Published in final edited form as:

J Affect Disord. 2020 January 01; 260: 703–709. doi:10.1016/j.jad.2019.09.062.

Psychosocial Protective Factors and Suicidal Ideation: Results from a National Longitudinal Study of Veterans

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Abstract

Background: This study investigates the empirical association between psychosocial protective factors and subsequent suicidal ideation in veterans.

Methods: We conducted a national longitudinal survey in which participants were randomly drawn from over one million U. S. military service members who served after September 11, 2001. Data were provided by a total of 1090 veterans representative of all 50 states and all military branches in two waves of data collection one year apart (79% retention rate).

Results: In chi-square analyses, psychosocial protective factors at wave 1 (employment, meeting basic needs, self-care, living stability, social support, spirituality, resilience, and self-determination) were significantly related to lower suicidal ideation at wave 2 ($p < .01$). In multivariable analyses controlling for covariates at wave 1 including suicidal ideation, the total number of protective factors endorsed at wave 1 significantly predicted reduced odds of suicidal ideation at wave 2. In multivariable analysis examining individual risk and protective factors, again controlling for covariates, results showed that money to cover basic needs and higher psychological resilience at wave 1 were associated with significantly lower odds of suicidal ideation at wave 2.

Limitations: The study measured the link between psychosocial protective factors and suicidal ideation but not suicide attempts, which would be an important next step for this research.

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Conflict of Interest

There is no conflict of interest to report.

Conclusions: The results indicate that psychosocial rehabilitation and holistic approaches targeting these protective factors may offer a promising avenue in both veteran and non-veteran populations for treatment safety planning as well as suicide risk management and prevention.

Keywords

suicidal ideation; protective factors; veterans; psychosocial rehabilitation

Suicide is a significant problem in the United States; however, in the past decade, the suicide rate among military veterans has surpassed the demographically-matched civilian rate (Department of Veterans Affairs Office of Mental Health and Suicide Prevention, 2017; Kuehn, 2009). Research has identified many empirically derived risk factors for suicide in veterans (Friedman, 2015; Kang & Bullman, 2008; LeardMann et al., 2013; Nock et al., 2014; Ursano et al., 2018). Sociodemographic factors associated with increased suicide risk include male gender, white race, and young age (Kaplan, Huguet, McFarland, & Newsom, 2007; Schoenbaum et al., 2014;). Likewise, a robust body of research has established links between suicidality and traumatic brain injury (TBI) (Brenner, Ignacio & Blow, 2011; Oquendo, 2004) including a longitudinal study of OEF/OIF/OND veterans that found veterans who sustained a deployment-related TBI were at greater risk of attempted suicide compared to those without TBI diagnoses (Fonda, et al., 2017). Other research links suicidality and psychiatric conditions in Veterans including posttraumatic stress disorder (PTSD), depression, and alcohol use disorder (Eisen et al., 2014; Johnson, Wood, Gooding, Taylor, & Tarrier, 2011; Smith et al., 2016). One study revealed a significant relationship between PTSD symptom severity and higher suicidal ideation, plans, and impulses after controlling for demographic factors (Raines et al., 2017). In another study among treatment-seeking veterans with PTSD and at least one previous suicide attempt, depression emerged as the sole factor associated with suicidal ideation (McLean et al., 2017).

Compared to empirical studies of risk factors, there has been relatively less research identifying factors that protect against suicidality, in veterans or civilians (Franklin et al., 2017; Pietrzak et al., 2010; Wisco et al., 2014) despite its importance to recovery (Bonanno, Westphal, & Mancini, 2011). One study showed that social connectedness buffers against suicidal ideation onset and remission onset in veterans across a 2-year study period (Smith et al., 2016). Research has also revealed that veterans with a greater sense of purpose in their lives have increased psychological resilience (Isaacs et al., 2017), which in turn has shown a significant association with reduced odds of suicidality in veterans (Pietrzak et al., 2010). Finally, greater engagement in religion and spirituality has been associated with decreased risk for suicidal ideation in veterans (Currier, Drescher, Holland, Lisman, & Foy, 2016; Sharma et al., 2017).

