify that relates to violence by veterans with SMI.

METHOD

Participants and Procedure

We used data from the 5 Site Health and Risk Study, which was an investigation of risk behaviors in people with SMI in four states in the United States. (Rosenberg et al., 2001). Our study sample included veterans with psychotic or major mood disorders ($N = 278$) receiving treatment through the public mental health systems of Connecticut ($n = 19$), Maryland ($n = 15$), New Hampshire ($n = 34$), and of North Carolina at Duke University ($n = 24$) or the Durham Veterans Affairs Medical Center ($n = 186$).

The majority of psychiatric diagnoses (82.2%) were obtained from chart review and all available clinical data. However, 17.8% of diagnoses were based on the Structured Clinical Interview for DSM-IV (SCID) (Michael et al., 1997). Four of the sites used the SCID to diagnose some of their participants to validate the chart reviews and found high concordance rates. Standard protocol approval and consent procedures were completed; 13% of the overall sample (range = 9–28%) declined to participate due to questions about risk behaviors. Interviews lasting about 75 minutes occurred between June 1997 and December 1998. A payment of \$35 was given for participation in the study.

Measures

Violence and aggression. Violent behavior was defined as any physical fighting or actions causing bodily injury to another person, any use of a lethal weapon to harm or threaten someone, or any sexual assault in the past year. This definition corresponds to that used in the MacArthur Violence Risk Assessment Study (Monahan & Steadman, 1994). Participants were asked if they performed a violent act and were not asked to specify the intention of this behavior (e.g., was violent act initiated or triggered). Violence was assessed by self-report using items adapted from the antisocial personality section of the NIMH (National Institutes of Mental Health) Diagnostic Interview Schedule as modified for use in the Duke Mental Health Study (Swartz et al., 1998).

Demographic, historical, and contextual factors. Background variables examined included age, gender (0 = *female*, 1 = *male*), racial status (0 = *White*, 1 = *African American/Hispanic*), educa-

tion (0 = *less than high school*, 1 = *high school or beyond*), and income from all sources including any earnings, entitlement payments, and family contribution. Participants reported the age of onset of their mental illness (0 = *before 16 years of age*, 1 = *16 years of age or above*). Participants were asked, “When you were growing up, did you see or hear your parents/caretakers arguing or fighting a lot?” (0 = *no*, 1 = *yes*). Participants were also asked about a history of physical abuse: “Before you were 16, did someone throw or knock you down, hit you with a fist or kick you hard, beat you up, or grab you around the neck and choke you?” (0 = *no*, 1 = *yes*). We additionally measured combat exposure, in which participants were asked, “Did you ever serve in a combat zone?” (0 = *no*, 1 = *yes*). Participants were asked whether they had been homeless at some point over the past 6 months (0 = *no*, 1 = *yes*) and cohabitation status (0 = *single*, 1 = *married or cohabiting*).

Clinical factors. Current posttraumatic stress disorder was measured using established diagnostic cutoff scores (0 = score < 45, 1 = score > 45) on the PTSD Checklist (PCL; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). History of head injury was measured by participant response to “Has a doctor ever told you you’ve had a head injury?” (0 = *no*, 1 = *yes*). Treatment non-adherence was measured by self-report in which participants were asked, “In the past month, were there any prescription medications or shots you were supposed to take, but didn’t?” (0 = *no*, 1 = *yes*). Substance abuse was assessed by the Dartmouth Assessment of Lifestyle Instrument (DALI; Rosenberg, Drake, Wolford, & Mueser, 1998), specifically designed to identify substance use disorders in people with SMI (0 = *no*, 1 = *yes*). Psychiatric diagnosis was obtained from patient charts (0 = *affective disorder*, 1 = *psychotic disorder*). The anchored version of the Brief Psychiatric Rating Scale (BPRS) (Mourner, Mannuzza, & Kane, 1988) was used to assess current psychiatric symptoms.

Data Analysis

All analyses were conducted using SAS 9.1. Stepwise logistic regression analyses were employed in which independent variables were excluded from subsequent analyses if they did not have a significance level of 0.05. Multivariate analyses controlled for site as a covariate. Odds ratios produced by this technique estimate the average change in the odds of an outcome (e.g., violent behavior) associated with exposure to putative predictors (e.g., head injury). The log likelihood that χ^2 tests the overall significance of a given logistic regression model as does the pseudo R^2 describes the variance of the dependent variable described by the independent variables in the model.

