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Protective Mechanisms and Prevention of Violence and Aggression in Veterans

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Abstract

Although a subset of Iraq and Afghanistan Veterans show aggression toward others after they return home from military service, little is known about protective mechanisms that could be bolstered to prevent violence. A national longitudinal survey was conducted between 2009 and 2011 using a random sample of veterans who served in Operation Iraqi Freedom or Operation Enduring Freedom. One thousand ninety veterans, from 50 states representing all military branches, completed two waves of data collection, one-year apart (retention rate=79%). The final sample resembled the U.S. military post 9/11 in terms of age, sex, ethnicity, geography, and service branch. Protective mechanisms in socioeconomic (money to cover basic needs, stable employment), psychosocial (resilience, perceiving control over one's life, social support), and physical (healthy sleep, no physical pain) domains were examined. We found these protective mechanisms predicted decreased aggression and violence at follow-up, particularly with higher risk veterans. Multivariable analyses confirmed protective mechanisms lowered violence through their interaction with risk factors. This study identifies protective mechanisms related to decreased community violence in veterans and indicates that rehabilitation aimed at improving

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socioeconomic, psychosocial, and physical well-being has potential promise to reduce aggression and violence among veterans after returning home from military service.

Keywords

violence; aggression; protective factors; veterans; rehabilitation

A number of empirical studies now document that aggressive or violent behavior toward others is a problem up to one-third of Iraq and Afghanistan Veterans returning home from military service (Jakupcak et al., 2007; Killgore et al., 2008; Sayer et al., 2010; Teten et al., 2010; Thomas et al., 2010). Many veterans are suffering from posttraumatic stress disorder (PTSD), traumatic brain injury (TBI), or substance abuse (Burnett-Zeigler et al., 2011; Fear et al., 2010; Hoge et al., 2004; Seal et al., 2009; Tanielian & Jaycox, 2008; Thomas, et al., 2010), all of which have been found to be associated with higher aggression/violence among veterans from previous conflicts (Beckham, Feldman, Kirby, Hertzberg, & Moore, 1997; Beckham, Moore, & Reynolds, 2000; Freeman & Roca, 2001; Frueh, Turner, Beidel, & Cahill, 2001; Grafman, Schwab, Warden, & Pridgen, 1996; Lasko, Gurvits, Kuhne, Orr, & et al., 1994; McFall, Fontana, Raskind, & Rosenheck, 1999; Orcutt, King, & King, 2003; Savarese, Suvak, King, & King, 2001; Taft et al., 2005). After the mass shooting at Fort Hood in 2009 by an Army Major, the U.S. Department of Defense (DOD) publicly encouraged the development of strategies to prevent violence perpetrated by military service members (DOD, 2010); however, the scientific literature has yet to provide any guidance on how to effectively manage the problem of aggression and violence among veterans (DOD, 2010; Elbogen, Fuller, et al., 2010).

One approach to mitigate violence among veterans would be to identify protective mechanisms that can be modified. Conceptualization of protective mechanisms can be based on the psychosocial rehabilitation model, which encourages interventions focused on both treatable symptoms and competence in various domains of basic functioning and psychosocial and physical well-being (Cattelani, Zettin, & Zoccolotti, 2010; Glynn et al., 2009). The central tenets of this framework involve empowering individuals to set their own recovery goals and promoting active collaboration between individuals and intervention agents (Penk, Flannery, Foa, Keane, & Friedman, 2000; Schutt et al., 2003; Spaulding, Sullivan, & Poland, 2003). Interventions involve reducing behavioral health symptoms and teaching skills to improve functioning at work, home, or social environments (LePage et al., 2006; Martz, Bodner, & Livneh, 2009; Penk et al., 2010).

