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Screening for Violence Risk in Military Veterans: Predictive Validity of a Brief Clinical Tool

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Abstract

Objective—Violence toward others is a serious problem among a subset of military veterans. This study reports on predictive validity of a brief screening tool for violence in veterans.

Methods—Data on risk factors at an initial wave and on violent behavior at 1-year follow-up were collected in two independent sampling frames: (a) a national random sample survey of 1090 Iraq and Afghanistan veterans, and (b) in-depth assessments of 197 dyads of Iraq and Afghanistan veterans and collateral informants.

Results—We chose candidate risk factors—financial instability, combat experience, alcohol misuse, history of violence and arrests, and anger associated with posttraumatic stress disorder (PTSD)—based on empirical support in published research. Tools measuring these risk factors were examined, and items with the most robust statistical association to outcomes were selected. The resultant 5-item clinical tool, the Violence Screening and Assessment of Needs (VIO-SCAN), yielded area under the curve (AUC) statistics ranging from .74 – .78 for the national survey and from .74 – .80 for the in-depth assessments, depending on level of violence analyzed using multiple logistic regression.

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Conclusions—To our knowledge, the VIO-SCAN is the first empirically-derived assessment tool for violence developed specifically for military veteran populations. As in civilians, past violence and arrest history had a robust association with future violence in veterans. Analyses show that individual factors examined in isolation (e.g., PTSD, combat experience) do not adequately convey a veteran's level of violence risk; rather, as shown by the VIO-SCAN, multiple risk factors need to be taken into account in tandem when assessing risk in veterans. Use of evidence-based methods for assessing and managing violence in veterans is discussed, addressing benefits and limits of integrating risk assessment tools into clinical practice.

Violence to others is an issue of increasing concern among military veterans (1–5). Research has examined violent behavior among veterans of Iraq and Afghanistan (2–6) and previous eras of service (7–11). To date, however, clinicians have little direction for gauging what level of risk a veteran poses in the near future (12). Admission and discharge decisions and community treatment planning would be enhanced by research that directly informs, and possibly improves, decision-making and resource allocation in these clinical contexts (13).

Evaluations grounded in a structured framework and informed by empirically supported risk factors improve the assessment of violence (14–18). In civilian populations, significant progress has been made toward identifying risk factors empirically related to violence (17, 19–21) and combining these statistically into actuarial or structured risk assessment tools such as the Classification of Violence Risk (COVR)(22) and the HCR-20(19) to aid clinicians evaluating violent behavior (20, 21, 23, 24).

No comparable research exists for military veterans. Although studies identify correlates of violence in veterans (2, 6, 11, 25, 26), to our knowledge, veteran-specific factors have yet to be combined statistically into an empirically supported, clinically useful tool for assessing violence. Neither combat exposure nor military duty necessarily renders a veteran at greater risk of violence than civilians (13); however, violence risk assessment tools incorporating potentially relevant factors unique to veterans (e.g., war zone experience, associated psychiatric disorders such as posttraumatic stress disorder) are not yet available. The current study reports on the validity of a brief screen for violence in veterans.

Method

Participants and Procedures

We employed the same measures and 1-year time frame in two sampling frames, (a) a national survey and (b) in-depth assessments of veterans and collateral informants. The national survey queried self-reported violence in a random sample of all veterans who served after September 11, 2001. The in-depth assessments probed multiple sources of violence in a self-selected regional sample of Iraq and Afghanistan veterans. Given strengths and weaknesses of each approach, we reasoned that statistical concordance of a set of risk factors for predicting subsequent violence in two disparate sampling frames would provide a viable basis for a risk screen.

National Survey—The National Post-Deployment Adjustment Survey, originally drawn by the U.S. Department of Veterans Affairs (VA) Environmental Epidemiological Service in

May 2009, consisted of a random selection from over 1,000,000 U.S. military service members who served after September 11, 2001 in Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF) and were, at the time of the survey, either separated from active duty or in the Reserves/National Guard. Veterans were surveyed using Dillman methodology (27) involving multiple, varied contacts to maximize response rates. Two waves of parallel data collection were implemented one year apart; participants were reimbursed after each wave. Risk factors at the initial wave and violence at follow-up were analyzed in the current paper.