Pooling the raw data from the five study sites posed a problem for inferential statistical analysis. The samples were not randomly selected from a population of persons with severe mental illness. The sites differed markedly from each other, and from national estimates, on the distributions of some variables that could be

associated with violence risk, specifically age and substance abuse comorbidity. To compensate for this potential bias, each of the five samples was weighted to match distributions on age and the prevalence of substance abuse in a nationally representative probability sample of the population of treated individuals with severe mental illness using data from the NIMH National Comorbidity Study (NCS; Kessler, McGonagle, & Zhao, 1994) for participants identified with psychotic or major mood disorders. Thus, prior to pooling the data, each of the five sites was individually weighted to the NCS subsample of treated SMI individuals, resulting in an unbiased sample.

RESULTS

Most participants in the sample were men (90%), with a median age of 46. About half were White (49%), of relatively low income (median \$800 a month), living alone (79%), high school graduates (54%), and 19.4% were recently homeless. Less than half (44%) reported being in a combat zone during their military service.

Overall, 54% of the sample witnessed their parents fighting as a child and 52% reported childhood physical abuse. Clinically, 58% had PTSD, 54% reported substance abuse, 56% had a psychotic disorder, 28% said a doctor had told them they had had a head injury, and 36% reported being noncompliant with medications in the past month. Nineteen percent of the participants reported violent behavior in the past 6 months.

Bivariate analyses showed violence was related to witnessing parent fights, $\chi^2(1, 278) = 4.65, p < .05$; childhood physical abuse, $\chi^2(1, 278) = 10.62, p < .01$; psychiatric symptoms on the BPRS, $\chi^2(1, 278) = 9.02, p < .01$; substance abuse, $\chi^2(1, 278) = 7.27, p < .01$; current PTSD, $\chi^2(1, 278) = 12.35, p < .001$; head injury, $\chi^2(1, 278) = 7.87, p < .01$; and recent homelessness, $\chi^2(1, 278) = 16.22, p < .001$.

A cross-site multivariable model was created to examine the variables associated with violent behavior among veterans with SMI (Table 1). For veterans with SMI, the following factors

Table 1. Multivariable Model Predicting Violent Behavior in Veterans With Severe Mental Illness ($N = 278$)

Independent variables	OR	95% CI
Substance abuse	2.43*	(1.07–5.51)
Head injury	3.00**	(1.24–7.26)
PTSD (PCL \geq 45)	3.03*	(1.03–8.97)
Homeless in past 6 months	6.99***	(3.07–14.93)

Note. PTSD = Posttraumatic stress disorder; PCL = PTSD Checklist. $\chi^2(1, 278) = 60.1, p < .001$, pseudo $R^2 = 0.27$. Multivariate models control for the five sites using four dummy codes and are weighted according to population distributions using data from the National Institutes of Mental Health (NIMH) National Comorbidity Study.

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

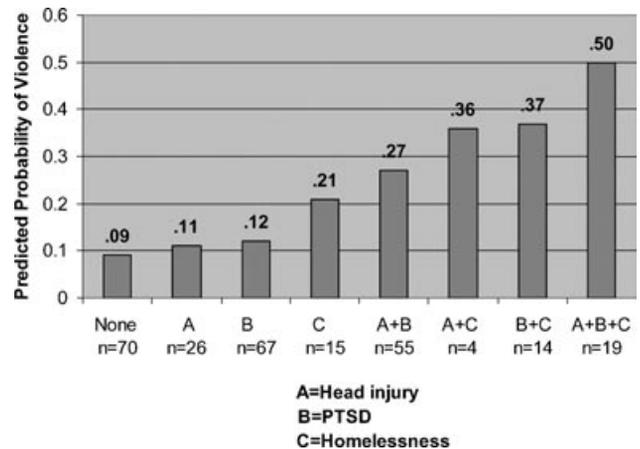


Figure 1. Predicted probability of violence by veterans with severe mental illness ($N = 278$) according to head injury (A), posttraumatic stress disorder (B), and homelessness (C).

were significantly associated with violence in the final multivariate model: substance abuse (OR = 2.43, CI = 1.07–5.51, $p < .05$), head injury (OR = 3.00, CI = 1.24–7.26, $p < .01$), PTSD (OR = 3.03, CI = 1.03–8.97, $p < .05$), and recent homelessness (OR = 6.99, CI = 3.07–14.93, $p < .001$).