Applying psychosocial rehabilitation toward examining violence in the military is congruent with empirical research which has demonstrated that environmental and contextual factors are significantly associated with aggression (Elbogen & Johnson, 2009; Silver & Teasdale, 2005; Swanson et al., 2002; Ullrich & Coid, 2011) and with scholarship advocating client participation in the process of violence risk management as a means to improve outcomes (Elbogen, Van Dorn, Swanson, Swartz, & Monahan, 2006; Heilbrun, 1997). It is also consistent with recent efforts by the DOD to integrate psychosocial rehabilitation interventions including Master Resilience Training into treatment of service members

suffering from PTSD and other psychological and physical injuries incurred during the Iraq and Afghanistan War (Reivich, Seligman, & McBride, 2011; Seligman & Fowler, 2011). Using conceptual definitions of recovery (SAMHSA, 1999; SAMSHA, 2011) and major domains of rehabilitation currently implemented with military veterans (Armstrong, 2010; Cattelani, et al., 2010; Goldberg & Resnick, 2010; Manderscheid, 2007; Penk, et al., 2010; Reivich, et al., 2011; Seligman & Fowler, 2011), several overarching domains of protective mechanisms can be hypothesized, including: 1) socioeconomic functioning (e.g., vocational rehabilitation); 2) psychosocial well-being (e.g., resilience training); and 3) physical health (e.g., pain management).

However, there is relatively little research has been published about protective mechanisms in adult populations, either among civilians (de Vries Robbe, de Vogel, & de Spa, 2011; Ullrich & Coid, 2011) or veterans (DOD, 2010; Elbogen, Fuller, et al., 2010). Still, many studies have examined risk/protective factors for violence in juvenile populations (Borum & Verhaagen, 2006; Lodewijks, de Ruiter, & Doreleijers, 2010). Thus, to guide analyses of protective mechanisms in adults, we can apply methodology from research on protective mechanisms among youth was used to guide analyses (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Resnick, Ireland, & Borowsky, 2004; Rutter, 1987). In particular, Rutter (1987) argues that for a variable to qualify as a protective mechanism, it must interact with risk variables such that there is little-to-no protective effect in a low-risk population but a significant protective effect in a high-risk population: “protective effect is evident only in combination with the risk variable…either [the protective mechanism] has no effect in low-risk populations or its effect is magnified in the presence of the risk variable. It is crucial that this interactive component be put to rigorous empirical test.” (Rutter, 1987). In other words, it makes less sense to call a factor ‘protective’ for a group of individuals who are already at very low risk. Rather, protection occurs when high risk individuals possess characteristics or mechanisms that actually reduce risk.

Applied to Iraq and Afghanistan Veterans, one would hypothesize that the presence of socioeconomic, psychosocial, and physical protective mechanisms at time point 1 should translate to reduced rate of violence at time point 2, particularly for veterans who were at high risk at time point 1. Such research would thus point to specific interventions for clinicians to help manage risk among veterans presenting with problems controlling violence, aggression, or anger. Although more than 70 studies have been published examining violence in veteran and military populations (Elbogen, Fuller, et al., 2010), there is only one manuscript to our knowledge that has examined variables related to reduced risk in this population (Elbogen et al., 2012). However, this paper was cross-sectional and could not determine if protective factors led to reduced violence, or vice versa. Further, analyses were limited to psychosocial factors, whereas recent work indicates a potential for physical factors (e.g., pain, sleep) to play a protective role in veterans (Elbogen, Wagner, et al., 2010; Martz et al., 2009). For these reasons, the current paper reports on whether socioeconomic, psychological, and physical protective mechanisms are associated with reduced community violence in a national longitudinal sample of Iraq/Afghanistan War era Veterans.

Method

Participants

The National Post-Deployment Adjustment Survey sample was drawn by the U.S. Department of Veterans Affairs (VA) Environmental Epidemiological Service in May 2009 by a random selection from a roster developed by Defense Manpower Data Center of all U. S. military service members who served after September 11, 2001 in Operation Iraqi Freedom or Operation Enduring Freedom and had either separated from active duty or were in the Reserves/National Guard. The sample was stratified by gender, and women veterans were oversampled to ensure adequate representation. Specifically, we drew a list of 1000 women randomly selected from all women veterans in the roster and a list of 2000 men randomly selected from all male veterans in the roster. Wave 1 of the survey was implemented from July 2009 to April 2010 and yielded a 47% response rate and 56% cooperation rate, which is comparable to, or greater than, that achieved in other national surveys of veterans (Beckham et al., 2008; Tanielian & Jaycox, 2008; Vogt et al., 2011).

