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Psychosocial functioning deficits impact and are impacted by suicidal ideation in post-9/11 women veterans

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1. Introduction

Women veterans in the United States (U.S.) are known to be at greater risk for suicide than non-veteran women (Hoffmire et al., 2021). Suicidal ideation (SI) is an established early predictor of suicide (Klonsky et al., 2016). Yet, to our knowledge, associations between psychosocial functioning and SI, over time, have not been examined in women veterans.

Broadly, psychosocial functioning has been defined with respect to a micro-level context consisting of daily functioning such as in work and family roles as well as a macro-level context comprising the pursuit of life goals and values (Ro and Clark, 2009). The present study is focused on the micro-level context and uses a measure designed to assess micro-level psychosocial functioning in the context of trauma-related psychopathology (Bovin et al., 2018). Aspects of psychosocial functioning have been identified as gender-specific risk factors associated with suicide attempt and death. For example, among post-9/11 service members, female gender was associated with a cluster of risk factors for suicide attempt and death that included presence of a psychiatric diagnosis and prior self-directed violence with an additional risk factor for suicide death being a recent failed intimate relationship (Skopp et al., 2016). In contrast, male gender was associated with a cluster of suicide attempt and death risk factors that were of a more externalizing and antisocial nature (Skopp et al., 2016). Yet, whether psychosocial functioning such as intimate relationship functioning also affects SI in women veterans is unknown. Given that SI is upstream of suicidal behavior in

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the ideation-to-action framework (Klonsky et al., 2016), understanding associations between psychosocial functioning and SI has implications for prevention of suicidal behavior.

Although intimate relationship functioning was identified as a suicide risk factor among women service members, this and other psychosocial functioning domains may warrant attention after military service completion. Reintegrating post-9/11 women veterans are known to be more likely to report negative relationship and family experiences including divorce, relative to veteran men and non-veteran women (Adler-Baeder et al., 2006; Beder et al., 2011; U.S. Department of Veterans Affairs, 2014). Additionally, women veterans are more likely than veteran men to report being unemployed (Vogt et al., 2017). Therefore, psychosocial functioning, such as work and family functioning, are important factors to consider with respect to women veterans' mental health and within the context of their readjustment to civilian life after military service completion.

The present study extends prior research which showed that PTSD and depression symptom severity are bi-directionally related to psychosocial functioning in women veterans (Lawrence et al., 2021). Our objective in this study was to test the hypothesis that a bi-directional association would exist between SI and work, relationship, and parental domains of psychosocial functioning in women veterans, such that worsening functioning would exacerbate subsequent SI, and changes in SI would also impact subsequent psychosocial functioning.

2. Methods

This secondary data study used data from a Veterans Affairs (VA) longitudinal cohort investigation of post-military quality of life. Department of Defense records were used to identify a random sample of veterans of Operations Enduring Freedom (OEF) in Afghanistan and Iraqi Freedom (OIF) in Iraq who had completed military service within the prior two years (2008–2010). The sample was stratified by deployment component (50% Active Duty and 50% National Guard/Reserves) and gender (women oversampled at 50%). The current study focused on the subsample of 183 women veterans who responded at two timepoints, T1 (2014–2015) and T2 (2016–2017), approximately 5.5- and 7-years post-separation, respectively. Note that data were also collected approximately 2 years post-separation; however, those data did not include assessments of psychosocial functioning and thus were not used in this study. Institutional review board approval was obtained. Informed consent was inferred by return of the completed survey.

SI was measured by a single item from the Beck Depression Inventory for Primary Care (BDI-PC) (Beck et al., 1997) which states, “In the last 3 months, I have had thoughts about killing myself.” Response options for this study ranged from 1 (strongly disagree) to 5 (strongly agree). Psychosocial functioning across work, intimate relationship, and parental domains was measured with the Inventory of Psychosocial Functioning (Bovin et al., 2018). Work functioning was queried with items such as: *I got along well with others at work* and *I had trouble expressing my ideas, thoughts or feelings to others at work*. Intimate relationship functioning was assessed with items such as: *I was patient with my spouse or partner* and *I had trouble sharing thoughts or feelings with my spouse or partner*. Finally, examples

of parental functioning items were: *I had trouble communicating with my children* and *I appropriately shared thoughts or feelings with my children*. Items were scored on a 7-point Likert scale and were coded so that higher scores represent better functioning.

Change scores for SI severity and average psychosocial functioning scores were calculated as T1 minus T2. Separate fixed-effect multiple linear regressions were fit for each outcome/predictor combination to test bidirectional associations such that each predictor was also an outcome, and vice versa. Available case analyses were used for fitting each model. All models adjusted for the T1 values of the T2 outcome variable. For example, when T2 SI was the outcome variable, T1 SI was included in the model as a covariate. Sensitivity analyses additionally adjusted for age, race, and current marital status but did not significantly affect results. Descriptive analyses were performed in SPSS version 26 (IBM Corp., Armonk, N.Y., USA). All linear modeling analyses were conducted in R programming language, version 3.6.3 (R Core Team, Vienna, Austria).

3. Results

Baseline demographic, military, clinical, and psychosocial characteristics of participants are shown in Table 1. The effects of T1 to T2 changes in average level of psychosocial functioning on T2 SI severity were significant for work and relationship functioning. For every 1-unit increase in the T1-to-T2 work functioning change score (such that work functioning became more impaired from T1 to T2), SI severity at T2 increased by over a half-point (0.525), on average. Likewise, a decline in relationship functioning between T1-to-T2 was associated with a 0.277 increase in SI severity (Table 2).