A framework theoretically consistent with identifying protective factors for suicide in veterans and incorporating them into treatment strategies is psychosocial rehabilitation (Anthony & Liberman, 1986), which encourages clinicians to focus on an individual's competence in various domains of basic functioning (e.g., financial management, ability for self-care) and well-being (e.g., social, psychological, spiritual) (Cattalani, Zettin, & Zoccolotti, 2010; Glynn et al., 2009). The central tenets of this framework are to empower

individuals to set their own recovery goals and to actively collaborate with individuals to achieve these goals (Schutt et al., 2003; Spaulding, Sullivan, & Poland, 2003). Thus, mental health services should involve reducing symptoms as well as teaching skills to improve functioning at home, work, and social environments (Martz, Bodner, & Livneh, 2009; Penk et al., 2010).

Using psychosocial rehabilitation as a framework to conceptualize variables that potentially buffer against suicidality, this paper reports on a wide array of potential protective factors for suicidal ideation in a national sample of military veterans. In particular, for classifying psychosocial functioning, factor analyses indicate that variables generally fall into categories of *basic functioning* and *well-being* (Ro & Clark, 2009). Basic functioning encompasses an individual's living stability, self-care abilities, vocational situation, and financial status whereas well-being encompasses psychological resilience, self-determination, spirituality, and social support. Accordingly, we hypothesize that these psychosocial protective factors would predict lower odds of suicidal ideation in veterans.

Methods

Sample

The study sample was taken from two waves of data collection in the National Post-Deployment Adjustment Survey (Elbogen et al., 2013), originally drawn by the U.S. Department of Veterans Affairs Environmental Epidemiological Service in May 2009. It consists of a random selection of the over one million U.S. military service members who served after September 11, 2001, and were either separated from active duty or in the Reserves/National Guard. Female veterans were oversampled to ensure adequate representation. Following Institutional Review Board approval, veterans were surveyed using Dillman survey methodology (Dillman, Smyth, & Christian, 2009) involving multiple and varied contacts to maximize response rate.

Data collection for both waves involved parallel procedures and participants were reimbursed after each wave. The final sample approximated the actual composition of the U.S. Armed Forces (Defense Manpower Data Center, 2010) (55.21% Army, 19.92% Air Force, 14.88% Navy, 9.64% Marines, and 0.35% Coast Guard; 48% National Guard/Reserves; 27% non-white), was geographically representative of the military, corresponded to known military demographics, and represented 50 U.S. states, Washington D.C., and 4 territories in approximately the same proportion as the actual military.

Procedure

Wave 1 was conducted between July 2009 and April 2010, yielding a 47% response rate and 56% cooperation rate, comparable to other national surveys of veterans in the United States (Tanielian, 2008; Vogt et al., 2011) and the United Kingdom (Hotopf et al.; Iversen et al., 2009). Participants were initially 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 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 later, 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 the survey would close the following week.

One year later, at wave 2, participants who completed the baseline survey received the same letters, incentives, reminders, and reimbursements as in the first wave. In total, N=1090 veterans completed the one-year follow-up, yielding a 79% retention rate. Multivariate analyses revealed younger age and lower income predicted attrition, accounting for 4% of the variance, possibly reflecting that younger and less-financially able participants were relatively more transient. Regardless, analysis of attrition failed to show any substantial bias.

Measures

Suicidal ideation, was measured at waves 1 and 2 using the following item from Patient Health Questionnaire (PHQ-9) (Kroenke, Spitzer, & Janet, 2003) which asks “Over the last 2 weeks, how often have you been bothered by any of the following problems? Thoughts that you would be better off dead, or of hurting yourself in some way?” The item has been validated for measuring suicidal ideation as an outcome in veterans (Hellmuth, Stappenbeck, Hoerster, & Jakupcak, 2012; Iversen et al., 2009; Yano et al., 2012) and civilians (Gensichen, Teising, König, Gerlach, & Petersen, 2010; Goodwin, Kroenke, Hoven, & Spitzer, 2003).

Protective Factors were operationalized based on domains of *basic function* (employment, financial, self-care, and living) and *well-being* (resilience, self-determination, spiritual, and social support). Domains of basic function were operationalized as follows. *Employment* was defined as current full-time or part-time work (0=no; 1=yes). Financial status was based on responses to having enough money to *cover basic needs* including food, clothes, shelter, medical care, social activities, and transportation (0=not meeting all needs; 1=meeting all needs). *Self-care* was measured using reported degree of satisfaction with their ability to care of themselves without help (0=not satisfied; 1=satisfied) (Ferrans & Powers, 1992). *Living stability* was assessed based on reported *homelessness* within the past year (0=no; 1=yes).

