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Stress, Resilience, and Reintegration Among Post-9/11 US Veterans: A Holistic Investigation

Anna G. Etchin

A dissertation submitted to the faculty at
the Bouvé College of Health Sciences, School of Nursing
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy in Nursing

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Dedication

This dissertation is a shared achievement that would not have been possible without a strong network of support from both the Etchin and Patyshman clans. They taught me that pursuing one’s goals diligently is the highest form of life, and to that I say: L’chaim! Specifically, there are several individuals to whom I’d like to give special recognition. To my brother, Ilya, for protecting me and always having faith in my abilities. To my mom, for always reminding me that my ideas are worth sharing, and my dad, for keeping me focused and pragmatic. To my uncles, aunts, and cousins: thank you for your boundless support and for always being my cheerleaders and motivators. Lastly, I wanted to recognize that we all stand on the shoulders of giants. Even though they are not all here today, my grandparents left behind legacies of intellect, diligence, and perseverance that have pushed me towards setting and achieving incrementally higher goals in life. I am beyond grateful for the love and support I’ve experienced throughout my life, from the standard-bearers that lived before me, to the family that lives nearby and internationally – you are all an inspiration and this dissertation is my gift to you.
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Abstract

Military to civilian reintegration challenges affect nearly half of United States (US) veterans returning from post-9/11 conflicts, which includes Operations Enduring Freedom, Iraqi Freedom, New Dawn (OEF, OIF, OND), and current efforts to defeat networks of violent extremists. This has become a national concern. Additionally, traumatic exposure during formative years may influence future reactions to trauma. Holistic, theory-driven perspectives are warranted to explore complex risk and protective factors as well as reintegration outcomes among post-9/11 veterans. Further, evidence-based reintegration guidelines for reintegration clinical practice are lacking. The present dissertation sought to better understand reintegration from theoretical and empirical perspectives. Findings of this dissertation are threefold: 1) theory integration procedures resulted in a System Theory of Stress, Resilience, and Reintegration, 2) recent reintegration literature was synthesized and an accompanying clinical practice guideline is presented, and 3) results of a cross-sectional study of early life trauma, deployment stress, resilience resources, and reintegration are presented.

Keywords: veteran, reintegration, resilience, theory, early life trauma
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Chapter One:
Introduction

Anna G. Etchin

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Introduction

Nearly 3 million United States (US) service members have been deployed to post-9/11 conflicts, which include Operations Enduring Freedom, Iraqi Freedom, and New Dawn (Tanielian, Batka, & Meredith, 2017). Military to civilian reintegration, the return to one’s roles in family, society, and workplace (Elnitsky, Fisher, & Blevins, 2017), is challenging for nearly half (44%) of this veteran cohort (Tanielian et al., 2017). Reintegration is inundated with psychological, physiological, and psychosocial impairments (Corby-Edwards, 2009; Currie, Day, & Kelloway, 2011; Defense and Veterans Brain Injury Center, 2014; Sayer et al., 2010; Tanielian & Jaycox, 2008). Left untreated, these potentially chronic challenges may impair health and overall wellbeing even decades later (Solomon, Shklar, Singer, & Mikulincer, 2006).


Overall, reintegration literature lacks conceptual/theoretical basis, and largely focuses on diagnostic presence or distinct domains of reintegration, such as familial (Balderrama-Durbin et al., 2015), vocational (Adler et al., 2011), social (Wingo et al., 2017), or personal (Collinge, Kahn, & Soltysik, 2012; Wilcox et al., 2015; Worthen, Moos, & Ahern, 2012). Holistic and inter-professional collaboration is warranted to promote successful reintegration (Office of the Chairman of the Joint Chiefs of Staff, 2014).

Research Aims

This research had three specific aims. The first aim was to integrate a nursing conceptual model with a psychology theory to better assess the complex nature of reintegration. The second aim was to provide a state of the science review of recent reintegration literature and to produce a clinical practice guideline. The final aim was to conduct a cross-sectional database study to explore the complex relationships of deployment combat experiences and concerns, early life trauma, resilience resources, and military to civilian reintegration among a cohort of post-deployed post-9/11 US veterans.
Manuscript Dissemination Plan

Manuscript One

This paper integrated a nursing conceptual model, Neuman's Systems Model (Neuman, 1995; Neuman & Fawcett, 2011) with a psychology theory, the Transactional Model of Stress and Coping (TMSC) (Lazarus, 1966; Lazarus & Folkman, 1987), within a metatheory of critical realism (Bhaskar, 2013). The System Theory of Stress, Resilience, and Reintegration among post-9/11 US veterans was proposed. This integrated theory was used as an organizing framework for Manuscript Two and was used for study development and interpretations of results in Manuscript Three.

Manuscript Two

The purpose of Manuscript Two was to describe reintegration, synthesize the state of the science regarding military to civilian reintegration among post-9/11 US veterans, and to provide management strategies and recommendations. The System Theory of Stress, Resilience, and Reintegration provided an organizing framework for the review of the literature and for creating the clinical practice guideline. Recent literature focused on stressor experiences and reactions to stress, resilience and resources, and perceived reintegration experiences.

Manuscript Three

The purposes of Manuscript Three were to: 1) explore the relationships among deployment stress and resilience on reintegration, and 2) evaluate the role of early life trauma on the relationship of deployment stress and reintegration among post-deployed post-9/11 US veterans. This database study used the data repository from the Translational Research Center for Traumatic Brain Injury (TBI) and Stress Disorders (TRACTS) longitudinal prospective cohort study (McGlinchey, Milberg, Fonda, & Fortier, 2017). Self-report and semi-structured clinical interview data were used for analyses. Multivariate linear regression was used to assess for associations between deployment stress (deployment concerns and combat experiences) and reintegration challenges. Causal mediation assessed the indirect effects of the following resilience resources: family and social support. A sensitivity analysis assessed the role of early life trauma on the aforementioned associations.
Contribution to Nursing Science

Nurses are well positioned to assess and care for veterans throughout reintegration and intervene to improve outcomes. Holistic collaboration is a necessary component to promote positive reintegration (Office of the Chairman of the Joint Chiefs of Staff, 2014). As reintegration is a complex phenomenon that requires consideration of multiple domains of illness and wellbeing, clinical practice guidelines are beneficial across disciplines. Further, use of theory-driven research promotes the academic discipline of nursing (Bond et al., 2011). Theory integration from distinct disciplines promotes collaboration and advances in understanding complex phenomena, such as reintegration. Knowledge gained regarding deployment combat experiences and concerns, early life trauma, resilience resources, and reintegration outcomes contribute to the growing scientific base that may be used to develop effective practice guidelines. Ultimately, knowledge gained may help many more veterans to experience successful reintegration.
References


Washington, DC.


Wingo, A. P., Briscione, M., Norrholm, S. D., Jovanovic, T., McCullough, S. A., Skelton, K., & Bradley, B. (2017). Psychological resilience is associated with more intact social functioning in veterans with

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Chapter Two: Manuscript 1
Toward a System Theory of Stress, Resilience, and Reintegration

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Abstract

Military to civilian reintegration is a complex, multi-dimensional phenomenon. As such, holistic perspectives are warranted to study reintegration and related concepts. Despite the need for theory-driven research, recent nursing reports lack a theoretical component. Complex phenomena require theory to understand and interpret relationships. This report integrated a nursing conceptual model, Neuman’s Systems Model (NSM), with a psychology theory, the Transactional Model of Stress and Coping (TMSC).

A Conceptual-Theoretical-Empirical model was created using integrated concepts from NSM and the TMSC. Exemplar measurement instruments and their conceptual foci are presented. Further, an adapted System Theory of Stress, Resilience, and Reintegration is provided with an application to research demonstrating its utility.