Wave 2 was conducted one year later from July 2010 to April 2011. *N*=1090 veterans completed surveys at both Waves 1 and 2, yielding a 79% retention rate. Median age of the sample was 33 years. Military branch of the sample approximated the actual composition of the military (55.21% Army, 19.92% Air Force, 14.88% Navy, 9.64% Marines, and 0.35% Coast Guard). The majority (82%) had been deployed to Iraq or Afghanistan, time since last deployment ranged from 1 to 8 years with a median of 4 years. The remainder of the sample was composed of veterans who served in Operation Iraqi Freedom or Operation Enduring Freedom but were not stationed in the theater of combat. Ethnicity of the final sample in the current study (27.35% non-white) also resembled the military (Defense Manpower Data Center, 2010). The final sample was geographically representative of the military and corresponded to known demographics regarding the post-9/11 U.S. military population. Veterans resided in 50 states, Washington D.C., and 4 territories in very close to the same proportion as the military.

Procedure and Materials

After Institutional Review Board approval was obtained, veterans were surveyed using Dillman survey methodology (Dillman, Smyth, & Christian, 2009), which involves multiple and varied contacts to maximize response rate. Both Waves 1 and 2 of data collection involved similar procedures, and participants were reimbursed after completing each wave.

In Wave 1, participants were first sent an introductory letter about the upcoming survey. Four days later, they were sent an invitation by mail, which contained commemorative postage stamps as an incentive and instructions on how to complete a 35-minute confidential web-based survey. 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.

In Wave 2, participants who completed Wave 1 received the same letters, incentives, reminders, and reimbursements with the exception of the introductory letter which was deemed unnecessary since participants had already completed the survey one year earlier. In terms of survey medium, 83.46% of the sample completed data collection online and 16.54% completed the paper version. There were no differences between web vs. paper versions with respect to risk factors described below.

For the current study, we used data on protective mechanisms and risk factors collected at the initial survey (Wave 1) as the independent variables. With respect to the former, we collected data on three domains. First, socioeconomic functioning was measured by the following: Stable work as defined by current full-time or part-time employment and no report of being fired or laid off in the past year (1=yes; 0=no); and meeting basic needs as measured with the Quality of Life Interview (Lehman, 1983), which asks respondents if they have enough money to cover food, clothes, shelter, medical care, transportation, and social activities (1=meeting all needs; 0=not meeting all needs).

Second, psychosocial well-being items included: Resilience as measured by the Connor-Davidson Resilience Scale (CD-RISC) (Connor, 2003) which examines an individual's ability to cope with stress and adapt to change (1=top quartile; 0=below top quartile); self-determination ("the amount of control you have over your life"); and social support ("the emotional support you get from family/friends") as measured using the Quality of Life Index (Ferrans & Powers, 1992) (1=moderately or very satisfied; 0=other).

Third, physical health items included: Sleep as measured on the Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2001) item "trouble falling or staying asleep, or sleeping too much" over the past two weeks (1=none at all; 0=other); pain ("the amount of pain you have"); and self-care ("your ability to take care of yourself without help") as reported on the Quality of Life Index (Ferrans & Powers, 1992) (1=moderately or very satisfied; 0=other).

Risk Factors were selected based on robust predictors of violence in veterans populations (Elbogen, Fuller, et al., 2010). Eight key risk factors were identified, including veterans' age, self-reported history of witnessing family violence and history of past criminal arrest (1=yes; 0=no). Combat exposure was measured with a scale from the Neurocognition Deployment Health Study (King, King, & Vogt, 2003) (1=at or above median/more combat; 0=below median/less combat).

Probable PTSD was measured with the Davidson Trauma Scale (DTS) (Davidson, 1997), which rates past-week frequency and severity of DSM-IV PTSD symptoms (i.e., reexperiencing, avoidance/numbing, 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 Diagnosis (McDonald, Beckham, Morey, & Calhoun, 2009) (1=DTS>48; 0=DTS≤48;). Loss of consciousness (LOC) associated with a TBI was measured by self-report (0=No LOC reported; 1=LOC from TBI). Alcohol misuse was measured with the Alcohol Use Disorder Identification Test

(Bradley & Bush, 1998) (cutoff score=7). Drug misuse was measured with the Drug Abuse Screening Test (Skinner, 1982) (cutoff score=2).