Domains of well-being were operationalized as follows. *Resilience* was measured with the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003), which examines an individual’s ability to cope with stress and adapt to change (0=below median; 1=at or above median). The remaining domains were based on responses to the Quality of Life Index (Ferrans & Powers, 1992) including *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).

Covariates at wave 1 included demographic factors, specifically *age*, *race*, and *gender*. *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). *PTSD* was measured with the Davidson Trauma Scale (DTS), which rates past-week frequency and severity of DSM-IV PTSD symptoms related to a specific trauma

using a cut-off of 48 (Davidson et al., 1997). *MDD* was assessed with the Patient Health Questionnaire-2 (PHQ-2), a screening tool that includes the first two items of the PHQ-9 inquiring about the frequency of depressed mood and anhedonia over the past two weeks with a validated cutoff score of 3 showing sensitivity of 83% and specificity of 92% for MDD (Kroenke, Spitzer, & Janet, 2003). The Alcohol Use Disorder Identification Test (AUDIT) is a screen to identify *alcohol misuse* using a cut-off score of 8 (Bradley & Bush, 1998). The Drug Abuse Screening Test (DAST) (Skinner, 1982) is a screen to identify *drug misuse* using a cut-off score of 4. Using expert consensus guidelines (Ruff, Iverson, Barth, Bush, & Broshek, 2009), *TBI* was scored positive if reported loss of consciousness, post-trauma amnesia, being dazed or “seeing stars” immediately after injury or upon regaining consciousness, a skull fracture or brain surgery.

Analysis

SAS 9.4 (Cary, North Carolina) was used for all statistical analyses. Univariate analyses of sample characteristics were weighted by gender to adjust for oversampling. Women constituted 33% of the sample but represent an estimated 15.6% of the military (Defense Manpower Data Center, 2010); data in the current study were weighted to reflect the latter proportion to be representative of the military, rendering a weight-adjusted $n=866$. Chi-Square analyses were used to evaluate associations between suicidal ideation at wave 2 and each of the individual protective/risk factors at wave 1. Spearman’s correlations evaluated bivariate associations between suicidal ideation at wave 2 and variables as continuous measures at wave 1.

Multiple logistic regression analyses were conducted to evaluate the association between protective factors at wave 1 and suicidal ideation reported at wave 2, controlling for suicidal ideation at wave 1 and other covariates. The first multivariate model examined the effect of cumulative number of protective factors at wave 1. This analysis used composite variables denoting psychological distress (PTSD, MDD, or TBI) and substance misuse (alcohol misuse or drug misuse), consistent with recent research on suicidal ideation in veterans (Smith et al., 2016). In the second multivariate model, suicidal ideation was regressed on individual wave 1 protective factors and covariates; variable reduction techniques (stepwise deletion using an insertion/deletion criterion $p = 0.05$) were applied to derive a more parsimonious model and to avoid overfitting. This latter model was rerun with variables as continuous measures at wave 1. Finally, predicted probabilities of suicidal ideation at wave 2 were derived from the number of protective factors present at wave 1.

Results

Demographically, the median age of study participants was 33 years and 71% reported white race/ethnicity. Clinically, 18% of respondents met criteria for probable MDD and 18% met criteria for PTSD at wave 1. 22% screened positive for alcohol misuse and 4% screened positive for drug misuse. 21% sustained at least one TBI. With respect to the main outcome variable, 12.3% of the sample reported suicidal ideation at wave 2.

Table 1 shows bivariate relationships between individual protective factors at wave 1 and suicidal ideation at wave 2. Lower odds of suicidal ideation at wave 2 were predicted by

domains of basic function at wave 1, including: meeting basic needs ($\chi^2=42.84$, $df=1$, $p<.001$), self-care ($\chi^2=63.63$, $df=1$, $p<.001$), and full or part-time employment ($\chi^2=23.17$, $df=1$, $p<.001$) and living stability ($\chi^2=12.89$, $df=1$, $p<.001$). Additionally, reduced odds of suicidal ideation were also predicted by domains of well-being: social support ($\chi^2=23.09$, $df=1$, $p<.001$), self-determination ($\chi^2=60.74$, $df=1$, $p<.001$), spirituality ($\chi^2=5.57$, $df=1$, $p=.018$), and resilience ($\chi^2=50.80$, $df=1$, $p<.001$).