*Keywords:* veterans, nursing theory, nursing research, theory integration
Toward a System Theory of Stress, Resilience, and Reintegration

Military to civilian reintegration captures the return to one’s family, community, and workplace roles following military exit (Elnitsky, Fisher, & Blevins, 2017). Challenges with successful reintegration affect a significant percentage (44%) of post-9/11 United States (US) service members as they reintegrate back into civilian society (Tanielian, Batka, & Meredith, 2017). Challenging reintegration has been linked to psychological, physical, and social morbidities (Berg, 2011; Bosco, Murphy, Peters, & Clark, 2015; Corby-Edwards, 2009; Falvo et al., 2012; Hoge et al., 2004; Owens et al., 2008). Further, 25-56% report “some” to “extreme” difficulty with social functioning, productivity, community engagement, and self-care (Sayer et al., 2010). These problems have implications for greater society as economic, human, productivity, and healthcare costs during and throughout reintegration are considerable in this cohort (Blakeley & Jansen, 2013; Institute of Medicine, 2014; National Coalition for Homeless Veterans, 2015; U.S. Department of Veterans Affairs, 2016; Zogas, 2017).

The RAND corporation, an American nonprofit institution focusing on improving policy and decision making, suggested holistic investigation to examine the complexities of military to civilian reintegration from a comprehensive perspective (Sims, Vaughan, Theologis, Boal, & Osilla, 2015). The US Department of Defense Centers of Excellence similarly recommended holistic application toward reintegration programs, specifying the Total Force Fitness model (Yosick et al., 2012). The model integrates a mind-body holistic perspective, though lacks interacting external and environmental factors. The Military Family Fitness Model expands upon the Total Force Fitness model and aims to improve family ‘fitness’ and resilience over time (Bowles et al., 2015). The model captures external variables, but lacks individual stressor demands (justly, as it is meant for families). The RAND corporation has suggested a holistic model specific to US Air Force wounded warriors that incorporates services, health, housing instability, social functioning, and job/finance (Sims et al., 2015). Although lacking individual core characteristics that may also influence reintegration, the model encompasses mutually reciprocating concepts specific to reintegration. The World Health Organization (2001) recommends use of the International Classification of Functioning, Disability, and Health (ICF) as a holistic framework, though this framework is not specific to service members or veterans. The ICF surpasses the aforementioned framework limitations and encompasses personal and contextual factors that influence functioning and
disability. The framework spans various disciplines, making it an appealing option for holistic investigations. The principal outcomes, however, are narrow: body functionality and disability. The aforementioned frameworks all have value for holistic investigation, but consistently lack systematic and comprehensive inclusion of key factors that may influence reintegration. More importantly, they lack a holistic outcome.

The following content attempts to fill this gap. This paper presents an integration of a nursing conceptual model, Neuman’s Systems Model (NSM), with a psychology theory, Transactional Model of Stress and Coping (TMSC), within a metatheory of critical realism, resulting in a System Theory of Stress, Resilience, and Reintegration among post-9/11 US veterans. An overview of critical realism, NSM, and the TMSC are presented, followed by the proposed integrated theory with an application to research.

**Background**

Nursing transitioned from a vocational/professional to an academic discipline in the 1950s, with emphasis placed on developing independent theory-driven evidence (Bond et al., 2011). Knowledge generated from research is rooted in scientific theory, which functions to contextualize new knowledge within a useful framework (Butts, 2011). Theories can guide research to improve nursing care practices to positively influence the health and quality of life for persons, families, and communities (McEwen & Wills, 2014). Yet, trends between 1985 and 2010 demonstrate decreases in theory-based nursing research (Yarcheski, Mahon, & Yarcheski, 2012), reversing the trends of last century.

Research can be guided by various levels of theory. For instance, metatheories influence interpretations of research findings, particularly concepts of truth and reality (Alvesson & Sköldberg, 2009). Yet, nursing metatheory is lacking in nursing research literature (Van Sell, 2017). Theoretical frameworks, guided by conceptual models are directly testable (Fawcett & Desanto-Madeya, 2012; Im, 2005) and more commonly used in research. A conceptual model provides a guiding framework to comprehensively organize and establish relationships among given concepts (Fawcett, 2013; Fawcett & Desanto-Madeya, 2012; Fawcett & Gigliotti, 2001). Integration, using a Conceptual-Theoretical-Empirical (C-T-E) system, is useful in systematically evaluating and synthesizing a phenomenon (Fawcett, 2013; Fawcett & Desanto-Madeya, 2012).
Further, although theory integration across disciplines is controversial (Bond et al., 2011; Fawcett, 1999), interdisciplinary healthcare systems and teams are bound to benefit from collaboration, especially for complex phenomena, such as military to civilian reintegration. More so, theory integration from distinct disciplines may further advance understanding of complex phenomena. A White Paper from the Office of the Chairman of the Joint Chiefs of Staff (2014) advocates for holistic collaboration as a necessary component for promoting successful reintegration. As distinct healthcare disciplines bring forth unique expertise, collaboration among them may promote novel insights and interventions.

**Conceptual and Theoretical Frameworks**

**Metatheory: Critical Realism**

Critical realism suggests that distinct aspects of the whole act differently than when placed together and viewed as a whole (Clark, Lissel, & Davis, 2008), and recognizes the independent contributions of characteristics within a phenomenon to be interrelated within nature and science (Bhaskar, 2009). From this perspective, phenomena are made up of observable effects and their subsequent outcomes (Bhaskar, 2013). Therefore, reality is made up of actual events and actions, underlying motifs, and observable perceptions and experiences (Bhaskar, 2013). Applied to the current context, the reality of deployment and reintegration includes veterans’ experiences, actions, and perceptions.

**Conceptual Model: Neuman’s Systems Model**

In 1970, Betty Neuman developed the Neuman’s Systems Model (NSM; see Figure 1, Table 1) to assist nursing students to recognize the holistic complexity of patient care (Fawcett & Desanto-Madeya, 2012). The application of NSM in research enables predicted efficacy of preventive efforts on retention, attainment, and maintenance of system stability (Neuman & Fawcett, 2011), as demonstrated by a client’s health, or optimal level of wellness at a given time (Fawcett & Gigliotti, 2001; Neuman, 1995). Ultimately, NSM seeks to explain how system stability is maintained in response to stressors from the environment. Philosophical underpinnings of NSM embrace a holistic, multidimensional, and dynamic perspective of relationships among variables within a reciprocal interaction world view (Fawcett & Desanto-Madeya, 2012).
Holism describes the integration of system elements that are interconnected and function together to achieve an outcome. A system is the dynamic, synergistic composite of factors that are not simple reducible to their parts (Alimohammadi, Taleghani, Mohammadi, & Akbarian, 2014). As such, complex phenomena, such as military to civilian reintegration, cannot be studied in silos or using different components (Meadows & Wright, 2008; Neuman & Fawcett, 2011). The holistic underpinnings of NSM make it a suitable conceptual framework for studying the complex nature of reintegration, though only one known published study has utilized NSM in military-related research (McRae-Bergeron et al., 1999).

**Client system and interacting variables.** Within NSM, a client is the center of a system of mutually-related variables influenced by a client's internal and external features and stressors (Neuman, 1990, 2005; Neuman & Fawcett, 2011). The basic components of the client include survival and individual factors such as genetics, weaknesses, and/or strengths (Fawcett & Gigliotti, 2001; Neuman, 1995). Interacting variables (physiological, psychological, sociocultural, developmental, and spiritual) regarding the client should be considered concurrently; they lead to varying degrees of protection or invasion from stressors within the system (Fawcett & Desanto-Madeya, 2012). Health and/or illness is determined by these interacting factors.

**Environment.** The environment is fundamental within NSM, encompassing all internal and external forces that affect the client. It includes the internal (where intra-personal stressors exist), external (where inter-personal and extra-personal stressors exist), and the created environment (Fawcett & Gigliotti, 2001; Neuman, 1995). The created environment reflects the dynamic, unconscious, and protective mechanism to maintain system stability (Neuman & Fawcett, 2011).

**Stressors.** Stressors occur within the individual and his or her system (intra-personal), between or among individuals (inter-personal), or outside of the individual (extra-personal) (Fawcett & Desanto-Madeya, 2012). Harmful and neutral effects of stressors are intuitive; however, positive effects include increased resistance against future stressors as well as successful return to and maintenance of one’s optimal level of overall wellness stability.