Figure 1 illustrates the odds of violence as a function of the three most robust risk factors in the final model: homelessness, PTSD, and head injury. These findings illustrate that in the presence or endorsement of these three factors, the predicted probability of any violent behavior was .50 and the absence of these factors was associated with a greatly decreased probability of violent behavior (.09). Head injury and PTSD each alone had a .11–.12 predicted probability of violence; when combined, the predicted violence probability rose to .27.

CONCLUSION

Multivariate analyses indicated that violence by veterans with SMI was associated with head injury, PTSD, substance abuse, and homelessness. Although homelessness is a well-documented problem for veterans (Gamache, Rosenheck, & Tessler, 2001; O'Toole, Conde-Martel, Gibbon, Hanusa, & Fine, 2003), this study is the first to link unstable living circumstances to violence among a veteran sample. As in previous research on SMI (Swanson, Holzer, Ganju, & Jono, 1990) and veterans (McFall et al., 1999), substance abuse was linked to violence among veterans with SMI.

Consistent with other veteran studies, PTSD elevated risk of both domestic and interpersonal aggression (Begic & Jokic-Begic, 2001; Taft et al., 2005). The current study extends these findings by identifying PTSD as an independent risk factor for violent behavior in a psychiatric veteran sample with SMI. Although previous research shows that psychotic symptoms are often the

clinical focus of violence risk assessments of people with SMI (Elbogen, Huss, Tomkins, & Scalora, 2005), the current results underscore that it may be just as useful—if not more so—for clinicians to consider PTSD diagnosis when assessing the violence risk of veterans with SMI.

The current analyses also suggest clinicians assessing violence risk among veterans with SMI should consider a combination of characteristics empirically related to violence perpetrated by non-veterans with SMI (e.g., homelessness) and veterans populations in general (e.g., PTSD). In the current study, one in five veterans with SMI reported living instability, comparable to prevalence found in other research (Gamache et al., 2001). So, although addressing the sequelae of PTSD is paramount for assessing violence among veterans without SMI, additional steps may need to be taken to assure a stable living situation to optimally reduce the chances of violent behavior in the community.

Additionally, the results regarding PTSD combined with head injury are noteworthy to consider in clinical practice. Because each are associated with increased irritability, agitation, hyperarousal, and anger dysregulation (Byrne & Riggs, 1996; Grafman et al., 1996), study results imply that a veteran with SMI suffering from both conditions may have compounded symptoms that place them at elevated risk of aggressive behavior. Figure 1 shows more than double the risk of violence in the presence of PTSD and traumatic brain injury. As a result, interventions that address PTSD symptoms combined with cognitive rehabilitation techniques may be necessary to reduce these veterans' violence risk.

Although this study surveyed veterans from previous conflicts, the data are likely of particular relevance to treating veterans from Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Initial evidence shows significant mental health problems among Iraq and Afghanistan veterans, especially at risk of PTSD (Hoge, Auchterlonie, & Milliken, 2006) and traumatic brain injuries (Vasterling et al., 2006). Thus, the current findings suggests that violence risk assessment may be a routine practice among clinicians treating the newest generation of veterans.

As data were cross-sectional, causal ordering could not be established. Because treatment for SMI participants was a study requirement, data may not generalize to potentially more severely impaired untreated SMI patients. In addition, because SMI was a study inclusion criterion, the effect of other or no psychiatric disorder could not be examined. The survey relied on self-report alone in the report of violent acts and implies that our findings are probably conservative estimates of the true prevalence of violent behavior in persons with SMI. However, we found no evidence that the underreporting of violent acts was systematically related to any covariate in a way that would bias the findings on factors associated with violence.

In sum, the current study provided results suggesting veterans with SMI showed a combination of factors that research had previously demonstrated are related to violence among veterans

in general and among people with SMI. As a result, to develop effective means of reducing violence risk, the data attest to the need for further investigation to identify risk factors for violence more definitively, specifically among veterans with SMI. At the very least, the results indicate treatment providers assessing and managing violence risk of veterans with SMI need to consider a unique set of risk factors that capture both the patients' background in the military as well as the patient's current psychiatric diagnosis.

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