For the current study, we used data on violence and aggression collected at the one year follow-up survey (Wave 2) as the dependent variable. Violence and aggression in the past year (community-based and non-military related) was measured with the Conflict Tactics Scale (Straus, 1979) and the MacArthur Community Violence Scale (Steadman et al., 2000). Endorsement on either of these two scales of any physically aggressive act toward others or threat with a lethal weapon was operationalized as any aggression/violence (1=yes; 0=no).

Results

SAS 9.2 was used for all statistical analyses. Women constituted 33% of the current sample but represent an estimated 15.6% of the military, based on September 2009 military demographic statistics (Defense Manpower Data Center, 2010). Data in the current study were weighted to reflect the latter proportion in order to be representative of the military, which adjusted the total sample to a weight-adjusted follow-up of n=866.

Univariate analyses were used to describe the sample. The sample is described in Table 1. Between the initial and follow-up assessments, 27% of veterans reported acts of aggression or violence, the majority of which involved minor aggression. Chi-square procedures were employed to examine bivariate associations between risk factors at initial assessment and violence/aggression at follow-up. Table 2 shows substantial positive bivariate associations between each risk factor at initial assessment and aggression/violence at follow-up.

Because relatively little research has been published about protective mechanisms in adult civilian (de Vries Robbe, et al., 2011; Ullrich & Coid, 2011) or veteran (DOD, 2010; Elbogen, Fuller, et al., 2010) populations, methodology from research on youth violence was used to guide current analyses (Jessor, et al., 1995; Loeber & Farrington, 1998; Resnick, et al., 2004; Rutter, 1987). Using Rutter's aforementioned definition of protective mechanisms, we conducted analysis to determine if a putative protective mechanism either had an effect on higher-risk but not lower-risk individuals or had its effect magnified among those at higher-risk.

To examine this in the current study, a dichotomous variable was created denoting median level of risk at initial assessment: lower-risk (fewer than two risk factors; at or below the median) and higher-risk (two or more risk factors; above the median) (Loeber & Farrington, 1998). Accordingly, bivariate associations between putative protective mechanisms at initial assessment and aggression/violence at follow-up were estimated using chi-square procedures for both lower and higher-risk cohorts.

In order to best illustrate this, we dichotomized protective mechanisms as described above, which also allowed us to better ensure that a veteran did, or did not, possess a certain protective mechanism (e.g., using the top quartile of CD-RISC scores to connote the presence of psychological resilience). Using the aforementioned dichotomized coding, Table 3 demonstrates clearly that the variables selected in this study meet Rutter's criteria for protective mechanisms. Most protective mechanisms *were not* significantly associated with

violence at follow-up in the lower-risk group but *were* significantly associated with violence at follow-up in the higher-risk group (resilience, perceived self-determination, social support, self-care, employment). Several protective mechanisms that were associated with reductions in violence among the lower-risk cohort proved to have even more powerful effects in the higher-risk group (meets basic needs, no pain, healthy sleep).

Multiple logical regression analyses were conducted to further examine the interaction between risk and protective variables. First, violence at follow-up was regressed on: (a) level of risk at initial assessment; (b) a cumulative measure of protective mechanisms at initial assessment, in accordance with past research (Jessor, et al., 1995); and (c) the interaction between a and b.

Table 4 shows that the addition of an interaction term crossing level of risk with protective mechanisms significantly increased model fit, indicating that the reduction in violence associated with protective mechanisms was cumulative and occurred differentially among veterans in the higher-risk cohort. As estimated, the decrease in odds of violence at follow-up associated with endorsement of a protective mechanism among lower-risk veterans was 11% (Odds Ratio = 0.890), reduction among veterans in the higher-risk cohort was greater than 25% (Odds Ratio = 0.745).

A second set of analyses was conducted regressing violence at follow-up on cumulative protective mechanisms, stratified by lower vs. higher-risk. The differential effect found right above can also be seen in the two stratified models. Among veterans in the lower-risk cohort, the reduction in odds associated with endorsement of protective mechanisms was small and non-significant; however, this effect more than doubled and was significant in higher-risk veterans.

