The Association Between Reintegration, Perceptions of Health and Flourishing During Transition from Military to Civilian Life Among Veterans with Invisible Injuries

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ABSTRACT

Veterans with mental health or cognitive conditions who are separating from military service often face challenges transitioning to civilian life. However, questions remain about the relationship between reintegration and key psychosocial and well-being outcomes for veteran populations with invisible injuries soon after military separation. We investigated cross-sectional relationships between reintegration difficulties and health and well-being outcomes based on data from standardized measures with 75 US veterans. Reintegration difficulties were associated with low mental health functioning, lower social support, and lower flourishing. Reporting fewer perceived limitations with reintegration was positively associated with physical functioning, and higher levels of participation were positively associated with social support. Findings from this study suggest that among post-9/11 military veterans with mental health or cognitive conditions, fewer difficulties with reintegration are associated with greater social support, higher mental health-related quality of life, and lower levels of post-traumatic stress and somatic symptoms.

The transition from military service into civilian life represents a crucial phase for many veterans as they adjust to new healthcare needs, shift into new career paths, and integrate into their families and communities, typically referred to as a process of "reintegration" (Elnitsky et al., 2017a). Success in reintegrating into civilian contexts is considered essential to social functioning and is related to overall mental and physical health (Adler et al., 2014; Thompson et al., 2022). Although most US veterans who served after 2001 do not report substantial challenges with this reintegration process (Bonanno et al., 2012; Sayer et al., 2010), there is a subset who do, including those diagnosed with mental health disorders, such as post-traumatic stress disorder, and cognitive disorders, including traumatic brain injuries, termed "invisible injuries" (Sayer et al., 2015). In recent years, greater attention has been given to trajectories of adjustment during the early phase of adjustment from military service (Vogt et al., 2018).

Specifically, during this critical period, many veterans with invisible injuries experience difficulties with unemployment, social relationships, housing insecurity, poor physical and mental health, and decreased quality of life. Adjusting to life with an invisible injury may particularly impact veterans' overall reintegration experiences (Rattray et al., 2019; True et al., 2021). Hence, researchers have called for multi-level, longitudinal studies that account for context and attention to change over time (Elnitsky et al., 2017b). Existing studies focus on how psychiatric disorders or physical conditions affect post-deployment health (Belrose et al., 2018; McGarity et al., 2017). Additionally, recent reviews on veteran reintegration suggest that many studies tend to focus on diagnosed medical conditions among health services users with less attention given to subjective outcomes considered from the perspectives of veterans, such as quality of life, well-being, or social support (Oster et al., 2017; Romaniuk & Kidd, 2018; Sherman et al., 2015; Van Til et al., 2014). As such, there is a growing consensus on a broader conceptualization of post-military life encompassing transdiagnostic issues that also attend to these outcomes (Dichter & True, 2014; Elnitsky et al., 2017a; Kukla et al., 2015; Thompson et al., 2022).

Although researchers have used several multidimensional measures to measure veteran reintegration, readjustment, and transition, no comprehensive measure has yet to be identified (Elnistky et al., 2017a; Romaniuk & Kidd, 2018). At least three measures focus explicitly on reintegration. VHA rehabilitation researchers developed the CRIS to measure community reintegration and participation within the International Classification of Functioning framework across nine domains (L. Resnik et al., 2009; Resnik & Allen, 2007) and have used it to assess reintegration among veterans with a range of injuries (Nadkarni et al., 2022; Waid-Ebbs et al., 2018). In this paper, we use the term veteran reintegration and community reintegration interchangeably for a broader treatment of the relationship between reintegration, transition, readjustment, and integration for veterans and military service members (Elnitsky et al., 2017a).