Table 2 shows bivariate relationships between covariates at wave 1 and suicidal ideation at wave 2. These were statistically significant and conformed directionally to expectations. Factors at wave 1 associated with increased odds of suicidal ideation at wave 2 included: younger age, lower income, not being married, non-white race, high combat exposure, drug misuse, PTSD, TBI, and alcohol misuse. Suicidal ideation at wave 1 had the strongest association with suicidal ideation at wave 2. With respect to continuous variables at wave 1, all showed significant correlations with suicidal ideation at wave 2: suicidal ideation at wave 1 ($r=0.44$, $p<.0001$), self-care ($r=-0.34$, $p<.0001$), self-determination ($r=-0.33$, $p<.0001$), resilience ($r=-0.32$, $p<.0001$), PTSD ($r=0.32$, $p<.0001$), basic needs met ($r=-0.28$, $p<.0001$), social support ($r=-0.27$, $p<.0001$), drug misuse ($r=0.21$, $p<.0001$), combat exposure ($r=0.19$, $p<.0001$), income ($r=-0.18$, $p<.0001$), spirituality ($r=-0.13$, $p<.0001$), and alcohol misuse ($r=0.12$, $p<.0001$).

Table 3 presents the derived multivariate models of cumulative number of protective factors (0–8) endorsed at wave 1 and suicidal ideation at wave 2, controlling for covariates. The final model ($R^2=.34$, $\chi^2=181.06$, $df=11$, $p<.0001$) was significant. Risk factors at wave 1 indicating statistically significant higher odds of suicidal ideation at wave 2 included history of suicidal ideation at (OR=7.65; 95% CI=4.21–13.91; $p<.001$), and psychological distress (OR=1.40; 95% CI=1.03–1.82; $p=.03$). Additionally, the number of protective factors at wave 1 was a significant predictor of lower odds of suicidal ideation at wave 2 (OR=0.80; 95% CI=0.69–0.92; $p=.002$) in the final multivariable model.

Table 4 displays a multiple regression analysis of individual protective factors predicting suicidal ideation with stepwise deletion. The analyses showed that wave 1 measures of combat exposure (OR=1.77, CI=1.05–2.96, $p=.03$), suicidal ideation (OR=6.77, CI=3.74–12.24, $p<.001$), MDD (OR=2.83, CI=1.62–4.94, $p<.001$), drug misuse (OR=3.29, CI=1.36–7.81, $p=.007$), basic needs met (OR=0.54, CI=0.32–0.87, $p=.02$), and resilience (OR=0.45, CI=0.26–0.80, $p=.006$) significantly predicted suicidal ideation measured at wave 2. The overall model fit was significant ($R^2=0.36$, $\chi^2=192.18$, $df=6$, $p<.0001$).

When variables were entered as continuous variables, the model yielded approximately the same results, the following being significant predictors of suicidal ideation at wave 2: suicidal ideation (OR=4.9, CI=2.65–9.06, $p<.001$), MDD (OR=1.42, CI=1.22–1.67, $p<.001$), drug misuse (OR=1.11, CI=1.01–1.23, $p=.037$), basic needs met (OR=0.86, CI=0.75–0.97, $p=.017$), and resilience (OR=0.98, CI=0.97–1.00, $p=.044$). Only combat exposure dropped out of the model. Again, the overall model fit was significant ($R^2=0.37$, $\chi^2=193.65$, $df=5$, $p<.0001$).

A plot of the association between predicted probabilities derived from the estimated model and a cumulative measure of protective factors (Figure 1). For participants with all eight protective factors at wave 1, the predicted probability of suicidal ideation at wave 2 was $p = 0.03$. In contrast, the predicted probability of suicidal ideation at wave 2 was $p = 0.60$ for participants who did not have any of the eight protective factors previously at wave 1.