Validation of models used bootstrap methodologies based on 1000 replications. Bias was calculated as the difference between model-estimated coefficients and corresponding bootstrap counterparts; percent bias was subsequently calculated as the ratio of bias relative to the estimated model coefficient. All models in Table 4 were validated with bootstrap methodologies and showed little evidence of shrinkage in the original estimates, indicating bias estimates for most coefficients less than 2%.

These models were re-estimated on the subset of participants who were deployed to Iraq and Afghanistan to ascertain if findings generalized from era to theater veterans and to examine if time since last deployment related to outcomes. Analyses showed a significant Risk Level X Protective Mechanisms interaction ($\beta=-0.2255$, $p=.02$), similar to that found in the entire sample. The stratified model also yielded comparable results: protective mechanisms had no effect for those at lower-risk ($\beta=-0.0106$, $p=.40$) but had significant effect on decreasing violence among those at higher-risk ($\beta=-0.2954$, $p<.0001$). Time since deployment had a non-significant association to aggression/violence in these models.

Lastly, to illustrate the cumulative effect of different levels of protective mechanisms (Resnick, et al., 2004), predicted probabilities of follow-up aggression/violence were generated as a function of the number of protective mechanisms at initial assessment within the higher-risk (2 or more risk factors) cohort. Figure 1 illustrates the effect of protective

mechanisms on predicted probability of any aggression/violence at follow-up among veterans with multiple risk factors. In this group, those endorsing selected protective mechanisms had a .16 predicted probability for committing an aggressive act within the following year, whereas those who did not endorse protective mechanisms had a 0.66 predicted probability.

Discussion

Aggression is a serious problem for a subset of Iraq/Afghanistan War era Veterans. These analyses are the first to examine longitudinally the effect of protective mechanisms on violence in veterans. Factors associated with violence in cross-sectional studies of veterans from previous eras—younger age, past criminal arrests, combat exposure, PTSD, LOC with TBI, alcohol and drug abuse—were shown to have significant longitudinal associations in the current sample. Protective mechanisms were identified to play a vital role in understanding and preventing violence post-deployment. More specifically, analyses indicated that reductions in violence associated with protective mechanisms were cumulative and occurred differentially among veterans at a higher level of risk. In the higher-risk group, the presence of protective mechanisms was associated with a reduction in aggression/violence of up to 76% (Figure 1).

This study provides preliminary empirical support that several possible pathways to violence among veterans could be interrupted by practical interventions. 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 (Silver & Teasdale, 2005; Steadman, 1982; Swanson, et al., 2002; Ullrich & Coid, 2011). This suggests that interventions that reduce homelessness, retrain veterans for civilian work, enhance financial literacy, and improve social support are all likely to reduce the risk of violence among veterans, with the greatest impact likely to be seen on those veterans with the highest number of risk factors (Cattelani, et al., 2010; Goldberg & Resnick, 2010; LePage, et al., 2006; Manderscheid, 2007; Martz, et al., 2009; Penk, et al., 2010; Schutt, et al., 2003).

The data also suggests 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. The current findings support that efforts in the area of resilience training by the DOD (Reivich, et al., 2011; Seligman & Fowler, 2011) and VA rehabilitation programs (Penk, et al., 2010) to develop self-determination and self-efficacy among veterans are likely to be effective interventions to enhance risk reduction. They are also empirically consistent and conceptually resonant with extant research and scholarship advocating greater client participation in the process of violence risk assessment as a means of improving outcomes (Douglas & Skeem, 2005; Elbogen, et al., 2006; Heilbrun, 1997).

Finally, these results support that management of medical and psychiatric symptoms may be integrally related to risk reduction, especially in higher-risk veterans. Veterans with poor physical health and chronic pain are more likely to experience stress at a physiological level,

which can lead to a decreased ability to relax and increased levels of irritability, anger, and frustration. The presence of comorbid psychiatric symptoms, such as hyperarousal associated with PTSD, can also result in lack of sleep, increased aggressive impulses, and poor anger management in veterans (Elbogen, Wagner, et al., 2010; Taft et al. 2007). Thus, among higher-risk veterans, close management of comorbid medical and psychiatric symptoms could result in lower agitation and aggressiveness; likewise, physical rehabilitation resulting in improved self-care could also help reduce violence risk.

