Protective Factors and Risk Modification of Violence in Iraq and Afghanistan War Veterans

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ABSTRACT

Objective: After returning home, a subset of Iraq and Afghanistan War veterans report engaging in aggression toward others. This study is the first to identify variables empirically related to decreased risk of community violence among veterans.

Method: The authors conducted a national survey from July 2009 to April 2010 in which participants were randomly drawn from over 1 million US military service members who served after September 11, 2001. Data were collected from a total of 1,388 Iraq and Afghanistan War era and theater veterans. The final sample included veterans from all 50 states and all military branches.

Results: One-third of survey respondents self-identified committing an act of aggression toward others during the past year, mostly involving minor aggressive behavior. Younger age, criminal arrest record, combat exposure, probable posttraumatic stress disorder, and alcohol misuse were positively related to violence toward others. Controlling for these covariates, multivariate analyses showed that stable living situation and the perception of having control over one's life were associated with reduced odds of severe violence ($R^2 = 0.24$, $\chi^2_7 = 145.03$, $P < .0001$). Greater resilience, perceiving positive social support, and having money to cover basic needs were linked to reduced odds of other physical aggression ($R^2 = 0.20$, $\chi^2_8 = 188.27$, $P < .0001$).

Conclusions: The study identifies aggression as a problem for a subset of Iraq and Afghanistan War veterans who endorsed few protective factors. Analyses revealed that protective factors added incremental value to statistical modeling of violence, even when controlling for robust risk factors. The data indicate that, in addition to clinical interventions directed at treating mental health and substance abuse problems, psychosocial rehabilitation approaches aimed at improving domains of basic functioning and psychological well-being may also be effective in modifying risk and reducing violence among veterans.

J Clin Psychiatry 2012;73(6):e767–e773

Submitted: *December 19, 2011; accepted April 18, 2012 (doi:10.4088/JCP.11m07593).*

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Over the past decade, there has been increasing media coverage of interpersonal violence perpetrated by Iraq and Afghanistan War veterans after they returned home from military service, particularly among those with possible mental health problems in need of psychiatric treatment. Many who served in Iraq and Afghanistan struggle with posttraumatic stress disorder (PTSD) and alcohol abuse,[1–3] which are the same problems that have consistently been associated with higher risk of post-deployment violence and aggression among veterans from previous conflicts.[4–9] Past research has also shown that violence committed by veterans is related to younger age, combat exposure, and history of criminal arrest,[4,10–13] raising the likelihood that these factors might also elevate risk among the current cohort of military service members. Research has started to indicate that aggression toward others may be a serious problem among a substantial proportion of Iraq and Afghanistan War veterans.[1,14–16]

In the wake of the Fort Hood shootings in 2009, the US Department of Defense published a report[17] strongly recommending development of effective violence risk reduction interventions in military populations. A first step toward pursuing this recommendation is identifying protective factors that are empirically associated with decreased risk of violence. Protective factors are defined as variables that modify, ameliorate, or alter a person's response to some hazard that predisposes a maladaptive outcome.[18] Although studies have examined factors that protect against aggression in children and adolescents, relatively little research has been published about protective factors that prevent violence in adults, among either civilians[19,20] or veterans.[11] In children and adolescents, positive social support, living stability, and strong commitment to school or work have been found to be associated with reduced violent and aggressive behavior.[21,22] Parallel research in adults would ideally uncover similar individual and/or environmental factors that modify and reduce odds of violence, even in the presence of risk factors.

A framework that is theoretically consistent with this objective is psychosocial rehabilitation. The psychosocial rehabilitation model for understanding and treating mental health problems encourages clinicians to focus on diagnosis in the context of treatment and the individual's competence in various domains of basic functioning (eg, financial management, ability for self-care) and well-being (eg, social, psychological).[23,24] The central tenets of this framework are to empower patients to set their own recovery goals and to actively collaborate with patients to achieve these goals.[25–27] Thus, treatment in this model involves reducing symptoms associated with a mental illness and teaching skills to improve functioning at home, at work, or in other social environments, with the goal of progressing patients toward recovery.[28–30]