The initial wave of the survey was conducted July 2009 to April 2010, yielding a 47% response rate and 56% cooperation rate, rates comparable to or greater than other national surveys of veterans in the U.S. (28–30) and U.K. (31). Details are found elsewhere (32) regarding sample generalizability of 1388 veterans completing the initial assessment; analysis showed little difference on available demographic, military, and clinical variables between those who took the survey after the first invitation versus after reminders, between responders versus non-responders, and between paper versus web survey completers.

One-year follow-up was conducted from July 2010 to April 2011, with 1090 veterans completing an identical follow-up survey, a 79% retention rate. Multiple regression revealed younger age and lower income predicted attrition, perhaps reflecting higher residential instability; other variables and violence were non-significant. Although estimated models accounted for 4% of attrition variance, the achieved retention rate was relatively high. To our knowledge, this national survey enrolled one of the most representative samples of U.S. OIF/OEF veterans to date.

In-Depth Assessments—The second sampling frame involved in-depth assessments of veterans and collateral informants at the Durham VA Medical Center. Participants were self-selected OIF/OEF veterans recruited through multiple approaches, including clinician referrals, advertisements, targeted mailings, and enrollment in the Veterans Affairs Mid-Atlantic Mental Illness Research, Education and Clinical Center (MIRECC) Registry Database for the Study of Post-Deployment Mental Health.

Institutional Review Board approval was obtained before data collection, which spanned June 2009 to March 2013. To be eligible for the in-depth assessments, veterans must have served in the U.S. military after September 11, 2001 (as in the national survey). Veterans selected a close family member or friend to serve as collateral informant. If both agreed to participate, data collection was scheduled at the Durham VA Medical Center. After a complete description of the study was provided, written informed consent was obtained. Assessments were conducted separately with the veteran and collateral informant and included self-report measures and face-to-face interviews.

Corresponding to the survey, the time frame for the in-depth assessments was one year, in which three waves of data collection occurred six months apart. For each wave, veterans and collateral informants provided data and were reimbursed. In the current paper, risk factors at the initial assessment and violence at follow-up assessments were analyzed using measures parallel to those in the national survey. Of the original 320 veteran-collateral dyads who

completed the initial wave, 197 pairs were retained at one year (retention rate = 62%). Attrition related to male gender and alcohol misuse, accounting for 16% of the variance.

Measures

At initial data collection in the national survey and in-depth assessments, risk factors were measured based on variables associated with violence in empirical research on veterans (12). Candidate risk factors included financial instability, combat experience, alcohol misuse, history of violence/arrests, and posttraumatic stress disorder (PTSD).

To construct a brief screen, we used single items to measure financial instability and history of violence/arrests. Combat experience, alcohol misuse, and PTSD were originally measured with scales, but in constructing a brief risk screen, we identified the single item on each scale with the strongest statistical association to violence. To do this, we entered scale items into bivariate correlation matrices, repeating this analysis for both sampling frames and at different levels of the violence outcome. From the matrices, we selected the single scale item with the strongest association.

For *financial instability*, we used an item on the Quality of Life Interview(33): “Do you generally have enough money each month to cover the following? Food, clothing, housing, medical care, traveling around the city for things like shopping, medical appointments, or visiting friends and relatives, and social activities like seeing movies or eating in restaurants?” (0= yes; 1 =no).

For *combat experience*, we examined items from the combat exposure subscale of the Deployment Risk and Resilience Inventory (DRRI) (34). Endorsing one or both of the following had the most robust relationship with outcomes: “I personally witnessed soldiers from enemy troops being seriously wounded or killed” or “I personally witnessed someone from my unit or an ally unit being seriously wounded or killed” (1=yes; 0=no).

For *alcohol misuse*, we used the item from the Alcohol Use Disorder Identification Test (AUDIT) (35) that showed the strongest correlation with outcomes: “Has a relative or friend, or a doctor or other health worker, been concerned about your drinking or suggested you cut down?” (1=yes; 0=no).

For *history of violence and arrests*, participants indicated whether they had previously been arrested or been violent toward others, excluding controlled aggressive behavior conducted during combat duties (1=yes; 0=no).