A reciprocal effect of change in SI severity on downstream relationship functioning but not work or parental functioning was also observed, such that for every 1-unit increase in T1-to-T2 SI change score (such that SI severity decreased) relationship functioning improved by 0.233 points, on average (Table 2).

4. Discussion

Among women veterans, deficits in psychosocial functioning both increased SI and were exacerbated by SI, with a more consistent effect of functioning on SI than the reciprocal effect. Findings indicated a bidirectional relationship between intimate relationship functioning and SI. Considering that intimate relationship failure was identified as a risk factor for suicide among women service members (Skopp et al., 2016) and that readjustment to civilian life after military service completion may bring challenges with intimate relationship functioning, our findings suggest that support of intimate relationship functioning may be important to suicide prevention in women veterans who have recently separated from the military. Likewise, the earlier finding that women veterans, in comparison to veteran men, are more likely to report being unemployed (Vogt et al., 2017) coupled with the current finding that the strongest effect was that of work functioning on SI, suggests that support of work functioning may benefit suicide prevention efforts in women veterans who have recently separated from the military. Further, given the strongest associations were in the direction of psychosocial functioning's effect on SI,

suicide prevention efforts may benefit from assessment for SI in women veterans who present for assistance, for example in vocational rehabilitation programs or for relationship counseling.

Drawing from the interpersonal theory of suicide, the nonsignificant association between SI and parental functioning may be due to protective effects of the presence of children, which may buffer against loneliness and thwarted belongingness, factors that can lead to SI (Van Orden et al., 2010). Underscoring this possibility, a recent epidemiological study revealed that parenthood was associated with a lower suicide risk and the magnitude of effect was greater in women than men (Dehara et al., 2021).

Limitations of our study findings include the use of a single item from the BDI-PC to assess SI. However, in addition to having face validity, the item strongly correlates with the first five items of Beck's Scale for Suicidal Ideation, the gold standard for measuring SI (Desseilles et al., 2012). Another limitation may be the response scale that was used for the SI item, which denotes level of agreement, as an indicator of severity. Given that the response scale was not specific to the intensity and/or frequency of SI, implications beyond the associations between degree of SI endorsement and psychosocial functioning should not be assumed.

Further research is needed to determine the relationship between SI and psychosocial functioning during the first several years following military separation when suicide risk is highest. Future studies could also expand on this work with larger samples of men and women veterans to probe for potential gender differences as well as effects for other salient demographics, such as race and age, on associations between SI status and particular psychosocial functioning domains. Overall, our findings suggest the importance of expanding suicide prevention efforts to address women veterans' functioning in key life roles. In particular, services or treatment plans that support work and relationship functioning in women veterans and incorporate SI assessment may benefit suicide prevention efforts.

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Table 1

Baseline (T1) descriptive, clinical, and psychosocial functioning characteristics of post-9/11 women veterans.

Demographic Characteristics	% (n) / Mean (SD)
Age in years, Mean (SD)	36.03 (10.82)
Race,% (n)	
White	77.5 (141/182)
Black	14.8 (27/182)
Asian	5.5 (10/182)
American Indian or Alaskan Native	3.8 (7/182)
Pacific Islander	1.6 (3/182)
Other	2.2 (4/182)
Hispanic ethnicity	10.4 (19/182)
Education (highest level),% (n)	
High School Graduate	6.6 (12/183)
Vocational or Technical Training	2.2 (4/183)
4-Year College Degree	17.5 (32/183)
Some Graduate or Professional Education	15.3 (28/183)
Marital Status,% (n)	
Married/Living as a Couple	54.6 (100/183)
Divorced/Widowed/Separated	18.6 (34/183)
Single/Never Married	26.8 (49/183)
Parent,% (n)	78.5 (106/135)
Employment	
In Labor Force (employed + unemployed)	75.4 (138/183)
Employed	58.5 (107/183)
Military Branch,% (n)	
Marines	2.7 (5/183)
Air Force	18 (33/183)
Army	61.7 (113/183)
Navy	17.5 (32/183)
Military Job,% (n)	
Combat Arms or Support	52.5 (94/179)
Service Support	47.5 (85/179)
Clinical Characteristics	
PTSD	32.31 (15.71)
Depression	18.25 (7.94)
Alcohol Use Disorder	2.52 (2.24)
Suicidal Ideation	1.43 (0.98)
Psychosocial Functioning	
Work	128.04 (13.68)
Intimate Relationship	57.21 (13.40)
Parental	61.55 (10.21)

Note. Demographics were collected at T1 within 5-years of separation from the military (2010–2015), approximately 1.5-years prior to T2; clinical characteristics were reported at T1; ns for clinical and psychosocial characteristics ranged from 181 to 183 and 101–136, respectively; race/ethnicity categories are not mutually exclusive.

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Table 2

Effect of T1 to T2 change in psychosocial functioning on T2 SI severity and effect of T1 to T2 change in SI severity on T2 psychosocial functioning.

Psychosocial Functioning Predictor (SI Outcome)	n	B (95% CI)	p
Work *	104	.525 (0.215, 0.834)	.001
Intimate Relationship *	123	.277 (0.105, 0.449)	.002
Parental	97	.124 (-0.144, 0.391)	.361
Psychosocial Functioning Outcome (SI Predictor)	n	B (95% CI)	p
Work	103	.09 (-0.015, 0.195)	.091
Intimate Relationship *	122	.233 (0.079, 0.386)	.003
Parental	96	.046 (-0.089, 0.182)	.496

Note. * $p < .05$; B = unstandardized regression coefficient; n = sample size for unadjusted regressions. Model results are adjusted for the T1 values of the SI severity outcome variable. Sensitivity analyses that additionally adjusted for age, race, and current marital status yielded similar results.