Studies on post-military health have shifted toward assessing the quality of life and well-being (Smith et al., 2017; Vogt et al., 2021), which mirrors wider trends away from an orientation toward symptoms or specific illnesses and wellness as a state of being (Mackey, 2009). The focus on well-being shifts attention toward life satisfaction (Diener et al., 1985; Pavot et al., 1991), a cognitive assessment of overall satisfaction with one's life. In a Canadian sample of veterans, higher life satisfaction coincided with a lower prevalence of postmilitary adjustment difficulties (MacLean et al., 2014). Additionally, flourishing, or the sustained ability to grow or prosper in specific domains, indicates well-being. One validated measure, the Flourishing Index, includes cognitive and behavioral assessments across the following six domains: happiness and life satisfaction, physical and mental health, meaning and purpose, character and virtue, close social relationships, and financial and material security (VanderWeele, 2017). A study of veterans with invisible injuries found that successful reintegration coincided with individuals who had established a strong life purpose, had positive social support, and had positive experiences transitioning out of the military and interacting with civilians (Rattray et al., 2023). Flourishing and life satisfaction offer an approach for capturing veteran well-being that is disease agnostic and can be compared with other populations, such as caregivers or civilian patients (Thompson et al., 2022). To date, flourishing has not been used in studies of veteran reintegration, and it is unclear how reintegration may influence key flourishing outcomes.

In the literature on postmilitary health and well-being, reintegration difficulties have been associated with PTSD severity (Sayer et al., 2010) and TBI severity (Pugh et al., 2018), and researchers have called attention to the importance of the "polytrauma clinical triad" of PTSD, TBI, and chronic pain (Jaramillo et al., 2015; Pugh et al., 2014; Pugh et al., 2018), suggesting that studies of reintegration should control for these conditions. For example, a two-year longitudinal study of probable PTSD among recently separated veterans estimated an overall prevalence of 30% (Copeland et al., 2022). In addition, emerging evidence suggests that lower levels of social support have been associated with functional impairments related to reintegration (Bloeser et al., 2014; Vogt et al., 2021) and that social support may be a protective factor for mental

health among transitioning service members (Hourani et al., 2012), shown to aid in adjustment and can include both peer and family support (Yazicioğlu et al., 2006).

To address the gap in understanding the relationship between reintegration and mental and physical well-being, this study investigated the following question among veterans who had transitioned to civilian life with an invisible injury: How does reintegration difficulty predict flourishing, social support, and mental and physical health? It is hypothesized that fewer reintegration difficulties will be associated with higher flourishing, better mental and physical health functioning, and higher levels of social support after controlling for the effects of PTSD symptomatology and traumatic brain injury.

MATERIALS AND METHODS

The study and manuscript development was supported by a Career Development Award-2 (NAR) from the US Department of Veterans Affairs, Rehabilitation Research and Development (D2642-W). This study is a secondary analysis of baseline data for a 2-year longitudinal study that examines reintegration among military veterans with mental health or cognitive diagnoses. This data remains on Department of Veterans Affairs servers; investigators interested in working with these data are encouraged to contact the corresponding author**.** The study was approved by the Indiana University institutional review board and VA research and development committee.

DESIGN AND PARTICIPANTS

We followed the STROBE reporting guidelines (von Elm et al., 2007). Enrollment in the study required participants to (a) have completed military service after 2001, (b) be separated from service within the last 60 months, (c) have a diagnosed invisible injury, including post-traumatic stress disorder, anxiety, depression, traumatic brain injury, adjustment disorder, and (d) be over age 18. In addition, participants were excluded if they had a severe medical condition, dementia, or another severe cognitive impairment that would prevent study participation.

PROCEDURES

The study team received a list of eligible participants from a VA data manager drawn from the VA's electronic health record based on ICD-9 codes and administrative data. The team mailed letters describing the study to eligible participants. A total of 77 participants enrolled in the study, and 75 completed a baseline assessment, while two did not complete a baseline assessment and were not included in the analysis. After discussing the study aims with the participant, the interviewer obtained informed consent and HIPAA authorization, collected demographic information, conducted a semi-structured interview that lasted 60–90 minutes, and administered a set of measures examining reintegration, life satisfaction, physical health, mental health, social support, military service details, history of traumatic brain injury (TBI), current treatment for depression, and financial security. Participants received a $25 gift card for completing the assessment. We also collected data at follow-up assessments at 6, 12, 18, and 24 months for future analysis.