**Reconstitution and lines of defense and resistance.** Reconstitution, a process and/or outcome (Gigliotti, 2012), is the adjustment and return to system steady state following stressor reaction (Fawcett & Desanto-Madeya, 2012). The concept is minimally described or researched (Gigliotti, 2012; Neuman &
Fawcett, 2011) and is often only discussed with regards to the lines of resistance and defense, which are made up of the five interacting variables (physiological, psychological, sociocultural, developmental, and spiritual) (Fawcett & Desanto-Madeya, 2012).

The highly dynamic flexible line of defense moderates the reaction to environmental stressors in an attempt to prevent or minimize system reaction (Gigliotti, 1997). It plays a protective role as a buffer against stressors that impact a person’s usual level of wellness, or the normal line of defense (Fawcett & Desanto-Madeya, 2012; Gigliotti, 1997). When the buffer is weak or ineffective against stressor invasion, the client’s normal wellness level reacts (Fawcett & Gigliotti, 2001; Neuman, 1995) and the lines of resistance are activated.

Lines of resistance are stable, internal and external factors that protect the client’s core and mediate reconstitution to the client’s normal wellness state following stressor invasion (Gigliotti, 1997, 2012). Lines of resistance are fundamental to the makeup of the client, and thus not easily modified. However, they can be acquired or learned, such as an immune response or well-established health behaviors (Gigliotti, 1997).

**Theoretical Framework: The Transactional Model of Stress and Coping (TMSC)**

Lazarus and Folkman’s Transactional Model of Stress and Coping (TMSC; Figure 2, Table 2) (Lazarus, 1966; Lazarus & Folkman, 1987) contributed to the development and maturation of NSM. Lazarus and Folkman sought to better understand stress and coping in adults and to explain the environmental and internal stressors that influence individuals’ wellbeing. Similar to NSM underpinnings, the TMSC encompasses the person and environment within a mutually reciprocal, dynamic relationship (Lazarus & Folkman, 1984). From the transactional model perspective, an individual is the composite of themselves and their environment (Lazarus & Folkman, 1984). One cannot be investigated without consideration of the other, allowing for intra-and inter-individual comparisons (Lazarus & Folkman, 1984).

**Stress and appraisal.** Stress is a stimulus or a response and is considered within the relationship of person and environment (Lazarus & Folkman, 1984). It is dependent on the dynamic perception and appraisal of the meaning of the stress stimuli. Individuals react uniquely to stressors, based on stressor characteristics and one’s coping ability and stressor perception. Stressful events occur in relation to context with other events and within the life cycle (Lazarus & Folkman, 1984). Cognitive
perception and appraisal are dependent upon the relationship between person and environment (Lazarus, 1966; Lazarus & DeLongis, 1983). Stressors, created by the internal and external environment, disrupt balance and affect one’s wellbeing. With ineffective coping, stressors may lead to illness. Primary and secondary appraisal and coping are mediating processes (Lazarus & Folkman, 1984). As such, researchers cannot predict performance and outcomes just by knowing the stressors (Lazarus & Folkman, 1984).

Primary appraisal is one’s distinct initial perception of the significance of a stressor on one’s wellbeing: benign, harmful, positive, negative, controllable, etc. (Glanz, Rimer, & Viswanath, 2008; Lazarus & Folkman, 1984). Secondary appraisal is the action arm, including evaluation of stressor controllability and one’s perceived coping resources and abilities that manage the reaction. Interpretations and reactions to comparable experiences are individualistic and related to individual coping mechanisms. Past experiences shape future appraisals and aid in development of coping skills for future similar encounters (Lazarus & Folkman, 1984).

Appraisal is based on individual characteristics: commitment and beliefs (Lazarus & Folkman, 1984). Commitments are individual meanings one makes of events as harmful or beneficial. Beliefs are individual or group perceptual lenses and shape one’s understanding of the meaning of an event. Of note, past experiences of harmful events, whether it be direct or indirect connections and experiences, shape future appraisals of similar experiences (Lazarus & Folkman, 1984). These past experiences, whether harmful, beneficial, or neutral, aid in development of coping skills necessary for future encounters (Lazarus & Folkman, 1984). Thus, predictability becomes an important concept in determining future reactions.

Duration of a stressful event may wear down one’s psychological and physiological wellbeing (Lazarus & Folkman, 1984). Further, stressful events occur in relation to the individual’s life, both in context with other events and within the life cycle (Lazarus & Folkman, 1984). Notably, timing of the event in relation to other events becomes crucial in understanding stressor reaction.

Coping. Coping, directed at secondary appraisal, is the actual cognitive and behavioral/emotional mechanism(s) and action(s), along with available psychological, social, and cultural resources (Glanz et al., 2008), that mediate appraisal and result in stress reduction (Lazarus & Folkman, 1984, 1987). Coping
includes problem management and emotional regulation. Problem-focused coping strategies are more effective for dynamic stressors while emotion-focused strategies work best for static stressors (Glanz et al., 2008). Of note, situations and stressors can be dynamic, thus coping efforts may also change based on time and context (Glanz et al., 2008; Lazarus & Folkman, 1984). Meaning-based coping efforts can prompt positive emotion, such as spirituality, positive re-interpretation of event, etc. (Glanz et al., 2008). Positive affect may function as a protective buffer against negative stress reactions (Folkman & Moskowitz, 2000). Coping resources can involve tools, problem-solving and social skills, social support, health, energy, positive beliefs, finances/material resources, or the ability to find necessary resources, which can be beneficial and/or harmful (Lazarus & Folkman, 1984). The lifespan trajectory of coping is controversial as efforts may be static or dynamic based on contextual factors and past experiences (Glanz et al., 2008; Lazarus & Folkman, 1984). Coping may be equated with adaptation, though the relationship between the two may be more circular than hierarchical (Lazarus & Folkman, 1984).

**Adaptation.** Positive or negative adaptation, or the outcome of coping mechanisms and efforts, includes three main, potentially interacting, outcomes: emotional wellbeing (including life satisfaction, morale), functional status (including health status, disease progression, vocational/social living), and somatic health (Glanz et al., 2008; Lazarus & Folkman, 1984). Short and long-term adaptation is considered within the context of the environment and situation.

Within a critical realism metatheory, the integration of NSM and the TMSC provides a theory that is testable, explicit, and adds hypothesized relationships missing from each. The following proposed integrated theory provides a comprehensive framework focusing on complex issues that post-9/11 US veterans face during/throughout military to civilian reintegration.

**System Theory of Stress, Resilience, and Reintegration**

**Application to Research**

In keeping with systems logic, integration of NSM and the TMSC is appropriate to study the multifaceted, interdependent, and often concurrent nature of deployment-related stressors, resilience, and reintegration. Reality should be considered from a critical realism perspective: events and personal perceptions/experiences are considered together within a reciprocal system of the person, environment, and context.
A Conceptual-Theoretical-Empirical (C-T-E) model was created (Figure 3) using integrated concepts from NSM and the TMSC. Exemplar empirical tools, along with their measured concepts can be found in Table 3. The C-T-E model is relevant for hypothesis testing but lacks deeper theoretical relationships. Thus, the integrated System Theory of Stress, Resilience, and Reintegration (see Figure 4) is necessary for hypothesizing and testing relationships, as well as interpreting findings. Key components of the theory are described next.

This integrated theory captures a system of synergistic relationships of concepts within a perspective of the environment/context (i.e. in relation to time in one’s life or other events) and person (i.e. demographic characteristics, beliefs/morals/values, prior experiences). This is similar to NSM, but with the addition of contextual perspectives and past experiences. Within the theory, stress encompasses the actual event, past stress, and reactions to stress. Resilience captures perceptions of the stress (i.e. is the stress harmful or benign?) and one’s ability to take action on it (i.e. is the stress manageable?), as well as one’s resources to cope with the stress (i.e. social support, skills). Reintegration is the ongoing process or outcome following stress and resilience and is associated with resuming one’s roles as a civilian.