Discussion

Analyzing a national longitudinal sample of veterans, we found that protective factors were associated with a statistically significant lower odds of suicidal ideation in the subsequent year, even when controlling for baseline suicidal ideation. Specifically, psychosocial protective factors endorsed (employment, meeting basic needs, self-care, living stability, social support, spirituality, resilience, and self-determination) predicted lower rates of suicidal ideation. This finding is consistent with several studies documenting protective effects of spirituality and resilience (Pietrzak et al., 2010; Wisco et al., 2014).

Further, reduction in suicidal ideation persisted in multivariate analyses even after controlling for robust risk factors. In a model controlling for demographics factors, combat history, substance abuse, psychological distress, and history of suicidality (itself a strong predictor), the count of past-year cumulative protective factors continued to be significantly associated with reduced odds of subsequent suicidal ideation one year later. For these reasons, the results demonstrate that protective factors play an important role in understanding suicide risk (Bonanno et al., 2011; Pietrzak et al., 2010; Wisco et al., 2014). In a second multivariable model specifically designed to select among individual protective factors, sufficient money for basic needs and higher scores on a resilience measure were differentially and significantly associated with lower odds of suicidal ideation.

The data suggest in addition to treating mental health and substance abuse problems, mental health services to reduce suicide risk should focus on maintaining or improving basic functioning (living, financial, vocational) and well-being (social, psychological, spiritual). Our findings argue these efforts should be expanded to incorporate and extend psychosocial rehabilitation as an important part of efforts aimed at reducing suicide risk. While therapeutic efforts, manifest through clinical service delivery, can help patients make progress in domains of basic functioning, provision of monetary or other tangible benefits can help patients improve elements of functioning more quickly. Social ecological factors such as social fragmentation and poverty (Whitley et al., 1999) as well as homelessness and other financial factors (Perkins & Hartless, 2002; Tsai & Cao, 2019) have been shown to be associated with suicidal ideation and suicidal behavior. For example, Kim and You (2019) found that adults who were late on paying their bills were significantly more than twice as likely to have a suicidal ideation compared to adults who did not have delayed payments. This research along with results in the current study suggest that addressing an individual's social context and environment is valuable to include in suicide risk assessment. As younger age was also found to be related to increased suicidal ideation in the current study, which would especially important when considered together with basic living and well-being in evaluating suicidal risk.

The data also suggest perceptions of one's own perceived control over the future as reflected in psychological resilience is positively associated with an increased capacity to cope with mental health issues. Although resilience can be understood as a single construct (Green et al., 2014), others state "it is conceptually advantageous to define resilience as a complex repertoire of behavioral tendencies." (Agaibi and Wilson, 2005). Specifically, "adaptive coping processes" or psychological mechanisms of resilience by which individuals are able to recover from traumatic events and experiences can include many dimensions including increasing tolerance of distressful emotions, building social support networks, or increasing grit and hardiness (Agaibi and Wilson, 2005; Folkman, 1997; Pietrzak et al., 2010; Yehuda et al., 2015). The current study's use of a broad measure of resilience supports future research examining which of these different facets of resilience may be important to target for suicide prevention.

The data attest to the cumulative effects of psychosocial protective factors on potentially lowering suicidal ideation (Glynn et al., 2009). In Figure 1, we see that a subset of veteran participants—those with few protective factors—appeared to be at higher risk for suicidal ideation. This means that most veterans in our sample possessed most of the selected protective factors and were at relatively lower risk of suicidal ideation. Many 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 after separating from the military. For this reason, developing protective factors in the community can be viewed as a vital part of post-deployment adjustment and psychiatric care.

Our findings also suggest a possible approach to clinical interviewing for suicide risk assessment. Questions addressing protective factors may carry less stigma at an initial interview than immediate inquiries about history of suicidal or self-harm behavior while simultaneously informing about potential risk. Organizing risk assessment interviews to ask about the presence of protective factors early in the clinical evaluation may also serve to enhance cooperation and facilitate rapport. At a minimum, such an approach to risk assessment would provide critical information about client incentive regarding follow-up and engagement in a safety planning. Consistent with patient-centered healthcare delivery principles, this process can be done collaboratively between the mental health clinician and the patient as recommended by others (Jobes et al., 2005), hopefully encouraging the latter to play a central role in determining how to approach and decrease suicide risk.