MEASURES

Veteran Reintegration

Two instruments were used to measure reintegration. The Military to Civilian questionnaire (M2C-Q) is a brief, self-report scale with validated internal consistency intended to measure different dimensions of community reintegration (Sayer et al., 2011). The questionnaire asks about social relations, productivity in education, work, and domestic life, community engagement and perceived meaning in life, self-care, and leisure. The questionnaire included 16 items asking the respondents to rate issues on a 5-point scale (0–4), with higher scores indicating more difficulties with reintegration. A survey of 1,291 post-9/11 veterans had a mean M2C-Q score of 1.41. The M2C-Q was specifically constructed for use with US military veterans with post-deployment reintegration difficulties over the last 30 days, in contrast to measures that explicitly measured psychological transition and cultural adjustment (Adler et al., 2011) among veterans who separated permanently from military service (Romaniuk et al., 2020).

The CRIS was developed by VHA rehabilitation researchers to measure community reintegration and participation within the ICF framework (Resnik et al., 2009; Resnik & Allen, 2007). It measures three aspects of reintegration with three subscales: extent and frequency of participation, self-perceived limitations to participation, and satisfaction with participation. The participants used the computer-adapted version of the CRIS-CAT, which has good validity (Resnik et al., 2012). In contrast to the M2C-Q, higher scores on CRIS-CAT subscales indicate higher levels of community reintegration. Field testing of the CRIS-CAT with 332 OEF/OIF veterans were Extent (M = 48.7), Limitations (M = 49.6), and Satisfaction (M = 49.6) (Resnik et al., 2012).

Health and Well-being Outcomes

The Flourishing measure includes six domains that contribute to sustained well-being (VanderWeele, 2017) and has been validated in a cross-cultural study (Węziak-Białowolska et al., 2019a). These include six domains: happiness, health (mental and physical), meaning and

purpose, character, social relationships, and financial stability, which is seen as enabling the other five domains. The Secure Flourishing Index (SFI) includes the average of all 12 items, which was used given evidence of the effect of financial stress on reintegration (Interian et al., 2014; Markowitz et al., 2022; Robertson, 2013).

The Veterans RAND Health Survey (VR-12) is a generic, self-administered instrument used to measure health-related quality of life and estimate disease burden (Kazis et al., 2006). The 12 items track eight physical and mental health domains which can be combined into two separate scores: physical component summary (PCS) and mental health summary (MCS), with higher scores reflecting better health. Following Bond et al. (Bond et al., 2022), norms developed for the original VR-12 study, which was a large, nationally representative population of civilians, which had scores of 50.1 (MCS) and 39.8 (PCS) (Selim et al., 2009). Military samples have demonstrated slightly better scores than civilians among large studies such as the Millennium Cohort Study (Smith et al., 2007).

The Patient Health Questionnaire-15 (PHQ-15) includes 15 items that assess the severity of somatic symptoms like pain, sleep issues, headaches, fatigue, and other common clinical symptoms (Kroenke et al., 2002). Since somatic symptom burden strongly influences the patient's overall perception of impairment, it relates to health-related quality of life. Total PHQ-15 scores of 5-9 are considered Mild, 10-14 considered Moderate, and 15-30 considered Severe Level of Somatic Symptom Severity. Scores above 15 have been associated with increased use of health services and greater impairment in military samples (Hoge et al., 2007).

The Multidimensional Scale of Perceived Social Support (MSPSS), a self-reported measure with 12 items, assesses perceptions of support contributed from 3 different factor groups: significant others, family, and friends (Zimet et al., 1988; Zimet et al., 1990). Responses range from "very strongly disagree" (1) to "very strongly agree" (7). The MSPSS has been used widely in clinical and non-clinical samples and has shown strong reliability and validity across different age groups. Scores of 1 to 2.9 are considered low support; 3 to 5 could be considered moderate support, and scores from 5.1 to 7 could be considered high support.