Reintegration. Neuman’s concept of system stability in reconstitution can be perceived as reintegration, which is also congruent with Lazarus and Folkman’s concept of adaptation. Of note, the known literature often utilizes reintegration, resilience, adaptation, and coping synonymously as actions and/or outcomes. However, as previously discussed, these concepts are theoretically distinct.

Factors that influence successful reintegration are multifaceted. These may be intra-personal, such as mental health problems. Inter-personal factors may include military unit structure or family and other social supports. Resource availability or environmental factors represent extra-personal influences. Despite the complex nature, most studies focus on domains of reintegration, such as family (Balderrama-Durbin et al., 2015), occupational (Adler et al., 2011; Amick et al., 2017), or personal functioning (Ettenhofer, Melrose, Delawalla, Castellon, & Okonek, 2012). Domain-specific investigations limit the multi-dimensional knowledge of reintegration. From the NSM perspective of holism, the whole (i.e. reintegration) is made up of its parts (i.e. various domains) that cannot be easily reduced.
**Resilience.** Integrating Lazarus and Folkman’s concept of coping and NSM’s concepts of the lines of resistance and flexible lines of defense, resilience can function as a dynamic buffer that mediates reactions to stressors (Earvolino-Ramirez, 2007; Fleming & Ledogar, 2008; Neuman, 1990; Tusaie & Dyer, 2004). Resilience includes the beliefs, actions, and abilities that promote coping (Brenner et al., 2015) or adaptation to challenging conditions (Earvolino-Ramirez, 2007; Yosick et al., 2012). It can be innate, learned (Bonanno, 2005), or acquired (Richardson, 2002). As a protective and adaptive resistance against stressors, resilience may mediate reintegration success following deployment-related stressors (Earvolino-Ramirez, 2007; Fleming & Ledogar, 2008; Neuman, 1990; Tusaie & Dyer, 2004), though the exact mechanisms are poorly understood.

Notably, resilience includes resources which strengthen one’s ability to reintegrate successfully. Common resources in the literature include social support (i.e. friends, society, family) (Fischer et al., 2015; Hinojosa & Hinojosa, 2011; Kukla, Rattray, & Salyers, 2015), relational support (i.e. significant others) (Larson & Norman, 2014; Melvin, Wenzel, & Jennings, 2015), and personal characteristics (i.e. self-esteem, the ability to make meaning of experiences) (Brenner et al., 2015; Kukla et al., 2015). Research suggests that coping is integral for and during reintegration (Elnitsky et al., 2017); thus, it should stand that resilience is a vital component for positive reintegration outcomes.

**Stress.** The construct of stress gained recognition in nursing research in the 1970s, though had been long before been identified by other disciplines, like psychology (Lyon, 2000). Lazarus & Folkman (1984) define stress from a psychological perspective as a stimulus or a response made by the environment that can affect one’s wellbeing. From a nursing perspective, intra-, inter-, and extra-personal stressors are reaction-causing stimuli that can be positive, negative, or neutral (Fawcett & Desanto-Madeya, 2012; Neuman, 1990; Neuman & Fawcett, 2011).

Reintegration outcomes may be influenced by various stressors, which should be viewed holistically. For instance, a recent study by Jennings, Melvin, & Belew (2017) found that combat experiences were not enough to explain deployment characteristics. Instead, a compilation of deployment and personal demands, along with personal and inter-personal resources, could be stressful and/or supportive. Lifetime personal demands have also been investigated, revealing important avenues for research and interventions. Research suggests that early life stress can predict aspects of adult
psychopathology (Carr, Martins, Stingel, Lemgruber, & Juruena, 2013), resilience (Wright, Masten, & Narayan, 2013), and coping strategies (Lazarus & Folkman, 1984). In the presence of chronic stress, positive and/or negative emotion-based coping may occur (Folkman & Moskowitz, 2000), thus, the study of resilience in the face of stress is appropriate.

**Discussion and Conclusions**

Veterans reintegrating back into civilian society are faced with numerous, complex interdependent risk factors and needs. A holistic, systems-based framework, such as the integrated System Theory of Stress, Resilience, and Reintegration, generates more effective and comprehensive strategies for treatment, along with wellness promotion and management. Promoting positive reactions (i.e. personal growth, coping skills) to chronic stress may reduce the severity of or prevent chronic stress disorders (Folkman & Moskowitz, 2000).

Integrated concepts and relationships from NSM and the TMSC have the potential to provide a holistic point of reference for examining various stressors, resilience, and reintegration among veterans. Philosophical congruency between critical realism, NSM, and the TMSC further suggest that theoretical integration is appropriate for research. Further, integrative collaboration and comprehensive investigation is needed to better comprehend trajectories of these concepts (Wright et al., 2013).

With regard to critical realism, investigation includes participant experiences (including their perceptions of experiences), underlying motifs that lead to the actual events, and the methods used to measure these aspects of reality. As critical realism postulates, humans are a composition of their parts (Bhaskar, 2008). To best understand successful reintegration, scientists should investigate the construct within a holistic framework.

Methodological challenges should be considered for research. Since coping is a dynamic process with complex mechanisms, operationalization requires a multidimensional approach (Lazarus & Folkman, 1984). Another option is to investigate multiple stressful situations and coping patterns in the same person to attempt to understand one’s coping style. Some coping strategies may be consistent over time, but past experiences may play a crucial role in future responses. Investigation of lifetime stress and coping mechanisms may provide better insights regarding coping and adaptation trajectories. Notably, coping and adaptation may be a tautology that can create a confounding event when attempting to
investigate separately; thus, they should be conceptualized clearly. Another challenge to consider is that affect and coping have a reciprocal relationship, thus the causation pathway is directly based upon the research question (Folkman & Moskowitz, 2000). Future research should further investigate, through qualitative methods, individual coping experiences and characteristics as well as how persons maintain positive affect despite chronic and/or severe stressful experiences.
<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>A client (individual, family, community, social issue) is the center of a system of symbiotic variables influenced by the client’s internal and external characteristics and stressors (Neuman, 1990, 2005). The basic structure of the client is composed of survival and individual factors (Fawcett &amp; Gigliotti, 2001; Neuman, 1995).</td>
</tr>
<tr>
<td>Interacting Variables</td>
<td>Physiological, psychological, sociocultural, developmental, and spiritual interacting variables that lead to varying degrees of protection or invasion from environmental stressors within the client system (Fawcett &amp; Desanto-Madeya, 2012).</td>
</tr>
<tr>
<td>Health</td>
<td>System stability is demonstrated by health, or a client’s optimal level of wellness at a given time (Fawcett &amp; Gigliotti, 2001; Neuman, 1995).</td>
</tr>
<tr>
<td>Stressor</td>
<td>Inert, reaction-causing stimuli that can be harmful and/or helpful (Fawcett &amp; Desanto-Madeya, 2012; Haggart, 1993; Neuman, 1990). Intra-personal stressors occur within the veteran and his or her system, inter-personal stressors occur between or among individuals, and extra-personal stressors occur outside of the individual (Fawcett &amp; Desanto-Madeya, 2012).</td>
</tr>
<tr>
<td>Environment</td>
<td>The environment encompasses all internal and external forces that affect the client. This includes the internal (where intra-personal stressors exist), external (where inter-personal and extra-personal stressors exist), and the created environment (the unconsciously created open system) (Fawcett &amp; Gigliotti, 2001; Neuman, 1995).</td>
</tr>
<tr>
<td>Reconstitution Flexible line of defense</td>
<td>The return to steady state (Fawcett &amp; Desanto-Madeya, 2012). The highly dynamic flexible line of defense moderates the reaction, or effect, of environmental stressors on the client in attempt to prevent or minimize system reaction (Gigliotti, 1997).</td>
</tr>
<tr>
<td>Normal line of defense Lines of resistance</td>
<td>The client’s normal wellness level (Fawcett &amp; Gigliotti, 2001; Neuman, 1995). Stable, internal and external factors that protect the client’s core and mediate reconstitution to the client’s normal wellness state following stressor invasion (Gigliotti, 1997, 2012).</td>
</tr>
<tr>
<td>Interventions</td>
<td>Primary intervention is aimed at protection of the normal line of defense. Secondary prevention is directed at protecting the client’s basic structure by means of strengthening the lines of resistance. Tertiary prevention is reconstitution and wellness maintenance following treatment of a stressor (Fawcett &amp; Gigliotti, 2001; Neuman, 1995).</td>
</tr>
<tr>
<td>Concept</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Primary appraisal of stress</td>
<td>Evaluation of the significance of a stressor or threatening event.</td>
</tr>
<tr>
<td>Secondary appraisal of stress</td>
<td>Evaluation of the controllability of the stressor and a person’s coping resources.</td>
</tr>
<tr>
<td>Coping efforts</td>
<td>Actual strategies used to mediate primary and secondary appraisals.</td>
</tr>
<tr>
<td>Outcomes of coping</td>
<td>Emotional well-being, functional status, health behaviors.</td>
</tr>
<tr>
<td>(adaptation)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Exemplars of Instrument Tools and Associated Theory/Model Concepts