For *PTSD*, participants had to meet criteria for probable PTSD on the Davidson Trauma Scale (DTS>48) (36, 37) and report frequent anger on the following DTS item: “In the past week, how many times have you been irritable or had outbursts of anger?” (1= 4 times + probable PTSD; 0= other).

At follow-up data collection for both sampling frames, *violent behavior* was operationalized as in the MacArthur Violence Risk Assessment Study (17). *Severe violence* was coded 1 if participants endorsed specific items on the Conflict Tactics Scale (38) (i.e., “Used a knife or gun,” “Beat up the other person,” or “Threatened the other person with a knife or gun”) or

the MacArthur Community Violence Scale(39) (i.e., “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?”) in the past year. *Other physical aggression* was coded *1* if participants endorsed other items on these scales (i.e., kicking, slapping, using fists, and getting into fights) in the past year. A composite of *any violent behavior* was coded *1* if participants endorsed severe violence and/or other physical aggression in the past year.

Identical questions and coding for dependent variables were used in both sampling frames. The surveys measured violence/aggression by self-report at a 1-year follow-up, whereas assessments occurred at 6 months and 1 year and gathered information about veterans’ violence/aggression from self-report and collateral sources. Research finds considerable agreement between veteran self-report and collateral reports of violence; specifically, a study of veterans measuring violence using both self-report and collaterals revealed that 80% of cases positive for violence were determined relying on self-report only (40). This finding is consistent with civilian studies using multiple sources for measuring violence (41).

Statistical Analysis

SAS 9.3 software was used for analyses. For the national survey, women were oversampled to ensure adequate representation. Females comprised 33% of the survey sample but 15.6% of the military at the time of data collection (42); accordingly, survey data were down-weighted to reflect the prevailing military proportion, rendering a weight-adjusted $N=866$. In-depth assessments were not weight-adjusted but included collateral information on violence.

Statistical analyses were conducted in parallel for survey and assessment data. Analyses included descriptive statistics characterizing the two samples and Spearman correlations between initial-wave single-item risk factors and follow-up violent behavior (any violence, severe violence, other physical aggression) measured in the next year.

For both sampling frames, we employed multiple logistic regressions specifying five items representing risk factors as independent variables and violence outcomes as dependent variables. Scores from the single items were additively combined into a total score, which was also regressed onto violence outcomes for both sampling frames.

Regression analyses were used to derive receiver operating characteristic (ROC) curves of sensitivities versus (1 – specificities), with area under the curve (AUC) providing an index of predictive validity. Predicted probabilities of severe violence in the next year were generated based on the total risk screen score at the initial wave.

Results

Characteristics of the national survey and in-depth assessment samples are presented (Table 1). Analyses showed veterans in the in-depth assessments had higher incidence of risk factors compared to survey participants, including financial problems (41% vs.38%),

witnessing others wounded (46% vs. 40%), PTSD (29% vs. 18%), alcohol misuse (31% vs. 24%), and previous violence/arrests (47% vs. 22%).

Spearman correlations (Table 2) indicated statistically significant relationships ($p < .05$) between initial-wave risk factors (financial instability, combat experience, alcohol misuse, violence/arrests, and anger + PTSD) and violence. This pattern held for both levels of violence severity in both sampling frames, with few exceptions.

Multiple regression analyses for the survey (Table 3) revealed that risk factors had significant associations ($p < .05$) with outcome variables, suggesting each risk factor contributed unique variance. Alcohol misuse showed a trend but not a significant association with severe violence. Summed total risk scores (as used in the screening tool) had significant associations with outcomes. AUC estimates in analyses for the survey ranged from .74 to .78.

Correspondingly, multiple regression analyses for in-depth assessments (Table 4) also showed that all risk factors had significant associations ($p < .05$) with outcome variables, except combat experience and alcohol misuse with respect to other physical aggression. As in the survey, total risk scores in the in-depth assessments had significant associations with outcomes. AUC estimates in analyses for in-depth assessments ranged from .74 to .80.