Applying psychosocial rehabilitation to the examination of violence risk is congruent with empirical research demonstrating that environmental and contextual factors are significantly associated with aggression[19,31,32] and with evidence advocating client participation in the process of violence risk management as a means to improve outcomes.[33,34] It is also consistent with recent efforts by Veterans Affairs (VA) medical centers to integrate more rehabilitation interventions into the treatment of veterans diagnosed

Clinical Points

- A subset of veteran participants—those with few psychosocial protective factors—appears to be at higher risk for engaging in violence and other acts of physical aggression.
- Investigation of psychosocial protective factors would enhance clinicians' ability to assess veterans' risk of violence using an evidence-based and patient-centered approach.
- Rehabilitation focusing on improving basic functioning (living, financial, vocational) and well-being (resilience, social support) could help reduce violence in veterans.

with PTSD[25] and other psychological and physical injuries of the Iraq and Afghanistan War.[24,35,36]

As thousands of service members return home from combat, there will be an urgent need for clinicians to develop evidence-based approaches to assessing and reducing post-deployment violence. However, the scientific literature currently provides scant guidance for health professionals regarding effective interventions for reducing aggression when treating those who have served in the military, despite the fact that these problems are commonly encountered in clinical practice. To our knowledge, there are no studies documenting variables related to lower risk of community violence among veterans.[11,17]

To address this research gap, the current article reports on empirically supported protective factors in a national sample of Iraq and Afghanistan War era and theater veterans, using psychosocial rehabilitation as a conceptual framework. Empirical evidence from recent factor analyses yielded 2 categories for optimally classifying psychosocial functioning: basic functioning and well-being.[37] Basic functioning encompasses an individual's living stability, self-care abilities, vocational situation, and financial status. Given scholarship advancing the notion that stressful or impoverished environments increase violence risk,[31,32,38,39] we hypothesized that stronger basic functioning would be linked to lower rates of violence in veterans. Well-being includes issues of psychological resilience, self-determination, spirituality, and social support. Given psychological theories attributing aggression to emotional dysregulation,[40–43] we hypothesized that the aforementioned domains of well-being would be linked to lower incidence of aggressive behavior in Iraq and Afghanistan War veterans.

METHOD

Study Population

The sample of the National Institute of Mental Health–funded National Post-Deployment Adjustment Survey was drawn by the US Department of Veterans Affairs Environmental Epidemiology Service in May 2009 from a random selection of over 1 million US military service members who served after September 11, 2001, and were either separated from active duty or in the Reserves/National Guard. The sample was stratified by gender, and women veterans were oversampled. Of 3,000 names randomly selected, n = 63 had incomplete addresses or were deceased, n = 438 had incorrect addresses, and n = 1,111 were passive declines. In total, N = 1,388 completed the survey, yielding a 56% corrected-response rate. This rate is among the highest achieved in recent national surveys of US troops and comparable to studies in the United Kingdom.[2,3]

Responders and nonresponders did not differ by gender. States with the largest military populations showed similar patterns in response groups and corresponded to known military demographics. The mean ages were 36.1 years (SD = 10.1) for responders and 34.8 years (SD = 9.6) for the entire random sample. The distribution of responders according to military branch (52% Army, 18% Air Force, 16% Navy, 13% Marines, and 1% Coast Guard) closely approximated the composition of the US Armed Forces.[44] The distribution of the sample by race/ethnicity also mirrored the current military breakdown: 70% Caucasian and 30% African American, Hispanic, or other. The final sample included veterans from 50 states; Washington, DC; and 4 territories.

Procedure

After obtaining institutional review board approval, we used the Dillman method[45] to conduct a national survey. This approach uses multiple contacts to maximize response rate and varied contacts to increase effectiveness with nonrespondents. The survey was conducted from July 2009 to April 2010. Potential participants were first sent an introductory letter and a brochure from the VA Office of Research about the upcoming survey. Four days later, an invitation was mailed containing a password and instructions on how to complete a 35-minute confidential Web-based survey. This mailing also contained $4.40 in commemorative postage stamps as an incentive. Sixteen days after the invitations were mailed, potential participants were sent postcards thanking them for completing the survey or reminding them to do so. Two weeks after the postcard mailing, those who had not taken the survey received a paper version with a postage-paid return envelope. Two months after the print survey had been mailed; a final letter was sent encouraging participation and explaining that the survey would close the following week.