<table>
<thead>
<tr>
<th>Concept measured</th>
<th>Instrument tool</th>
<th>Theory concept (conceptual model concept)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reintegration Challenges</strong></td>
<td><strong>Military to Civilian Reintegration Questionnaire (Sayer et al., 2011)</strong></td>
<td>Adaptation (reconstitution)</td>
</tr>
<tr>
<td><strong>Life Satisfaction</strong></td>
<td><strong>Satisfaction with Life Scale (Diener, Emmons, Larsen, &amp; Griffin, 1985)</strong></td>
<td>Adaptation (reconstitution)</td>
</tr>
<tr>
<td><strong>Functionality and disability</strong></td>
<td><strong>World Health Organization Disability Assessment-II (Üstün et al., 2010)</strong></td>
<td>Adaptation (reconstitution)</td>
</tr>
<tr>
<td><strong>Deployment combat experiences</strong></td>
<td><strong>Deployment Risk and Resilience Inventory-2: Deployment Combat Experiences (DRRI-2)</strong> (Vogt et al., 2013; Vogt, Proctor, King, King, &amp; Vasterling, 2008; Vogt, Smith, King, &amp; King, 2012)</td>
<td>Primary &amp; secondary appraisal of stress (stressor)</td>
</tr>
<tr>
<td><strong>Deployment concerns</strong></td>
<td><strong>DRRI-2: Deployment Concerns</strong></td>
<td>Primary &amp; secondary appraisal of stress (stressor)</td>
</tr>
<tr>
<td><strong>Family resilience</strong></td>
<td><strong>DRRI-2: Post-deployment Family Experiences</strong></td>
<td>Coping resources (lines of resistance)</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td><strong>DRRI-2: Post-deployment Support</strong></td>
<td>Coping resources (lines of resistance)</td>
</tr>
<tr>
<td><strong>Early life trauma</strong></td>
<td><strong>Traumatic Life Events Questionnaire (Kubany et al., 2000)</strong></td>
<td>Primary or secondary appraisal of stress (stressor)</td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td><strong>Pain, post-traumatic stress disorder, mood/anxiety/substance use disorders</strong></td>
<td>Health</td>
</tr>
<tr>
<td><strong>Demographics</strong></td>
<td><strong>Age, gender, ethnicity, education, etc.</strong></td>
<td>Core structure</td>
</tr>
<tr>
<td><strong>Background data</strong></td>
<td><strong>Marital status, living situation, socioeconomic status, etc.</strong></td>
<td>Interacting variables</td>
</tr>
</tbody>
</table>

Note: these concepts are considered within the context of the person and environment.
Figure 1. Neuman Systems Model

Figure 2. The Transactional Model of Stress and Coping

Figure 3. Conceptual-Theoretical-Empirical (C-T-E) Model
Figure 4. System Theory of Stress, Resilience, and Reintegration
References

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Chapter Three: Manuscript 2

Military to Civilian Reintegration Among Post-9/11 US Veterans: A State of the Science Review

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Abstract

Veteran survival rates in post-9/11 conflicts are the highest recorded in United States (US) war history. Yet, physiological, psychological, and psychosocial impairments stand to impact veteran reintegration, which is the process and outcome of returning to one’s role in their family, community, and workplace. Economic and human costs are substantial in this cohort. The purpose of this state of the science review was to: 1) describe post-9/11 veteran reintegration, 2) synthesize recent literature, and 3) provide management strategies and recommendations. Clinical practice guidelines are useful for implementing evidence-based care and treatments. Guidelines explicitly delineate a problem, provide an algorithm of care and treatment options, and deliver recommendations based on the strength of the literature. Yet, no guidelines exist for veteran reintegration. This report proposes a reintegration guideline based on the literature. Prevention, screening, and interventions are provided within an algorithm to ensure comprehensiveness.

*Keywords:* veteran, military, reintegration, adaptation, guideline
Military to Civilian Reintegration Among Post-9/11 US Veterans: A State of the Science Review

Background

Veteran survival rates in post-9/11 conflicts, which include Operations Enduring Freedom, Iraqi Freedom, and New Dawn (OEF/OIF/OND), are the highest recorded in United States (US) war history. Yet, physiological, psychological, and psychosocial impairments stand to impact veteran reintegration (Beder, Coe, & Sommer, 2011; Sammons & Batten, 2008; Tanielian & Jaycox, 2008), which is the process and outcome of returning to one’s role in their family, community, and workplace (Elnitsky, Fisher, & Blevins, 2017). Nearly half (44%) of post-9/11 US veterans experience reintegration challenges (Tanielian, Batka, & Meredith, 2017). These challenges are a national concern as over 4 million service members and veterans are serving or have served in these conflicts (Committee to Evaluate the Department of Veterans Affairs Mental Health Services, Board on Health Care Services, Health and Medicine Division, & National Academies of Sciences, Engineering, and Medicine, 2018).

Apart from the cost of these conflicts, which is estimated to be greater than $7 billion dollars (Department of Defense, 2017), healthcare costs associated with poor reintegration outcomes were nearly $1 billion in FY2012 (Blakeley & Jansen, 2013). A recent study, part of the Costs of War project at Brown University, reported that since 2002, the Department of Veterans Affairs (VA) spending on veteran educational and vocational rehabilitation benefits were over $90 billion since 2002 (Zogas, 2017). Human costs are equally as, if not more, important to consider. Suicide rates among post-9/11 veterans are 21% higher than their civilian counterparts (Logan, Bohnert, Spies, & Jannausch, 2016; U.S. Department of Veterans Affairs, 2016). As of 2011, nearly 1 million service members were diagnosed with at least one psychological disorder (Institute of Medicine, 2014). Post 9/11 veterans have unprecedented rates of posttraumatic stress disorder (PTSD), depression, and traumatic brain injury (TBI) (O’Neil et al., 2013; Tanielian & Jaycox, 2008; Thomas et al., 2010). Homelessness is more prevalent among the general veteran population compared to civilians (Fargo et al., 2012) and post-9/11 veterans accounted for 10% of the overall homeless population in 2010 (National Coalition for Homeless Veterans, 2015). Of 20.9 million US veterans (9% of the adult civilian population), 18% are from the post-9/11 era and over 5% of those are unemployed (U.S. Bureau of Labor Statistics, 2017). Both economic and human costs are substantial in this cohort.
Evidence-based clinical practice guidelines aim to improve veteran care and outcomes. The VA has guidelines for various aspects of veteran needs, such as mental, physical, rehabilitative, and women’s health (VA Evidence Based Clinical Practice Guidelines, 2017). A post-deployment Health Evaluation and Management Guideline, seemingly similar to reintegration concerns, was replaced with the Management of Chronic Multisymptom Illness guideline (Department of Veterans Affairs & Department of Defense, 2014). The utility of this guideline is appropriately broad, though its focus on clinical symptomatology hinders utility for overall veteran reintegration. Despite the known sequelae associated with challenging reintegration, no guideline or protocol currently exists.