In this way, focusing on strengths of individuals may increase engagement in therapeutic processes, as some individuals find talking about risk factors to be aversive. Incorporating discussion of protective factors also reinforces a principle of rehabilitation to "move toward" positive goals and behaviors as opposed to only "moving away" from negative outcomes or behaviors (LePage et al., 2006; Martz et al., 2009; Penk et al., 2010). This draws on the science of positive psychology which shows that increasing awareness about what is positive about oneself and identifying strength of character leads to reduced depression (Folkman, 1997; Seligman, Steen, Park, and Peterson, 2005). From this perspective, focusing a risk assessment exclusively or primarily on negative risk factors could interfere with building rapport and also contribute to potential discomfort for both clinicians and clients. In this case, a client may feel less willing to open up and disclose potentially important

information, resulting in incomplete or inaccurate data about risk. Instead, building protective factors creates a more positive, hopeful, and therapeutic interaction (Jobes et al., 2005), consistent with the principles of psychosocial rehabilitation.

Study limitations should be considered. The study does not specifically measure suicidal behavior, only ideation. Although suicidal ideation has been shown to be a strong predictor of suicidal behavior (Joiner et al., 2005), the current study is limited to making interpretations about variables serving as a proxy for actual harm to self or others. Conclusions about whether the risk and protective factors relate to actual suicide attempts are thus limited. Our findings provide a potential focus for further research.

Within the examined factors, specific components of a given factor (e.g., employment) may prove more relevant to suicide risk (e.g., type of career, employment stability, job satisfaction). Also, social support only asked “emotional support get from family/friends” without considering instrumental and other types of support. Further, it is also important to note that the measures of self-determination, social support and spirituality are based on “satisfaction” with these domains, not their presence/absence; thus, one could have no social support or spirituality and be accepting of that, and score would be 1 not 0. As such, future studies should use more detailed measures of these constructs to clarify relationships with suicidal ideation. Finally, the study of risk and protective factors among various diagnostic subgroups, including those with PTSD, MDD, TBI, and other specific mental health disorders, may also further inform the suicide risk assessment process.

The current study takes a step toward uncovering and demonstrating the importance of a wider array of potential protective factors to modify and reduce risk of suicide (Franklin et al., 2017; Pietrzak et al., 2010; Wisco et al., 2014) as well as the importance of incorporating those factors into existing models for delivering mental health services including psychosocial rehabilitation. The results show the potential positive impact that an approach based on identifying and increasing personal strengths using psychosocial rehabilitation can have on suicide prevention efforts. While approaches focusing on reducing risk of suicide (e.g., treating mental health symptoms, reducing access to lethal means, safety planning.) have undeniable value, focusing on building and maintaining personal strengths helps individuals to build a life they feel is worth living. Utilization of protective factors in both risk assessment and risk mitigation efforts has the potential to better integrate suicide prevention efforts into typical day-to-day clinical work, making these efforts more seamless and concordant with the reasons individuals are likely attend appointments and take critical steps to ultimately improve the quality of their lives.

Acknowledgements.

We would like to extend our sincere thanks to the participants who volunteered for this study. 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, and the Mid-Atlantic Mental Illness Research, Education and Clinical Center.

Role of funding Source. There was no role of the funding source in preparation of this manuscript. The views expressed in this article are those of the authors and do not necessarily represent the views of the National Institutes of Health or the Department of Veterans Affairs.

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Highlights:

- Suicide is a significant problem for a subset of veterans.
- Identifying psychosocial protective factors may help these veterans.
- Meeting basic needs and resilience were related to lower suicidal ideation.
- Total number of protective factors predicted lower odds of suicidal ideation.
- Psychosocial rehabilitation may be a promising approach for suicide prevention.

Figure 1.

Predicted probability of suicidal ideation at wave 2 as a function of number of protective factors at wave 1^a

^aPsychosocial protective factors include 1) resilience, 2) meeting basic needs, 3) employed, 4) living stability, 5) social support, 6) spiritual faith, 7) ability to care for oneself, and 8) perceived self-determination.