There were no differences between the online and print surveys in terms of content. Eighty percent of respondents completed the Web-based survey, and 20% completed the print version. Five hundred pilot surveys were used to identify potential technical problems. Pilot phase respondents (15% of the analytic sample) received $40 reimbursement, and those who completed the survey during the remainder of the study period (85% of the sample) were reimbursed $50. Other than reimbursement rate, procedures were identical for both phases of the survey. Subsamples were compared on demographic and clinical characteristics to assess differences

in survey medium and reimbursement rate; no significant differences were detected with Bonferroni adjustment for multiple comparisons.

Measures

Protective factors. Basic function domains—work, financial, self-care, and living—were operationalized as follows. Work was defined as current full-time or part-time employment (0 = no; 1 = yes). Financial status was based on responses to items from the Quality of Life Interview[46] that asked if respondents have enough money to cover basic needs including food, clothes, shelter, medical care, and transportation (0 = not meeting all needs; 1 = meeting all needs). Self-care was operationalized using the Quality of Life Index[47] by measuring veterans' reported degree of satisfaction with their ability to care for themselves without help (0 = not satisfied; 1 = satisfied). Living stability was assessed on the basis of reported homelessness within the past year (0 = no; 1 = yes).

Domains of well-being—resilience, self-determination, spiritual, and social support—were operationalized as follows. Resilience was measured with the Connor-Davidson Resilience Scale,[48] which examines an individual's ability to cope with stress and adapt to change (0 = below median; 1 = at or above median). Items on the Quality of Life Index[47] measured veterans' perceptions of self-determination ("the amount of control you have over your life"), spirituality ("your faith in God"), and social support ("the emotional support you get from family/friends") (0 = not satisfied; 1 = satisfied).

Violence and aggression. Participants were prompted to report on other-directed violence/aggression within the past year that occurred in the community. Severe violence in the past year was measured by endorsement of specific items on the Conflict Tactics Scale[49] (ie, "used a knife or gun," "beat up the other person," or "threatened the other person with a knife or gun") or on the MacArthur Community Violence Scale[50] (ie, "Did you threaten anyone with a gun or knife or other lethal weapon in your hand?" "Did you use a knife or fire a gun at anyone?" or "Did you try to physically force anyone to have sex against his or her will?") (0 = no severe violence; 1 = severe violence). Other physical aggression in the past year was assessed using additional items on these scales that addressed physical aggression (ie, kicking, slapping, using fists, and getting into fights) (0 = other physical aggression not endorsed; 1 = other physical aggression endorsed).

Covariates. Covariates were selected on the basis of robust risk factors of violence in veteran populations.[11] These factors included veterans' age and self-reported history of arrest. Combat exposure was measured with a scale from the Neurocognition Deployment Health Study[51] (1 = at or above median/more combat; 0 = below median/less combat). Probable PTSD was measured with the Davidson Trauma Scale (DTS),[52] which rates past-week frequency and severity of *DSM-IV* PTSD symptoms (reexperiencing, avoidance, hyperarousal) related to a specific trauma. DTS scores over 48 are associated with a sensitivity of 0.82, a specificity of 0.94, and a diagnostic efficiency of 0.87 in designating the presence of PTSD in Iraq and Afghanistan War veterans using the Structured Clinical Interview for *DSM-IV*[53] (0 = DTS score ≤ 48; 1 = DTS score > 48). The Alcohol Use Disorders Identification Test (AUDIT) was also included in the assessments; it is a screen to identify individuals with hazardous and harmful patterns of alcohol misuse, and a cutoff score of 7 has been validated for *DSM-IV* diagnosis of alcohol use disorder (0 = AUDIT score ≤ 7; 1 = AUDIT score > 7).[54]