Figure 1 depicts the relationship between protective mechanisms and probability of aggression/violence for veterans who present with two or more of the risk factors examined in this study. When applied to this higher-risk group, the figure can be employed to assess a veteran's odds of future aggression and highlights the need to focus treatment on enhancing protective mechanisms. Consistent with patient-centered healthcare 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. Violence risk assessment that focuses equally on identifying protective mechanisms is likely to be perceived by the veteran as less stigmatizing than assessment that focuses only on past violence, criminal history, or other, often negatively perceived risk factors. The goal of this approach is to engage veterans more actively in assessing their own ongoing risk of violence and encourage their participation in risk-reducing interventions. Because the protective mechanisms identified in this study are easily quantifiable (e.g. work, pain, sleep), this simplifies goal setting and development of practical interventions. Of course, such an approach itself warrants empirically testing to evaluate its predictive validity and clinical utility.

The current study does not purport to have analyzed an exhaustive list of possible protective and risk variables. Within the protective mechanisms examined, there may be specific components of each variable (e.g., work) that should be investigated further (e.g., type of career, employment stability, job satisfaction). It was also not feasible to collect collateral information on violence, clinical symptoms, or history of TBI, which may have enhanced reliability of the data (Mulvey & Lidz, 1993). More research is needed to determine if rates and/or types of violence (e.g., impulsive versus instrumental) vary based on target (e.g., family versus stranger). The study of risk factors and protective mechanisms among various diagnostic subgroups would likely further inform treatment planning. For example, research should examine links between aggression and varying severities of TBI. Finally, this is the first direct prospective evaluation in an adult population of protective mechanisms following methods employed in studies of youth. There is a need to attempt to replicate the use of this model's measures and analyses in the study of protective mechanisms in both civilian and military adult populations.

Overall, current results show that socioeconomic, psychosocial, and physical health variables meet definitional criteria for protective mechanisms and were found to be associated with reduced frequency of violence and aggression, particularly among higher-risk veterans. The findings also support DOD and VA evaluation of a rehabilitation model for care to increase veteran resilience (Armstrong, 2010; Cattelani, et al., 2010; Goldberg & Resnick, 2010; LePage, et al., 2006; Manderscheid, 2007; Martz, et al., 2009; Penk, et al.,

2010; Reivich, et al., 2011; Schutt, et al., 2003; Seligman & Fowler, 2011). The study underscores the need to develop evidence-based interventions for Iraq/Afghanistan War era Veterans that bolster protective mechanisms as pathways for preventing violence post-deployment. Intervention efforts targeting multiple domains of functioning may offer hope of improvement and recovery for veterans with post-deployment adjustment problems and enhance the likelihood of successful reintegration into civilian life.