Predicted probabilities of severe violence in the next year are presented as a function of risk screen score at the initial wave (Figure 1). In support of the screen's predictive validity, incidents of violence markedly increase at higher levels of predicted risk. To illustrate, in the survey, a score of "5" yielded a predicted probability of severe violence in the next year of 0.539, whereas a score of "0" yielded a predicted probability of 0.025, translating into a 95.3% ($0.539 - 0.025 / 0.539$) lower odds of severe violence between scores of "5" and "0."

Discussion

The current paper reports on the first evidence-based tool for assessing violence in military veterans, which we call the Violence Screening and Assessment of Needs (VIO-SCAN). The VIO-SCAN (Figure 2) offers potentially improved clinical decision-making and practice. First, the VIO-SCAN helps clinicians systematically gauge level of concern about veterans' risk. Second, the screen helps clinicians judge not just individual factors but a combination of factors relevant for assessing risk. Third, the tool reduces stigma by demonstrating that PTSD alone does not lead to high risk of violence in veterans; instead, to elevate risk dramatically, PTSD must combine with other risk factors. Fourth, as three of the five factors are dynamic (anger + PTSD, alcohol misuse, and meeting basic needs), the VIO-SCAN can suggest interventions to reduce violence in veterans.

As a caution, clinicians should not equate the brief assessment with a comprehensive risk assessment covering a host of other risk and protective factors. Moreover, false positives and false negatives will occur; clinicians should understand that high risk does not predict definite violence and low risk does not predict zero violence. Additionally, this screen does not replace informed clinical decision-making, which is necessary for properly interpreting results. Finally, clinicians should note that new research and scholarship indicate limits of

actuarial models for violence risk assessment (43–45) and caution about relying too heavily on results, particularly high-risk findings.

Given its time frame, the VIO-SCAN is intended to estimate longer-term risk of violence providing for an assessment of chronic, as opposed to acute, risk. If clinicians are assessing need for immediate action or psychiatric hospitalization, it is critical to continue asking about current violent or homicidal ideation, intent, or plans. In these crisis situations, the screen can certainly help evaluate how serious a threat this individual poses in general; however, if a veteran endorses current homicidal ideation and plan but scores low on the VIO-SCAN, clinicians must recognize that the screen does not evaluate imminent danger as typically defined by civil commitment statutes.

Conversely, the screen may identify veterans not currently at acute risk but showing chronic risk. According to most civil commitment statutes, such individuals would not qualify for involuntary hospitalization. Instead, clinicians should recognize that outpatient veterans may require specific risk management or safety plans to reduce risk of future violence. Research documents that social, psychological, and physical well-being is associated with significantly reduced odds of violence in veterans, including those at higher risk (6). Consequently, rehabilitation targeting these areas of functioning, as well as PTSD, anger, financial health, and alcohol misuse, may be indicated for veterans scoring high on the VIO-SCAN.

Several psychometric limitations with the research should also be mentioned. Regarding external validity, although the VIO-SCAN was not based on veterans from previous eras of service, risk factors were selected from scientific literature on such veterans (7–11). Therefore, although research is needed to replicate these findings in other veteran samples, VIO-SCAN content is derived from the broader veteran population and is arguably relevant to all veterans. Future prospective research is needed to evaluate predictive validity of this violence risk screening tool; for example, examining clinicians' use of the VIO-SCAN and determining its predictive validity in a VA or non-VA practice setting would be valuable.

Regarding internal validity, given that much of the data was gathered by self-report, underreporting is possible; however, rates of risk factors (e.g., PTSD, alcohol misuse) and violence generally comport with existing research on veterans (3, 4, 29, 46, 47). It was not possible to obtain criminal records, which might have revealed additional violence. However, studies show self and collateral reports cover most violent incidents in civilians (41), and veterans' self-reported violence is related to arrest records for violent crimes (1, 26).

To increase the likelihood of providers' exploring critical veteran-specific risk factors, more research is needed to integrate violence risk assessment with veteran treatment. One model that may be of instructive value is the Collaborative Assessment and Management of Suicidality (CAMS), useful in suicide prevention among both civilian (48) and military samples (49). In CAMS, the primary methods of treatment engagement, assessment, treatment planning, progress tracking, and outcome evaluation are all conducted using

evidence-based assessment tools that increase clinicians' likelihood of asking about important but often-missed risk factors.