The purpose of this state of the science review was to: 1) describe veteran reintegration, 2) synthesize recent literature, and 3) provide management strategies and recommendations.

Review of the Literature

Veteran reintegration literature has markedly increased in the past five years, though notably, most of the studies employed qualitative methodologies or a cross-sectional design without a comparison group. A systematic search of published literature, between the years 2012-January 2018, identified peer-reviewed research reports focused on post-9/11 US veteran reintegration. Electronic databases, including Medical Literature On-Line (MEDLINE), Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsychINFO, and PubMed were searched. The search was finalized on 1/18/18. Various combinations of free text and Medical Subject Heading (MeSH) terms or keywords, with a truncation symbol (“*”) were used to identify relevant reports. Variations of the following keywords included: veteran, reintegration, coping, and adaptation. The search was limited to reports published in English and relating to post-9/11 US veterans. Only primary source, peer-reviewed, research-based reports were reviewed. To capture a holistic understanding, no limitations were set for methodological approaches. As this is not a systematic review, other key articles were included based on importance of information; not all eligible articles were included in this paper. The matrix method, proposed by Garrard (2017), was used to organize and synthesize studies. NVivo 11 for Mac (QSR International Pty Ltd., 2017) was used for data synthesis.

As reintegration is inherently complex, the System Theory of Stress, Resilience, and Reintegration (see Chapter 2, Figure 4) was used as an organizing framework for this literature review.
and the proposed clinical practice guideline. The theory is the integration of a nursing conceptual model, Neuman’s Systems Model (Neuman, 1995) with a psychology theory, the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984). The main concepts that served as the organizing framework for this literature review are: stressors and stressor reactions, resilience and resources, and perceived reintegration experiences.

**Stressor Experiences and Reactions**

**Deployment and combat.** Post-9/11 conflicts vary from prior wars. National Guard and reservists were heavily depended on, enlistment was entirely voluntary, deployments were longer and more frequent, time between deployments was shorter, and injuries sustained were far different. These deployment characteristics prompted complex reintegration challenges (Baiocchi, 2013; Institute of Medicine & National Academies Press, 2010). Approximately 25-56% of combat-veterans who sought care at the VA reported “some” to “extreme” reintegration difficulty, specifically with social functioning, productivity, community engagement, and self-care (Sayer et al., 2010).

Combat exposure has been associated with family (Balderrama-Durbin et al., 2015), vocational/financial (Elbogen, Johnson, Wagner, Newton, & Beckham, 2012; Kukla, Rattray, & Salyers, 2015), and personal dysfunction (Currier, Lisman, Irene Harris, Tait, & Erbes, 2013; Daggett, Bakas, Buelow, Habermann, & Murray, 2013). Beder, Coe, & Sommer (2011) assessed all three areas of dysfunction and reported significant associations with combat exposure, as well as deployments lasting longer than 24 months, multiple deployments, and being wounded.

However, among a sample of post-deployment National Guard members with low combat exposure, Wilcox et al. (2015) identified mental health symptoms, vocational difficulties, family dysfunction, alcohol misuse, and relational impairments. In particular, the authors found that rates of these challenges remained constant for up to six months post-deployment. Notably, this longitudinal study was descriptive in nature. One qualitative study (Lusk et al., 2015) identified potential positive outcomes related to combat-related physical pain: higher pain tolerance, self-confidence, and resilience throughout reintegration; though most of the experiences described are negative.

**Diagnostic and symptom sequelae.** Symptom sequelae of common combat-related injuries (PTSD, depression, mild TBI [mTBI]) include many overlapping psychological, physiological, cognitive,
social, and functional impairments (Tanielian & Jaycox, 2008) that may further exacerbate reintegration challenges (Corby-Edwards, 2009; Currie, Day, & Kelloway, 2011; Defense and Veterans Brain Injury Center, 2014; Sayer et al., 2010). Specifically, depression, PTSD, generalized anxiety disorder, and panic disorder were associated with impaired occupational functioning among a large sample (n=797) of veterans (Adler et al., 2011). Further, in a retrospective study of 48,821 veterans, co-morbid mTBI, PTSD, and major depressive disorder were associated with a significant risk of unemployment (Amick et al., 2017). Elbogen et al. (2012) found that veterans (n=1,388) with these three diagnoses were at risk for financial difficulties. Similarly, among veterans with mTBI, McGarity et al. (2017) identified compilations of these predictors and associations with the inability to drive a vehicle independently (worse PTSD symptoms and depression), employability (worse depression), and community participation (worse PTSD and cognitive functioning).

Additionally, alcohol and other substance misuse during and/or post-deployment has been associated with various reintegration challenges, such as unlawful behaviors (Larson & Norman, 2014) and occupational dysfunction (Kukla, Rattray, & Salyers, 2015). Suicidal ideation secondary to illicit substance use has been linked to social functioning impairments, such as difficulties with maintaining military friendships, getting along with family, perceiving to belong in civilian society, and finding meaning and purpose in life (Haller, Angkaw, Hendricks, & Norman, 2016). Additionally, prescription opioid misuse among veterans with TBI and depression, was related to various aspects of reintegration, particularly vocational and housing instability, and family/relational functioning (Golub & Bennett, 2013).

Non-diagnostic stress. Appreciably high incidences of functional impairments, irrespective of diagnostic presence, affect this veteran cohort (Beder et al., 2011; Sammons & Batten, 2008; Tanielian & Jaycox, 2008). Some studies identified stress with everyday civilian tasks (a component of reintegration), such as driving, to be associated with limited participation in society (Hwang, Peyton, Kim, Nakama-Sato, & Noble, 2014; Mattocks et al., 2012). However, Hwang and colleagues did not explore potential confounding diagnoses or symptoms. On the other hand, Mattocks et al. reported that some of the women who reported difficulties with everyday tasks were receiving PTSD treatment. Due to the qualitative nature of the study, empirical validation was not an option. Additional stressors associated with negative reintegration, specifically occupational/financial functioning include not resuming a pre-
deployment job (Griffith, 2015), poor health, and combat exposure (Kukla et al., 2015) have been correlated with financial strain, including lower income and poor finance management.

**Pre-military stress.** Risk factors for negative reintegration may overlap from pre- to post-military. Youssef et al. (2013) identified childhood trauma as a significant risk factor and resilience a protective factor for adulthood mental health impairments, specifically depression and/or suicidal ideation. However, they did not investigate the trajectory of resilience from childhood to adulthood, nor the association between childhood trauma and reintegration challenges. Research suggests early life trauma is a predictor of adult psychopathology (Carr, Martins, Stingel, Lemgruber, & Juruena, 2013). Yet, this literature base is minimal in relation to veteran reintegration.

**Resilience, Resources, and Risk and Protective Factors**

The US Department of Defense (DoD) promotes investigation and understanding of resilience as an important objective to enhance reintegration (Meredith, Sherbourne, & Gaillot, 2011). As such, there is an increasingly large evidence base of resilience literature.

Military-specific resilience factors exhibiting protective influence have been investigated. For instance, unit cohesion and various resources (social, financial, and educational) have been positively associated with resilience (Institute of Medicine, 2012; Tanielian & Jaycox, 2008). Similarly, a report on active military personnel identified various resilience factors: intra-personal (i.e. positive affect, positive thinking), behaviors (i.e. positive coping, behavioral control, adaptability), and inter-personal (i.e. communication, support, teamwork, unit cohesion, belongingness, connectedness) (Meredith et al., 2011).