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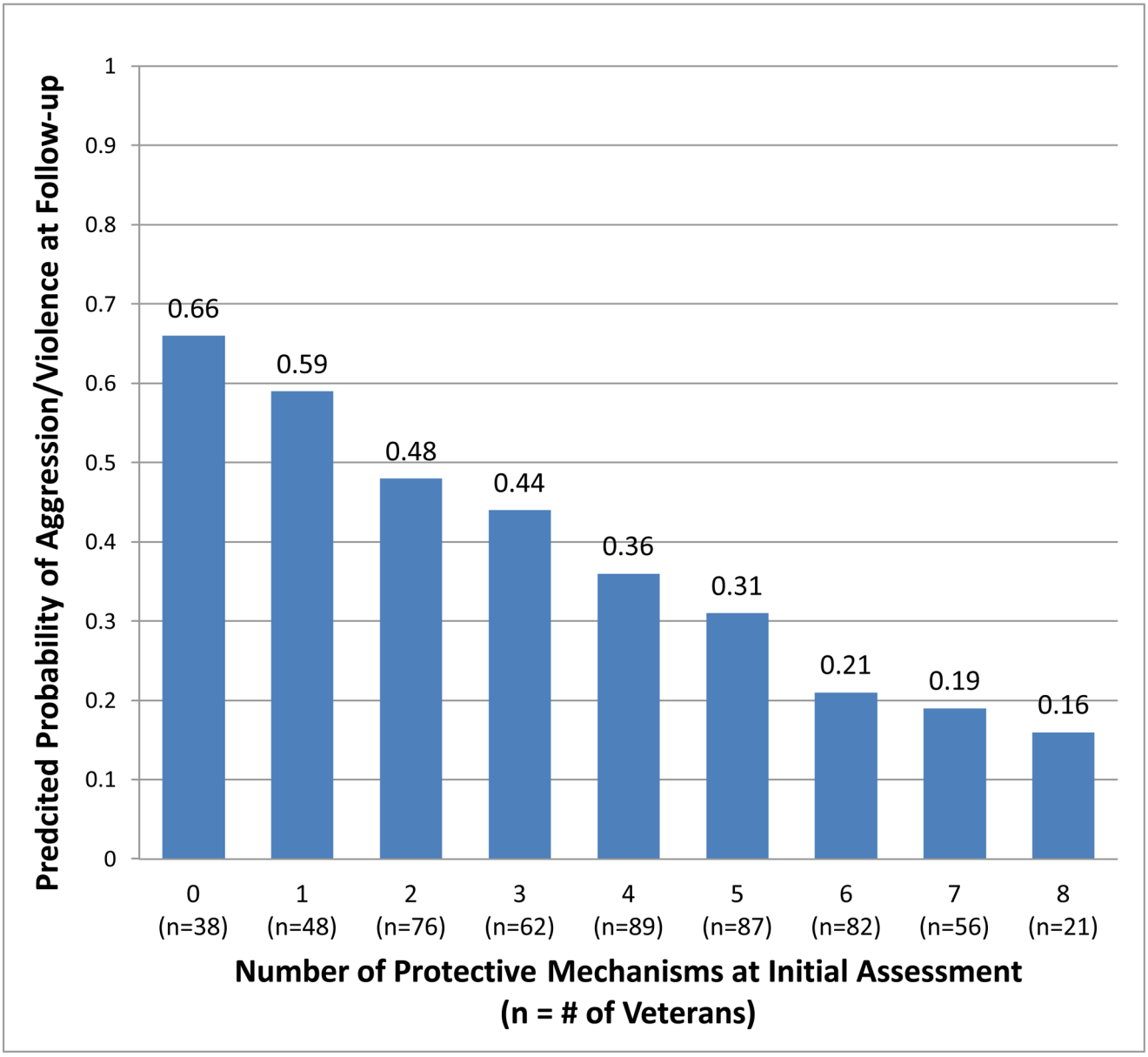

Figure 1.
Predicted probability of any aggression/violence at follow-up among veterans with multiple risk factors, as a function of cumulative protective mechanisms at initial assessment.

Table 1

Description of National Post-Deployment Adjustment Survey Longitudinal Sample by Characteristic Domains

Domain	Weighted *% (n)* or median
Demographic	
Age	34 years
Income	$50,000
Education beyond high school	82.34% (713)
Ethnicity (White, non-Hispanic)	72.65% (628)
Ethnicity (Black, non-Hispanic)	11.03% (95)
Ethnicity (Hispanic)	8.06% (70)
Married	64.2% (556)
Employed	80.89% (701)
Historical	
Parental criminal history	10.9% (120)
Witnessed parents fighting	12.11% (132)
History of previous arrests	17.66% (153)
Military	
Reserves or National Guard	48.43% (420)
Multiple deployments	26.56% (230)
Deployed over one year	25.31% (219)
Officer rank	18.5% (160)
Clinical	
Alcohol misuse	24.34% (211)
Drug misuse	6.03% (52)
Loss of consciousness with TBI	17.4% (151)
Probable PTSD	17.89% (155)
Aggression/violence	
Any aggression between initial assessment and follow-up	26.62% (231)
Minor aggression (e.g., kicking, pushing, punching)	25.89% (224)
Threat with lethal weapon (e.g., gun, knife)	3.85% (33)
Severe violent act (e.g., caused severe physical injury)	7.37% (64)