Covariates

Traumatic Brain Injury, PTSD symptoms, and time since military separation were included as possible covariates. Traumatic Brain Injury (TBI) was assessed with a ten-item questionnaire that included questions on the number of injuries, type, treatment, and severity of symptoms. The number of TBIs was indicated by: none, one, two, or three or more. In this analysis, responses were dichotomized as yes or no. The Post-traumatic Stress Disorder Checklist for the DSM-5 (PCL-5) measures PTSD symptoms and includes 20 items rated from 0 (not at all) to 4 (extremely) (Blevins et al., 2015). A likely diagnosis of PTSD was based on scores above 31 (Prins et al., 2016). The PCL-5 has good psychometric properties (Bovin et al., 2016). Military separation time was classified as 0-12 months, 13-35 months, and 36-60 months.

ANALYSES

Descriptive statistics were calculated for all measures. Relationships between CRIS-CAT and M2C-Q reintegration scales with health and well-being outcomes were explored. Outcomes included individual (psychological and physical health and flourishing) and interpersonal (social support) measures. In an initial set of models, PTSD symptoms, history of TBI, and time since military separation were tested as covariates for each outcome. Significant covariates ($p < .05$) were retained. Relationships between reintegration measures and health and well-being outcomes (PCS, MCS, MSPSS, PHQ-15, and Secure Flourishing) were estimated in separate general linear models. SAS software 9.4 was used for all analyses.

RESULTS

SAMPLE CHARACTERISTICS

The sample included 75 veterans, most of whom were male (78.7%), White (85.3%) an average age of 36.7 years (see Table 1). Of this sample, 53.3% were married or in a domestic partnership. All participants had at least one diagnosed mental health condition, and 28.0% had a history of TBI. Nearly 60% of the veterans had two or more deployments; the average length of the longest deployment was 10 months; 28.0% had a history of TBI. In terms of gender, participants identified solely as either male (78.7%) or female (21.3%).

DESCRIPTIVES

Mean scores for the M2C-Q were 1.49 (*SD* = 0.73), indicating "a little to some difficulty" on average, which suggests reintegration difficulties are slightly higher than comparable studies (Sayer et al., 2011; Sayer et al., 2015). Additionally, 75% of participants had at least a little reintegration difficulty. CRIS-CAT mean scores were 41.64 (*SD* = 7.95) for Participation; 43.71 (*SD* = 4.15) for Perceived Limitation; and 42.93 (*SD* = 4.32) for Satisfaction, each of which was lower than the original CRIS study and a study with injured veterans (Hawkins et al., 2015) but similar to a social work intervention at the VA War Related Illness and Injury Study Center (Nadkarni et al., 2022). Compared to population norms, this sample had a mean mental health MCS score of 42.1, similar to a sample of veterans who had a service-connected disability and were within 12 months

Age, Mean (Min-Max, SD)	36.65 (24–55, 8.6)
Gender male, female, n (%)	59 (78.7%), 16 (21.3%)
Race/Ethnicity, n (%)	
Black/African American	10 (13.3%)
White/Caucasian	64 (85.3%)
American Indian or Alaskan Native	1 (1.3%)
Hispanic/Latino	7 (9.3%)
Marital Status, n (%)	
Married or in a domestic partnership	40 (53.3%)
Living together	2 (2.7%)
Divorced	12 (16.0%)
Separated	5 (6.7%)
Never married	16 (21.3%)
Household Characteristics, n (%)	
Parent or legal guardian of a child 18 years old or younger	46 (61.3%)
Lives with spouse	41 (54.7%)
Lives with children	44 (58.7%)
Lives with parents	4 (5.3%)
Lives with other family members	11 (14.7%)
Lives alone	14 (18.7%)
Served in combat zone regardless of combat activity, n (%)	70 (93.3%)
Number of total deployments, n (%)	
One	28 (37.3%)
Two or Three	27 (36.0%)
Four or more	17 (22.7.3%)
Length of longest deployment in months, Mean (Range, SD)	9.72 (4-15, 3.4)
Length of service, Mean (Min-Max, SD)	13.43 (3-30, 7.83)
Length of time since separated, Mean	29.5m, 2.45y
Financial, n (%)	
Comfortable	46 (61.3%)
Just enough to make ends meet	22 (29.3%)
Not enough to make ends meet	6 (8.0%)
Prefer to not say	1 (1.3%)
Dual User	32 (42.7%)
VA service-connected disability	68 (90.7%)