Similar approaches may fruitfully apply to violence risk in veterans. Within such a framework, violence risk management would not only include ongoing, evidence-based risk assessment, but would also give veterans opportunities to learn about and assess their own triggers. The current study suggests that most effective treatments target not a single condition but a constellation of risk factors. An ideal assessment tool would provide not only a score but also a shared language with which veterans and providers can discuss triggers during treatment, as well as better engaging veterans on a path toward recovery(6).

Violence toward others has been identified as a serious problem among military veterans. This study reports on the predictive validity of a brief screening tool (VIO-SCAN) for violence in veterans that can help clinicians structure risk assessment and identify potential avenues for reducing violence. At the same time, the VIO-SCAN does not replace fully informed clinical decision-making; instead, it provides a springboard for further research investigating risk and protective factors. More comprehensive civilian risk assessment measures such as the COVR and HCR-20 may also be considered, with the caveat of currently limited validation in veterans. Lastly, it is hoped that the VIO-SCAN will provide clinicians with a systematic method for identifying veterans at high risk, as well as an opportunity to develop plans collaboratively with veterans to reduce risk and increase successful reintegration in the community.

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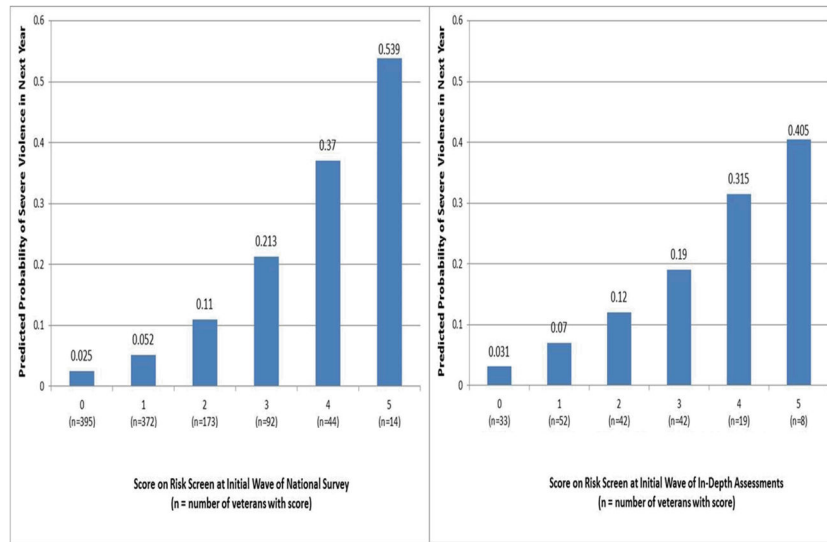


Figure 1. Predicted Probability of Severe Violence in Next Year as a Function of Total Score on VIO-SCAN at Initial Wave in Both Sampling Frames of Veterans

Domain	Item	Response	Score
Financial instability	Do you generally have enough money each month to cover the following? <ul style="list-style-type: none"> • Food • Clothing • Housing • Medical care • Traveling around the city for things like shopping, medical appointments, or visiting friends and relatives • Social activities like seeing movies or eating in restaurants 	Yes =	0
		No =	1
Combat experience	Did you personally witness someone (from your unit, an ally unit, or enemy troops) being seriously wounded or killed?	Yes =	1
		No =	0
Alcohol misuse	Has a relative or friend, or a doctor or other health worker, been concerned about your drinking [alcohol] or suggested you cut down?	Yes =	1
		No =	0
History of violence or arrests	Have you ever been violent toward others or arrested for a crime? [Excludes controlled aggression conducted while deployed in combat.]	Yes =	1
		No =	0
Probable PTSD plus anger	In the past week, how many times have you been irritable or had outbursts of anger?	≥ 4 times + probable PTSD =	1
		Other =	0
TOTAL SCORE:			

Interpreting Scores:

A. Individual items: A score of 1 should prompt detailed investigation of the risk factor and its relationship to violence. For example, if a veteran endorses history of violence, clinicians should examine type, severity, frequency, and recency of violence.

Multiple items: Combinations of endorsed risk factors should also be examined. Research has shown, for example, that co-occurring PTSD and alcohol misuse have a robust association with violence in veterans.