Positive reintegration has been associated with positive personal characteristics, such as self-confidence, self-esteem, coping, and making meaning of experiences (Brenner et al., 2015; Kukla et al., 2015). A qualitative study with 47 veterans found that family involvement facilitated social functioning during reintegration (Fischer et al., 2015). Similar findings were noted from the qualitative component of a mixed-methods study (Kukla, Rattray, & Salyers, 2015). Family and social support protected veterans against poor health and enhanced community reintegration outcomes. Further, being married (Larson & Norman, 2014) and rekindling marriages (Melvin, Wenzel, & Jennings, 2015) were found to be protective during reintegration. Additionally, maintaining trust and intimacy within military friendships supported
positive family reintegration (Hinojosa & Hinojosa, 2011). Having relevant available information and skills, along with social and familial support facilitated social functioning during reintegration (Fischer et al., 2015; Kukla et al., 2015). Understandably, poor social support and lack of available or accessible resources has been associated with challenging reintegration (Hawkins, McGuire, Britt, & Linder, 2015).

Among a sample of 800 veterans, various demographic predictors were associated with domains of reintegration. For instance, Asian or Hispanic descent were associated with positive family functioning, female gender and ages 21-25 with negative work functioning, and ages 40-50 with negative personal, family, and work functioning (Beder et al., 2011). Conversely, another study failed to identify significant correlations with these demographic variables and community reintegration when family and individual health factors were entered into a regression model (Moriarty et al., 2015). In fact, the authors identified depression as the only significant independent predictor of community reintegration when holding the demographic variables constant.

**Perceived Reintegration Experiences**

Much of the literature on reintegration perceptions uses qualitative methodologies. As such, rich discoveries of the veteran experience are uncovered. Reintegration was often seen as a time of disorientation for veterans straining to identify between their military and civilian identities (Koenig, Maguen, Monroy, Mayott, & Seal, 2014; Mankowski, Tower, Brandt, & Mattocks, 2015; Wands, 2013). For example, veterans who felt “single” or fully independent while deployed often experienced challenges with reintegrating back to married life (Brenner et al., 2015). Similarly, a grounded theory study among nine soldiers with mTBI, Hyatt, Davis, & Barroso (2015) identified a common theme of finding a “new normal” in the contexts of relationships, homecoming, health/functionality, personality/behaviors, and daily routines. Through content analysis of semi-structured interviews with 42 female National Guard members, Kelly, Berkel, & Nilsson (2014) identified similar findings. Participants described difficulties with returning to pre-military roles and duties, such as planning, managing family activities, reconnecting with a spouse, and caring for a child. Re-defining one’s military identity into a civilian role was often directed at perceived meaningfulness of one’s job or purpose. Nevertheless, some participants in the study reported positive reintegration experiences following deployment, such as greater appreciation for life.

A qualitative study using focus groups found that veterans felt displaced, both in time and in their
life roles, upon return to civilian life after the military (Demers, 2011). Cultural differences between their military and civilian worlds further overwhelmed them. A related study found that among female OIF veterans, negative reintegration was exemplified by unsuccessful coping with deployment experiences and renegotiating their identities (Demers, 2013). Renegotiating and redefining roles was a similar finding from in-depth interviews with veterans diagnosed with PTSD or TBI (Freytes, LeLaurin, Zickmund, Resende, & Uphold, 2017). Cultural adaptation and time dysfunction also was found in a study of student veterans (Wands, 2013). The author found that the context of time played an important role as a predictor of negative reintegration; for instance, veterans described feeling as though they had to make up for lost time and that home life continued on without them making it difficult to catch up.

Management Strategies

Military to civilian reintegration is complex and multi-faceted. As such, management strategies should be comprehensive. Just over 40% of post-9/11 US veterans are in need of mental health services, yet only about 22% perceived a need for care (Committee to Evaluate the Department of Veterans Affairs Mental Health Services et al., 2018). However, veterans without psychological disorders may also benefit from strategies to improve reintegration outcomes.

Clinical Recommendations

Primary prevention aims to strengthen one’s defenses against stressors (Neuman & Fawcett, 2011). Veterans and their family members/support systems may benefit from having available and accessible resources (Hawkins et al., 2015; Institute of Medicine, 2012; Tanielian & Jaycox, 2008). These may include available programs, financial support, education, support systems, etc.

Early identification and treatment (i.e. secondary prevention; Neuman & Fawcett, 2011) of reintegration problems is warranted to reduce symptomatology and severity. A handful of psychometrically validated reintegration instruments have been developed to measure holistic or specific domains of reintegration. An overview of validated reintegration measures can be found in an article by (Elnitsky, Fisher, & Blevins, 2017).

Tertiary prevention includes mechanisms to maintain wellbeing and reintegrate successfully (Neuman & Fawcett, 2011). Numerous reintegration programs exist to provide education, offer adaptive support, and maintain health and wellness. The VA recommends a non-diagnostic focus on reintegration
treatment and management, such as education, skills training (i.e. coping), cognitive restructuring, and family counseling (Ruzek et al., 2004).

A number of known reintegration interventions/programs exist specifically designed for post-9/11 US veterans. The majority of the peer-reviewed evidence base is in the pilot stage; thus, efficacy data are limited. Still, the interventions show promise. As these programs continue to evolve, assessment and evaluation of efficacy data will be crucial in further developing clinical practice guidelines. Yosick and colleagues (2012) provide a brief summary of reintegration programs, though many new interventions have surfaced since 2012. Select programs/interventions with peer-reviewed results in the last several years are briefly presented in Table 1.
Table 1. Select Reintegration Intervention Evidence Base for Post-9/11 US Veterans

<table>
<thead>
<tr>
<th>Reintegration intervention or program</th>
<th>Focus</th>
<th>Brief description</th>
<th>Evidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veterans Conservation Corps (VCC; Bellotti et al., 2011)</td>
<td>Social functioning, daily tasks</td>
<td>10-month educational and vocational program</td>
<td>Pilot data</td>
</tr>
<tr>
<td>Life Guard (Blevins, Roca, &amp; Spencer, 2011)</td>
<td>Social reintegration</td>
<td>Promotes resilience and reintegration</td>
<td>Pilot data</td>
</tr>
<tr>
<td>Self-Directed Program of Integrative Therapies (Collinge, Kahn, &amp; Soltysik, 2012)</td>
<td>Relational functioning</td>
<td>Multi-media package of guided therapies for relationship partners</td>
<td>Pilot data</td>
</tr>
<tr>
<td>Operation Restoration (Davis et al., 2012)</td>
<td>Relational functioning</td>
<td>Retreat for intimate partners</td>
<td>Pilot data</td>
</tr>
<tr>
<td>Online Expressive Writing (Sayer et al., 2015)</td>
<td>Social support</td>
<td>Expressive writing about thoughts and feelings</td>
<td>Efficacy</td>
</tr>
<tr>
<td>Veterans’ In-home Programme (VIP; Winter et al., 2016)</td>
<td>Community Reintegration</td>
<td>For veterans with TBI</td>
<td>RCT</td>
</tr>
<tr>
<td>STEP-Home (Fortier et al., 2017)</td>
<td>Overall reintegration</td>
<td>Reintegration skills building</td>
<td>Feasibility</td>
</tr>
</tbody>
</table>

Note: RCT = randomized controlled trial

Recommendations

With 250,000 post-9/11 service members exiting the military annually (Office of the Chairman of the Joint Chiefs of Staff, 2014), facilitating successful reintegration to their home and communities, and in major social life roles is a VA priority (Resnik et al., 2012). The VA provides integral care for veterans across all ages and conditions, though their size limits them from providing care to all veterans. As such, most veterans seek care outside of the VA (Sayer, Carlson, & Frazier, 2014). A reintegration guideline is warranted for providers who care for veterans reintegrating to civilian life, yet none currently exists. Figure 1 presents the Clinical Practice Guideline for Post-9/11 US Veteran Reintegration. Primary, secondary, and tertiary prevention efforts are integrated into the guideline.

Following military exit, the veteran should be assessed for their risk level for reintegration challenges. This provides a baseline assessment to based future assessments on. Notably, providers should provide appropriate resources, such as available reintegration programs, for all veterans, even those deemed at low risk. Among those at medium or high risk, the guideline encourages shared decision-making, which can improve engagement, for determining the treatment plan and goals. Building and strengthening resilience and supporting positive reintegration through effective interventions can
further improve reintegration outcomes. Lastly, re-assessment is needed for all veterans since reintegration is not bound by specific time frames, also since challenges may occur later for some.