Analysis

SAS 9.2 (SAS Institute Inc; Cary, North Carolina) was used for all statistical analyses. Univariate analyses describing sample characteristics were weighted by gender to adjust for oversampling. Women constituted 33% of the current sample but represent an estimated 15.6% of the military, based on September 2009 Defense Manpower Data Center figures[44]; data in the current study were weighted to reflect the latter proportion, which adjusted the total sample to a weight-adjusted sample of n = 1,102. Chi-square analyses were used to evaluate bivariate associations. Multiple logistic regression was conducted to evaluate the association between protective factors and the 2 measures of violence/aggression. Data were reduced by using stepwise procedures to obtain more parsimonious models; exclusion criteria were set at $P < .05$. Predicted probabilities of severe violence were generated as a function of (1) the number of protective factors endorsed by veteran respondents and (2) absence or presence of individual protective factors among veterans with higher combat exposure (≥ median).

RESULTS

The median age of study participants was 33 years. Sixty-one percent of participants were married, and 81% had some post–high school education. The median annual income was $50,000, and 78% of the sample reported some current employment. Five percent of respondents indicated that they had been homeless for at least 1 day in the prior year, and 12% reported criminal arrests that occurred before they returned home from their last deployment.

Forty-eight percent of participants were the Reserves or National Guard, 80% were enlisted ranks (E1-E7), and 15% were commissioned officers (O1-O7). Fifty-six percent had been deployed to Iraq or Afghanistan once, 20% had been deployed twice, and 7% had been deployed 3 or more times. The average time since last deployment in the military was 4.5 years. Clinically, 20% of respondents met criteria for probable PTSD, and 27% screened positive for alcohol misuse.

In total, 33% of the sample indicated that, in the past year, they committed at least 1 act of non–combat-related violence or aggression toward others in the community. In terms of severity, 11% of the sample met criteria for engaging in acts of severe violence.

Table 1. Bivariate Associations Between Protective Factors and Violence/Aggression Among Iraq and Afghanistan War Veterans

	Weighted	Severe Violence				Other Physical Aggression			
	n	n	%	χ^2	*P* Value	n	%	χ^2	*P* Value
Basic functioning									
Work part-time or full-time									
Yes	862	77	8.96	13.43	.0002	254	29.55	15.03	.0004
No	239	41	17.25			102	42.80		
Basic needs met									
Yes	646	47	7.33	19.29	<.0001	148	22.93	64.61	<.0001
No	455	71	15.65			209	45.95		
Self-care									
No	114	23	23.14	20.27	<.0001	56	49.46	16.81	<.0001
Yes	988	92	9.34			301	30.47		
Homeless in past year									
No	1,051	100	9.52	36.87	<.0001	324	30.86	26.16	<.0001
Yes	50	18	36.6			33	65.35		
Well-being									
Resilience									
Above median	562	45	8.10	8.49	.0036	127	22.61	50.76	<.0001
Below median	538	73	13.55			230	42.71		
Self-determination									
Satisfied	926	77	8.33	35.87	<.0001	265	28.65	38.00	<.0001
Not satisfied	176	42	23.60			92	52.38		
Spiritual faith									
Satisfied	881	82	9.3	9.97	.0016	259	29.34	19.29	<.0001
Not satisfied	220	37	16.7			99	44.82		
Social support									
Satisfied	654	46	7.06	23.04	<.0001	161	24.68	44.28	<.0001
Not satisfied	447	72	16.19			195	43.79		

Table 2. Multivariate Models of Protective Factors and Violence/Aggression Among Iraq and Afghanistan War Veterans, Controlling for Risk Factor Covariates