C. Total score: Higher total scores generally indicate a higher probability that a veteran has problems with violence. Although a veteran with a high score may be a good candidate for a comprehensive risk assessment, individual and multiple items endorsed need to be considered too. For instance, if a veteran had a total score of 1 but this was due to recent severe violence, then a full workup is warranted, even though the total score is relatively low.

Figure 2. The Violence Screening and Assessment of Needs (VIO-SCAN) ^a

^aThe VIO-SCAN is not an actuarial tool or a complete risk assessment of violence. Instead, it provides a rapid procedure for 1) prompting clinicians to consider at least five empirically supported risk factors; 2) guiding clinicians to investigate individual or combinations of risk factors in greater detail to gauge level of clinical concern; 3) identifying veterans who may be at high risk of violence; 4) prioritizing referrals for a comprehensive violence risk assessment; and 5) assessing needs and dynamic factors to develop a plan to reduce risk. The VIO-SCAN should neither be used alone nor replace fully informed clinical decision making that investigates risk and protective factors beyond the five items in the screen. The screen does not designate whether a veteran is at low, medium, or high risk. Rather, the VIO-SCAN can structure a part of the evaluation of longer-term violence risk, not imminent danger. The screen does not have perfect accuracy, so false negatives and false positives will occur. A veteran with a score of 5 may never be violent, and one with a score of 0 may be

violent. Please note that the VIO-SCAN needs to be replicated in other samples by other researchers and may be modified in the future as new research emerges.

Table 1

Description of National Survey and In-Depth Assessment Samples of Veterans

Characteristics at Initial Wave	Sampling Frame #1: National Survey		Sampling Frame #2: In-Depth Assessments	
	% or mean	N or SD	% or mean	N or SD
Age	37 years	9.5	39 years	11.4
Female gender	15.5%	134	22.7%	45
Race non-white	27.2%	236	64.7%	130
Education beyond high school	82.3%	713	72.2%	143
Army	55.2%	474	68.9%	126
Navy	14.9%	128	11.5%	21
Marines	9.6%	83	7.1%	13
Air Force	20%	171	12.0%	22
Coast Guard	0.4%	3	0.5%	1
Multiple Deployments	26.5%	230	26.2%	48
Reserves/National Guard	48.4%	420	56.3%	103
Unable to Meet All Basic Needs	37.5%	325	41.4%	82
Witnessed Others Wounded or Killed	40.0%	346	46.2%	91
Probable PTSD (DTS>48)	17.9%	155	28.7%	49
Probable PTSD + High Anger	10.3%	89	19.3%	38
Alcohol Misuse (AUDIT>7)	24.3%	211	31.4%	62
History of Violence or Arrests	22.0%	190	46.7%	92
<i>Violent Behavior in Next Year</i>				
Severe Violence	8.8%	76	14.0%	27
Other Physical Aggression	25.9%	224	47.2%	91
Any Violence or Aggression	26.3%	287	54.3%	107

Note. Figures for the National Survey are based on a weighted sample size of n=866. In-depth assessments were not weighted and had a sample size of n=197.

Table 2
Spearman Correlations between Risk Factors at Initial Wave and Violence during Next Year in Both Sampling Frames

<i>Risk Factors at Initial Wave</i>	National Survey			In-Depth Assessments		
	Any Violence or Aggression in Next Year	Severe Violence in Next Year	Other Physical Aggression in Next Year	Any Violence or Aggression in Next Year	Severe Violence in Next Year	Other Physical Aggression in Next Year
Financial Instability	0.2183 <.0001	0.1764 <.0001	0.2120 <.0001	0.2592 0.0002	0.1269 0.0755	0.2416 0.0006
Combat Experience	0.2148 <.0001	0.1608 <.0001	0.2251 <.0001	0.2774 <.0001	0.0156 0.8274	0.2456 0.0005
Alcohol Misuse	0.1945 <.0001	0.1569 <.0001	0.1964 <.0001	0.2472 0.0005	0.2116 0.0028	0.1765 0.0131
Past Violence or Arrests	0.3495 <.0001	0.2488 <.0001	0.3488 <.0001	0.4091 <.0001	0.3074 <.0001	0.3173 <.0001
PTSD + Anger	0.2493 <.0001	0.2319 <.0001	0.2866 <.0001	0.2934 <.0001	0.1793 0.0117	0.2850 <.0001

Note. Please refer to methods as well as Figure 2 for calculation of individual items for risk factor scores.