Table 2

Risk Factors at Initial Assessment and Follow-up Aggression/Violence

		Aggression/violence at follow-up			
Risk factors at initial assessment	**Weighted *n***	***n***	**%**	χ^2	***p***
Age					
Below median (less than 34)	423	139	32.82	16.24	0.0001
Median or above (34 or Older)	444	92	20.72		
Witnessed family violence					
Yes	92	38	41.71	12.00	.0005
No	774	192	24.83		
History of previous arrests					
Yes	153	63	41.42	20.83	<.0001
No	713	167	23.45		
Combat exposure					
Above median	453	156	34.52	30.26	<.0001
Below median	414	74	17.98		
Alcohol misuse					
Yes	211	87	41.14	30.06	<.0001
No	656	144	21.95		
Drug misuse					
Yes	52	24	46.65	11.42	.0007
No	814	206	25.34		
Probable PTSD					
Yes	155	76	48.71	47.15	<.0001
No	711	155	21.81		
Loss of consciousness with TBI					
Yes	151	60	39.88	16.43	<.0001
No	716	171	23.83		

Table 3

Follow-up Aggression/Violence Rate (%) and Protective Mechanisms, by Lower versus Higher Risk

	Lower level of risk (<2 risk factors; at or below median)				Higher level of risk (multiple risk factors; above median)			
	Protective mechanism at initial assessment?				Protective mechanism at initial assessment?			
Mechanism	**Present**	**Absent**	χ^2	***p***	**Present**	**Absent**	χ^2	***p***
Steady work	14.4% (n=46/322)	14.9% (n=11/74)	0.01	0.9133	32% (n=105/328)	48.2% (n=68/141)	11.42	0.0007
All needs met	12% (n=35/292)	21.7% (n=23/106)	6.01	0.0140	27.2% (n=68/250)	47.9% (n=105/219)	21.66	<.0001
Resilience	17.2% (n=23/134)	13.3% (n=35/264)	0.92	0.3373	26.7% (n=24/90)	39.3% (n=149/379)	5.4	0.0201
Perceived self-determination	14.8% (n=51/344)	11.3% (n=6/53)	0.32	0.5694	29.1% (n=89/306)	51.5% (n=84/163)	24.01	<.0001
Social support	13.8% (n=39/285)	16.5% (n=19/112)	0.49	0.4854	28.4% (n=69/243)	46.0% (n=104/226)	15.64	<.0001
Reporting no physical pain	11.5% (n=28/243)	18.7% (n=29/155)	4.02	0.0450	26.6% (n=51/192)	43.7% (n=121/277)	13.61	0.0002
Self-care	14.7% (n=57/384)	12.9% (n=4/31)	0.13	0.7183	32.4% (n=113/349)	50.0% (n=60/120)	12.85	0.0003
Healthy sleep	10.9% (n=24/218)	19.0% (n=34/179)	5.17	0.0230	27.8% (n=39/140)	40.7% (n=134/329)	7.02	0.0081

Table 4

Multivariate Models Predicting Follow-up Aggression/Violence from Risk Level and Protective Mechanisms

	β	SE	−95% CI	+95% CI	Wald χ^2	Prob > χ^2
Interaction model						
Intercept	−1.142	0.423	−1.972	−0.312	7.28	0.0070
Risk level (lower versus higher)	1.744	0.471	0.822	2.667	13.73	0.0002
Protective mechanisms (cumulative)	−0.116	0.076	−0.265	0.032	2.37	0.1237
Risk level x protective mechanisms	−0.177	0.090	−0.353	−0.002	3.92	0.0478
Stratified model: Lower level of risk						
Intercept	−1.142	0.423	−1.971	−0.312	7.27	0.0070
Protective mechanisms (cumulative)	−0.117	0.076	−0.265	0.032	2.37	0.1235
Stratified model: Higher level of risk						
Intercept	0.602	0.206	0.199	1.005	8.57	0.0034
Protective mechanisms (cumulative)	−0.294	0.048	−0.388	−0.199	37.20	<.0001