Table 1 Aim 2 Participant Characteristics.

of separation (Bond et al., 2022). The PCS score was also below civilian and veteran population norms at 47.1, suggesting that this sample had poorer physical health than comparable population norms. The mean score for the PHQ-15 was 9.7, with 40.9% of participants having mild somatic symptom severity, 32.4% moderate, and 26.8% severe. These frequencies further suggest that more than half of this sample had moderate to severe somatic difficulties. The mean score for social support was 5.3 (*SD* = 1.0), in the high category based on standardized scoring (G. D. Zimet et al., 1990). The Secure Flourishing Index was (*M* = 6.37, SD=1.64), which was lower than independent studies on civilian workplace settings (Węziak-Bialowolska et al., 2019b), a five-country study (Węziak-Białowolska et al., 2019a) and among medical and psychiatry residents (Kelly-Hedrick et al., 2020).

RELATIONSHIPS BETWEEN REINTEGRATION, HEALTH, AND WELL-BEING OUTCOMES

Relationships were examined between reintegration (M2C-Q and CRIS-CAT subscales) and health and well-being outcomes and social support (see Table 2). In addition, fewer reintegration difficulties (M2C-Q) were related to higher mental health functioning (MCS), social support, and Secure Flourishing scores. M2C-Q scores were not significantly related to physical functioning (PCS) or somatic symptoms (PHQ-15). In contrast, CRIS-CAT subscales were significantly related to outcomes in only two instances. CRIS-CAT Perceived Limitation was positively related to PCS, and CRIS-CAT Participation was positively related to Secure Flourishing. No other CRIS-CAT subscale was significant in models explaining outcomes of interest.

DISCUSSION

Our study assessed the relationship between reintegration measures and interpersonal social support, physical symptoms, quality of life (physical and mental), and flourishing. Most of the study participants had poor mental and physical health compared to available published norms. However, study participants reported good social support at baseline. Fewer reintegration difficulties (M2C-Q) were strongly associated with secure flourishing, which is not unexpected given the overlapping focus on social connections and life purpose. However, secure flourishing also covers character/virtue, material stability, life satisfaction, and health, which are constructs not directly included in the M2C-Q. In understanding the range of individual and interpersonal outcomes related to the M2C-Q, after controlling for covariates, the M2C-Q significantly predicted social support and mental health-related quality of life (MCS).

VARIABLE	PHQ-15		PCS		MCS		SECURE FLOURISHING		MSPSS	
	PARM EST	STD ERR	PARM EST	STD ERR	PARM EST	STD ERR	PARM EST	STD ERR	PARM EST	STD ERR
Intercept	9.27	8.37	−17.92	21.86	63.81	21.02**	4.66	2.21*	4.90	2.20*
PCL-5	0.10	0.04**	0.34	0.10***	−0.28	0.09**	0.01	0.01	0.005	0.01
TBI (Yes)	0.61	1.03	−8.93	2.74**	5.67	2.64*	0.39	0.27	0.24	0.28
M2C-Q	1.25	0.99	−3.18	2.64	−5.55	2.54*	−1.40	0.26***	−0.69	0.27*
CRISCAT: Participation	−0.13	0.08	0.17	0.21	0.11	0.20	0.05	0.02*	−0.04	0.02
CRISCAT: Limitation	0.05	0.15	1.31	0.40**	−0.64	0.38	−0.03	0.04	0.02	0.04
CRISCAT: Satisfaction	-0.003	0.15	−0.10	0.40	0.33	0.39	0.06	0.04	0.04	0.04
R^2	0.43		0.37		0.44		0.67		0.19	

Table 2 Summary Results from General Linear Models Predicting Individual and Interpersonal Outcomes From Reintegration Measures.