Table 3

Multiple Regression Analyses of Violence for National Survey

	Any Violence or Aggression in Next Year			Severe Violence in Next Year			Other Physical Aggression in Next Year		
	OR	CI	p	OR	CI	p	OR	CI	p
<i>Individual Risk Factors at Initial Wave</i>									
Financial Instability	1.95	1.38-2.78	0.0002	2.22	1.32-3.73	0.0027	1.90	1.33-2.71	0.0004
Combat Experience	1.92	1.37-2.69	0.0002	2.03	1.20-3.46	0.0088	2.04	1.45-2.87	<.0001
Alcohol Misuse	1.67	1.08-2.57	0.0216	1.69	0.94-3.04	0.0784	1.68	1.09-2.60	0.0198
Past Violence or Arrests	3.37	2.29-4.95	<.0001	2.70	1.54-4.72	0.0005	3.36	2.28-4.94	<.0001
PTSD + Anger	1.98	1.18-3.32	0.0095	2.20	1.19-4.07	0.0123	1.95	1.16-3.26	0.0116
	AUC=0.75, R ² =.21, $\chi^2=147.66$, <i>df</i> =5, <i>p</i> <.0001			AUC=0.78, R ² =.18, $\chi^2=77.43$, <i>df</i> =5, <i>p</i> <.0001			AUC=0.75, R ² =.21, $\chi^2=148.03$, <i>df</i> =5, <i>p</i> <.0001		
<i>Sum of Risk Items at Initial Wave</i>									
Screen Total Score	2.17	1.89-2.50	<.0001	2.18	1.82-2.61	<.0001	2.19	1.90-2.52	<.0001
	AUC=0.74, R ² =.20, $\chi^2=141.67$, <i>df</i> =1, <i>p</i> <.0001			AUC=0.77, R ² =.18, $\chi^2=76.33$, <i>df</i> =1, <i>p</i> <.0001			AUC=0.74, R ² =.21, $\chi^2=142.43$, <i>df</i> =1, <i>p</i> <.0001		

Note. Please refer to methods as well as Figure 2 for calculation of individual items for risk factor scores.

Table 4

Multiple Regression Analyses of Violence for In-Depth Assessments

	Any Violence or Aggression in Next Year			Other Physical Aggression in Next Year		
	OR	CI	p	OR	CI	p
<i>Individual Risk Factors at Initial Wave</i>						
Financial Instability	1.96	1.00–3.81	0.0492	1.94	1.02–3.69	0.0448
Combat Experience	1.97	1.01–3.86	0.0480	1.80	0.95–3.39	0.0713
Alcohol Misuse	2.58	1.07–6.21	0.0342	1.53	0.70–3.31	0.2862
Past Violence or Arrests	3.82	1.95–7.49	<.0001	2.40	1.26–4.57	0.0075
PTSD + Anger	3.11	1.13–8.55	0.0275	2.85	1.20–6.78	0.0182
	AUC=0.80 $R^2=.34, \chi^2=58.33, df=5, p<.0001$			AUC=0.75 $R^2=.24, \chi^2=39.71, df=5, p<.0001$		
<i>Sum of Risk Items at Initial Wave</i>						
Screen Total Score	2.55	1.91–3.42	<.0001	2.05	1.59–2.65	<.0001
	AUC=0.79 $R^2=.33, \chi^2=55.78, df=1, p<.0001$			AUC=0.74 $R^2=.24, \chi^2=38.31, df=1, p<.0001$		

Note: For severe violence, individual risk factor analyses could not be conducted for the in-depth assessments as for the survey because there would be five predictors and only 27 instances of severe violence; such an analysis would produce an overfit model. However, the “screen total score” variable representing the sum of risk items could be appropriately analyzed with this data and was statistically significant, yielding an AUC=.74 for predicting severe violence using items from the risk screen found in Figure 2. statistically significant, yielding an AUC=.74 for predicting severe violence using items from the risk screen found in Figure 2.