	Severe Violence[a]			Other Physical Aggression[b]		
	Odds Ratio	95% Confidence Interval	*P* Value	Odds Ratio	95% Confidence Interval	*P* Value
Covariates						
Age	0.95	0.93–0.98	.0003	0.97	0.95–0.99	<.0001
History of arrest	1.70	1.07–2.71	.0259	1.60	1.13–2.26	.0090
Combat exposure	3.00	1.85–4.86	<.0001	1.71	1.27–2.29	.0026
Alcohol misuse	2.00	1.28–3.11	.0023	1.61	1.18–2.22	.0024
PTSD	1.93	1.21–3.07	.0054	1.82	1.28–2.60	.0120
Basic functioning						
Work			NS			NS
Basic needs met			NS	0.62	0.44–0.85	.0023
Self-care			NS			NS
Homeless in past year	2.05	1.00–4.19	.0488			NS
Well-being						
Resilience above median			NS	0.68	0.50–0.93	.0161
Self-determination	0.56	0.35–0.92	.0208			NS
Spiritual faith			NS			NS
Social support			NS	0.71	0.52–0.97	.0317

[a]Severe violence, final model: $R^2 = 0.24$, AUC = 0.82, $\chi^2_7 = 145.03$, $P < .0001$.
[b]Other physical aggression, final model: $R^2 = 0.20$, AUC = 0.75, $\chi^2_8 = 188.27$, $P < .0001$.
Abbreviations: AUC = area under the curve, NS = nonsignificant, PTSD = posttraumatic stress disorder.

Table 1 shows bivariate relationships between violence/aggression and conceptualized protective factors. In all instances, the associations between protective factors and reported violence were statistically significant and conformed directionally to expectations.

Table 2 presents the derived multivariate models for each of the 2 violence outcomes. The final model for severe violence was significant ($R^2 = 0.24$, $\chi^2_7 = 145.03$, $P < .0001$). Increased odds of severe violence were associated with age, combat exposure, alcohol misuse, criminal arrests, PTSD, and homelessness. Decreased odds were related to older age and increased perceptions of self-determination (perceived control over one's life).

The final model for other physical aggression was also significant ($R^2 = 0.20$, $\chi^2_8 = 188.27$, $P < .0001$). Increased odds of other physical violence were associated with history of arrest, combat exposure, alcohol misuse, and probable PTSD; decreased odds were associated with older age, satisfactory social support, higher resilience, and being able to cover basic needs.

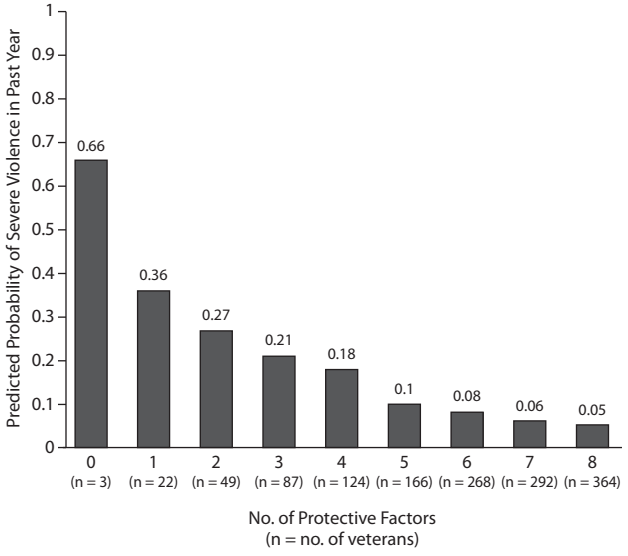
Figure 1 presents predicted probabilities of severe violence in the past year as a function of cumulative count of the protective factors outlined above. For participants with positive functioning in all domains (presence of the highest number of protective factors), the predicted probability of severe violent behavior was $P = .05$, increasing to a maximum of $P = .66$ for participants with no protective factors.

Figure 2 presents predicted probabilities of severe violence in the past year as a function of absence vs presence of individual protective factors among veterans with higher combat exposure. Chi-square analyses showed that 7 of the 8 protective factors were associated with significantly reduced odds of severe violence in this cohort of veterans.