Table 1

Association between protective factors at wave 1 and suicidal ideation at wave 2

Variable at Wave 1	Weighted N	Suicidal Ideation at Wave 2 N	Suicidal Ideation at Wave 2 %	Chi-Square	<i>p</i>
<i>Basic functioning</i>					
Employed					
yes	651	60	9.22		
no	215	47	21.65	23.17	<.0001
Basic needs met					
yes	541	36	6.65		
no	325	71	21.74	42.84	<.0001
Self-care					
yes	785	74	9.46		
no	81	32	39.97	63.36	<.0001
Homeless in past year					
no	836	97	11.55		
yes	30	10	33.33	12.89	0.0003
<i>Well-being</i>					
Spirituality					
satisfied	702	77	11.03		
not satisfied	165	29	17.74	5.57	0.0183
Resilience					
above median	456	22	4.77		
below median	410	85	20.70	50.80	<.0001
Self-determination					
satisfied	743	65	8.76		
not satisfied	124	42	33.60	60.74	<.0001
Social Support					
satisfied	528	42	8.02		
not satisfied	338	64	19.02	23.09	<.0001

Table 2

Association between covariates at wave 1 and suicidal ideation at wave 2

Variable at Wave 1	Weighted N	Suicidal Ideation at Wave 2 (n)	Suicidal Ideation at Wave 2 (%)	Chi-Square	<i>p</i>
Age					
Above median	444	48	10.88		
below median	423	58	13.81	1.72	0.1897
Gender					
female	134	18	13.13		
male	732	89	12.16	0.10	.7530
Race					
non-white	236	43	18.04		
white	630	64	10.16	9.90	.0017
Education					
High School	153	23	14.71		
Post High School	713	84	11.79	0.989	.3199
Married					
Yes	556	56	10.02		
No	310	51	16.40	7.51	.0061
Income					
<\$50K annual	372	68	18.32		
>=\$50K annual	494	38	7.77	21.86	<.0001
Combat exposure					
below median	441	31	6.95		
above median	425	76	17.87	23.91	<.0001
Drug misuse					
no	830	89	10.74		
yes	36	18	48.11	45.09	<.0001
Probable PTSD					
no	711	58	8.18		
yes	155	49	31.21	62.70	<.0001
Probable TBI					
no	672	65	9.64		
yes	195	42	21.52	19.72	<.0001
Suicidal ideation at wave 1					
no	778	54	6.96		
yes	88	53	59.49	202.66	<.0001
Alcohol misuse					
no	656	68	10.40		
yes	211	39	18.26	9.14	0.0025
Probable MDD					
no	723	47	6.47		
yes	144	60	41.72	137.90	<.0001

Table 3

Association between protective factors at wave 1 and suicidal ideation at wave 2

Variable at Wave 1	Suicidal Ideation at Wave 2		
	<i>Odds ratio</i>	<i>95% CI</i>	<i>p</i>
Suicidal Ideation at Wave 1	7.65	4.21–13.91	<.0001
Age (below medium)	0.64	0.37–1.12	0.1204
Gender (male)	0.91	0.46–1.82	0.7884
Race (white)	0.71	0.42–1.19	0.1952
Post High School	1.14	0.61–2.14	0.6872
Married	1.09	0.63–1.87	0.7612
Income (above \$50K annual)	0.62	0.35–1.10	0.1018
Combat exposure (above medium)	1.72	0.99–2.99	0.0563
Substance misuse (alcohol or drug misuse)	1.37	0.87–2.14	0.1762
Psychological distress (TBI, PTSD, or MDD)	1.37	1.03–1.82	0.0294
Protective factors (number)	0.80	0.69–0.92	0.0022

 $R^2 = 0.34$, AUC = 0.839 $\chi^2 = 181.06$, $df = 11$, $p < .0001$

Table 4

Stepwise multivariate regression predicting suicidal ideation at wave 2 based on individual protective and risk factors at wave 1

Variable at Wave 1	Suicidal Ideation at Wave 2		
	<i>Odds ratio</i>	<i>95% CI</i>	<i>p</i>
Suicidal Ideation at Wave 1	6.11	3.74–12.24	<.0001
Probable MDD	2.83	1.62–4.94	0.0003
Combat exposure	1.77	1.05–2.96	0.0312
Drug misuse	3.29	1.36–7.81	0.0069
Basic needs met	0.54	0.32–0.87	0.0162
Resilience (above median)	0.45	0.26–0.80	0.0061

$R^2 = 0.36$, AUC = 0.840

$\chi^2 = 192.18$, $df = 6$, $p < .0001$

Note. Values are presented for significant findings only.