Note: *p < .05, **p < .01, ***p < .001; MPSS: Multidimensional Scale of Social Support; MCS: Mental Health Component (VR-12); PCS: Physical Health Component (VR-12); PHQ-15: PHQ-15: Patient Health Questionnaire-15; PCL-5: Post-traumatic Stress Disorder Checklist for the DSM-5; n = 71 for PCL-5, PHQ515, n = 68 for VR, n = 67 for MSPSS, TBI: traumatic brain injury.

However, M2C-Q was not related to physical health-related quality of life (PCS), which is consistent with expectations as the M2C-Q does not assess physical disabilities or functioning. Whereas the M2C-Q is a relatively brief measure focused on post-deployment difficulties and general self-perception of reintegration, the CRIS-CAT has three specific subscales that focus more on behaviors, distinct limitations to participation, and specific satisfaction with defined limitations common to injured service members and veterans. The CRIS-CAT subscales were not consistently related to the health and well-being outcomes, with only two significant relationships. The hypothesis about reintegration difficulties was partially supported in that reintegration was associated with flourishing, mental health functioning, and social support after controlling for the effects of PTSD symptomatology and traumatic brain injury.

By evaluating the relationship between reintegration and health and well-being outcomes, this study extends our understanding of the transdiagnostic label of "invisible injuries," which groups mental health diagnoses with traumatic brain injuries in a way that accords with how post-9/11 veterans address difficulties from conditions associated with their military service (Spelman et al., 2012). In addition to PTSD and TBI, veterans self-report other types of invisible injuries, including chronic physical health issues. Evaluating participation, limitations, and difficulties with community reintegration with measures designed for veterans is important. Yet, these tend to emphasize deficits related to reintegration or adjustment. A broader concept that captures well-being—and includes physical and mental health, meaning, and character/virtue can complement specific reintegration scales. Measures that consider community aspects directly, such as the flourishing measure, are important. As veterans shift into civilian roles, promoting a more holistic and transdiagnostic version of health and well-being may have benefits (Romaniuk & Kidd, 2018; Thompson et al., 2022). Early evidence suggests that reintegration impacts veterans in key psychosocial domains that may not directly relate to their military service.

Compared to alternatives, the Secure Flourishing Index is notable for specific attention to factors often missing from other well-being measures: physical health, personal meaning, and material security. A broader concept of well-being may have clinical utility by addressing a sense of meaning, control, and the role of material determinants of health (VanderWeele et al., 2019). Similarly, life satisfaction is the self-assessment of overall well-being that incorporates emotional components and cognitive judgments. Study limitations should be acknowledged. The cross-sectional nature of these baseline data prevents making claims about causality. Comparable population norms were not available for all of the outcomes studied. The measures were likewise based on self-report and may not be generalizable to military samples in other regions or users of other health systems. One strength of this study is the use of two leading measures of veteran reintegration to better understand how each explains variations in associated outcomes. Although this data is cross-sectional, the results offer hypotheses that may be explored in future research. Analysis of panel data with repeated measures may offer additional insight. A self-selection bias may exist for veterans with poorer reintegration based on a need for more social support/mental health services. This could explain why the sample had overall lower scores than comparable groups. With replication, future studies may point toward the value of moving beyond treating discrete symptoms to address underlying life disruptions that affect reintegration. Addressing downstream effects may have less to do with the directionality of effects (e.g., poor social support leads to poor reintegration) than treating the overall quality of life from a psychosocial perspective.

CONCLUSION

Findings from this study suggest that among post-9/11 military veterans with invisible injuries, fewer difficulties with reintegration are associated with greater social support, higher mental health-related quality of life, and the ability to flourish. Future research and treatment of veterans experiencing difficulties with readjustment and transition from military service may benefit from carefully matching of relevant measures with the intended targets of interventions while maintaining a broad, psychosocial view of reintegration.

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COMPETING INTERESTS

The authors have no competing interests to declare.

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