DISCUSSION

Consistent with and expanding upon previous research,[1,14] one-third of the Iraq and Afghanistan War veterans sampled in this national study reported difficulty with aggression in the previous year, with 11% of the sample reporting having engaged in severe acts of violence in the community within the past year. Factors associated with violence among veterans from previous eras[11]—younger age, PTSD, alcohol abuse, and past criminal arrests—were also found to have significant associations in the current sample, consistent with recent research.[15,16] Multivariate analyses indicated that, even when these risk factors were controlled as covariates, a stable living situation and the perception of having control over one's life were independently associated

Figure 1. Predicted Probability of Severe Violence as a Function of Cumulative Protective Factors in Entire Sample of Veterans[a]



[a]Protective factors included resilience, meeting basic needs, employment, living stability, social support, spiritual faith, ability to care for oneself, and perceived self-determination.

with reduced odds of severe violence. Positive social support and having enough money to cover basic needs were associated with reduced odds of other forms of physical aggression. Thus, protective factors added incremental value to statistical modeling of violence, over and above use of risk factors alone.

The findings on protective effects of living, working, and social environments are consistent with research on violence risk among civilians, which has shown that situational factors increasing stress and vulnerability are significantly linked to violence.[31,32,38,39] In this way, our analyses resembled findings from a recent study[55] of violence in Army soldiers that were consistent with the diathesis-stress model, which posits that stressful situations can activate predispositions into the presence of psychopathology and/or negative behavioral outcomes.[56] The data also suggest that veterans who perceive that they have control over their future and who have greater psychological resilience may have greater internal motivation to refrain from violence and be better able to refrain from acting on aggressive impulses, consistent with several psychological theories of aggression.[40–43]

The results demonstrate that protective factors play a vital role in understanding violence in veterans. In Figure 1, we see that a subset of veteran participants—those with few protective factors—appeared to be at higher risk for engaging in violence. This means that the majority of veterans in our sample possessed most of the selected protective factors and was at relatively lower risk of violence. Figure 2 shows that inquiry into the effects of combat exposure should consider that violence does not occur in a vacuum but rather in the context of a veteran's social environment and psychological well-being. Indeed, one notices that some of the protective factors (living stability, employment, social support, self-direction, basic needs met) are present when service members live on a military base but are not necessarily present when service members return home. Thus, developing protective factors in the community can be seen as a necessary part of post-deployment adjustment.

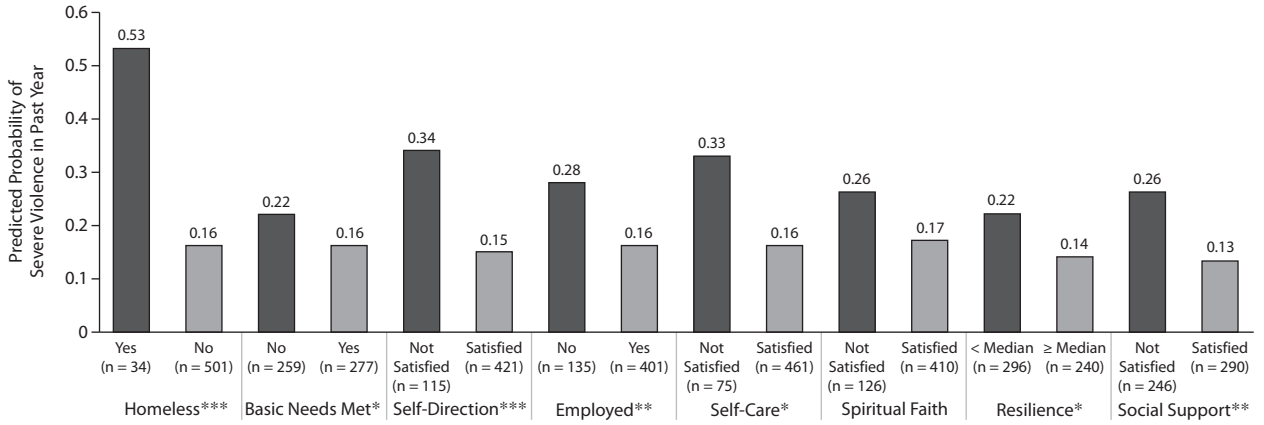
For these reasons, investigation of psychosocial protective factors could assist clinicians working with veterans. Collecting data from veterans about protective factors may be more feasible and carries less stigma for the veteran than direct inquiries about history of violence or criminal behavior. Organizing risk assessment interviews to inquire about the presence of protective factors early in the clinical evaluation may enhance cooperation and facilitate rapport. Consistent with patient-centered health care delivery principles, this process can be done collaboratively between the clinician and the veteran and encourages the veteran to play a central role in determining how he or she can work to decrease violence risk. Needs in the area of protective factors are quantifiable, and practical interventions are likely to be more easily understood by veterans and providers.

The data suggest that, in addition to treating mental health and substance abuse problems, rehabilitation approaches to reduce violence risk among veterans should focus on maintaining or improving basic functioning (living, financial, vocational) and well-being (social, psychological). This may be as effective as mental health treatment in reducing violence. VA providers have already started to address poor coping skills, homelessness, lack of social support, and unemployment[24,25,35,36] in an effort to increase veteran resilience. That many veterans reported not working may signal a need to boost vocational rehabilitation and work placement efforts. Still, it should be noted that some of the veterans in our sample who were not employed may have been enrolled in school full-time. Regardless, the data underscore that job retraining and education is likely a valuable avenue for reducing post-deployment adjustment problems. Current findings also support continuing and extending these types of interventions as promising methods for reducing the likelihood of violence among veterans.

To our knowledge, large-scale epidemiologic studies have not employed the types of psychometrically developed measures of violence used in the current study. These measures may be more sensitive in detecting violence, making it difficult to compare the current results with civilian data. Although the presented data do not provide definitive prevalence estimates of post-deployment violence, they do establish that the potential for aggression remains a significant concern among returning veterans.

Measurement of violence obtained from collateral sources may have enhanced the data but was not feasible given the current sampling frame. The cross-sectional design employed limits causal interpretation of data; future research should examine protective factors longitudinally. The breadth of participants who had served in Iraq and Afghanistan—representing 50 states, all branches of the

Figure 2. Association of Individual Protective Factors and Predicted Probability of Severe Violence in Subsample of Veterans With Higher Combat Exposure (≥ median)



*$P < .05$, *$P < .01$, **$P < .001$.

military, and multiple ethnicities—argues for the external validity of the current survey, which to our knowledge may be one of the most representative to date of post-9/11 US military veterans.

Within the factors we examined, there may be specific components of each factor (eg, work) that should be investigated further (eg, type of career, employment stability, job satisfaction). Creating a composite variable of violence has the benefit of permitting statistical power to analyze aggressive and violence behaviors but at the same time limits specifying particular types of violence or aggression (eg, dangerous or impulsive driving). Future research is also needed to determine if rates and/or types of violence may vary based on target (eg, family versus stranger). Findings recently published on structured clinical approaches to examining protective factors among civilians[20] are consistent with the current results on veterans. This suggests that future research efforts combining protective factors into validated assessment tools for clinicians may be useful to guide risk modification of veterans. The study of risk and protective factors among various veteran diagnostic subgroups, including those with PTSD, traumatic brain injury, and other specific mental health disorders, may further inform the treatment planning process.

The current study takes a preliminary step toward uncovering potential protective factors to modify and reduce risk of violence and aggression among veterans. Current results underscore the importance of developing empirically supported violence risk assessment tools and evidence-based interventions for Iraq and Afghanistan War veterans. It also supports DOD and VA use of a psychosocial rehabilitation model for care.[23,25,36] This study indicates that risk of aggression among veterans can be further reduced by assisting veterans to develop and maintain specific psychosocial protective factors in their lives. Rehabilitation efforts that target multiple domains of functioning may offer hope of recovery to veterans with post-deployment adjustment problems including aggression or violence.

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Potential conflicts of interest: None reported.
Funding/support: Preparation of this manuscript was supported by the National Institute of Mental Health (R01MH080988), the Office of Research and Development Clinical Science, Department of Veterans Affairs, Durham VA Medical Center, and the Mid-Atlantic Mental Illness Research, Education and Clinical Center.
Disclaimer: The views expressed in this article are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs or the National Institutes of Health.
Acknowledgment: The authors extend their sincere thanks to the participants who volunteered for this study.

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