Summary

Although this state of the science review was not exhaustive of the recent post-9/11 US veteran reintegration literature, this report provides an integrated synthesis and management strategies and recommendations. Future research should include identification of high-risk veterans for negative reintegration (Institute of Medicine, 2014), longitudinal data to better understand the reintegration trajectory, intervention efficacy data. Future directions also should include developing a collaborative formalized reintegration policy (VA Center for Innovation, 2017). The VA and Department of Defense can improve reintegration outcomes for returning veterans using an evidence-based guideline, such as the one proposed in this report. Further, since most veterans are treated in civilian institutions (Sayer et al., 2014), the proposed guideline could be particularly useful for providers unfamiliar with common reintegration risk factors and needs.
Figure 1. Clinical Practice Guideline for Post-9/11 US Veteran Reintegration

1. Following military exit, is the veteran at medium/high risk for negativity reintegation?
   - No
   - Baseline reintegration assessment
   - Provide resources available (i.e. programs)
   - Re-assess after 6 months, 1 year, then as needed
   - Is the veteran at medium/high risk?

   - Yes
     - Assess severity and related diagnoses (i.e. reintegration measures)
     - Encourage shared decision-making for treatment
     - Strengthen resilience (i.e. resources)
     - Support positive reintegration (i.e. interventions)
     - Re-assess reintegration outcomes based on intervention
References


Institute of Medicine. (2014). *Preventing Psychological Disorders in Service Members and Their Families: An Assessment of Programs.* https://doi.org/10.17226/18597


Chapter Four: Manuscript 3

The Influence of Resilience and Childhood Trauma on Reintegration Among Post-Deployment Post-9/11 US Veterans: A Holistic Investigation

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Abstract

Nearly half of post-9/11 United States (US) veterans experience reintegration challenges, including problems with social functioning, productivity, community engagement, and self-care. Further, this veteran cohort has unprecedented rates of psychological and/or physical injuries, such as post-traumatic stress disorder (PTSD), depression, and traumatic brain injury (TBI). Overlapping symptoms of these, and other commonly co-occurring, conditions have the potential to further impede reintegration. The primary aim of the study was to evaluate whether deployment stressors (deployment concerns and combat experiences) were associated with reintegration challenges in a cohort of post-deployed post-9/11 US veterans. In addition, the mediating role of resilience resources (family experiences and social support) on these relationships was assessed. A secondary aim was to assess whether interpersonal early life trauma moderated the association between deployment stress and reintegration challenges. This cross-sectional study used the Translational Research Center for TBI and Stress Disorders (TRACTS) prospective longitudinal cohort study database. Analyses revealed significant associations between deployment concerns and reintegration challenges, with social support mediating the relationship. A sensitivity analysis demonstrated that deployment concerns remained significantly associated with reintegration challenges among participants with interpersonal early life trauma. These significant relationships were not found with deployment combat as the exposure. Longitudinal research is warranted to understand the trajectory of reintegration among post-911 US veterans.

Keywords: veteran, reintegration, resilience, childhood trauma
The Influence of Resilience and Childhood Trauma on Reintegration Among Post-Deployment Post-9/11 US Veterans: A Holistic Investigation

Nearly 3 million United States (US) service members have been deployed to post-9/11 conflicts, mostly Operations Enduring Freedom, Iraqi Freedom, and New Dawn (OEF/OIF/OND) (Tanielian, Batka, & Meredith, 2017). Roughly 44% of this cohort demonstrate difficulties adjusting to civilian life post-deployment and 48% experience family challenges (Tanielian et al., 2017). Among combat-veterans seeking care at the Department of Veterans Affairs (VA), approximately 25-56% report “some” to “extreme” difficulty with social functioning, productivity, community engagement, and self-care (Sayer et al., 2010) as they reintegrate, or return and adapt to civilian life (Yosick et al., 2012). These challenges are a major concern for Congress (Blakeley & Jansen, 2013) and the VA (U.S. Department of Veterans Affairs, 2015), compounded by the growing number of US service members exiting the military (approximately 250,000 annually) (Office of the Chairman of the Joint Chiefs of Staff, 2014). Despite the complexities of reintegration outcomes, related studies are often embedded within specific diagnoses (i.e. post-traumatic stress disorder, traumatic brain injury) or domains (i.e. personal, vocational), thus often lacking conceptual or comprehensive perspective.

Lethal and traumatizing warfare inherent to current conflicts, coupled with longer and recurrent deployments, prompt complex reintegration challenges (Baiocchi, 2013). Deployment combat exposure has been associated with familial, vocational, and personal dysfunction among veterans (Balderrama-Durbin et al., 2015; Beder, Coe, & Sommer, 2011; Currier, Lisman, Irene Harris, Tait, & Erbes, 2013; Elbogen, Johnson, Wagner, Newton, & Beckham, 2012). A recent qualitative study investigated variations in deployment experiences, revealing that veterans’ experiences also included deployment demands and resources to also be important (Jennings, Melvin, & Belew, 2017). Interestingly, the authors identified personal resources, such as family communication during deployment, could be stressful or supportive. The authors recommended exploring deployment as a complex, multifactorial variable, particularly in terms of personal factors. Much of recent literature exploring deployment concerns have been investigated from a qualitative framework.

Symptom sequelae of common combat-related injuries, which includes post-traumatic stress disorder (PTSD), depression, and traumatic brain injury (TBI), may further exacerbate reintegration
challenges (Corby-Edwards, 2009; Currie, Day, & Kelloway, 2011; Defense and Veterans Brain Injury Center, 2014; Sayer et al., 2010). For example, challenging reintegration has also been associated with various psychological factors, such as substance use or alcohol misuse (Golub & Bennett, 2013; Wilcox et al., 2015), post-traumatic stress disorder (PTSD), and depression (Moriarty et al., 2015). Psychosocial factors that may influence reintegration include family (Balderrama-Durbin et al., 2015), relational (Larson & Norman, 2014), vocational (Adler et al., 2011), social functioning (Wingo et al., 2017), and personal functioning (Collinge, Kahn, & Soltsyik, 2012; Wilcox et al., 2015; Worthen, Moos, & Ahern, 2012). Additionally, deployment characteristics, female gender, and various age groups have been associated with negative personal, family, and/or work functioning (Beder, Coe, & Sommer, 2011).

Resilience involves the beliefs, actions, and abilities that promote coping (Brenner et al., 2015) and/or adaptation to challenging conditions (Earvolino-Ramirez, 2007; Yosick et al., 2012). It has been given national recognition for its significant role in optimizing veterans' health and functionality throughout reintegration (Dole et al., 2007). Yet, no known study has investigated the mediating role of resilience resources among post-9/11 US veterans with complex health and deployment-related needs.

Wingo et al. (2017) found that higher resilience was significantly associated with better social functioning among veterans, though they identified a possibly bidirectional relationship between resilience and social functioning. On the other hand, in a qualitative study assessing the lived experiences of veterans living with their parent’s post-military, Worthen et al. (2012) found that under certain situations, family support may hinder the veteran’s personal growth during reintegration.

Lazarus & Folkman (1984) suggest that the trajectory of stressful exposure and adaptation to past trauma may have predictive capabilities for future traumatic experiences. A recent study investigating resilience in older civilian adults with histories of childhood trauma found that higher lifetime trauma was associated with increased life satisfaction, possibly indicative of better adjustment ability (Maercker, Hilpert, & Burri, 2016). However, a study with Marines failed to demonstrate a synergistic effect from childhood trauma and combat exposure (Nash et al., 2015). In fact, research suggests that early life stress can predict aspects of adult psychopathology (Carr, Martins, Stingel, Lemgruber, & Juruena, 2013), resilience (Wright, Masten, & Narayan, 2013), and coping strategies (Lazarus & Folkman, 1984).
Despite a surfeit of reintegration literature, most studies have focused on distinct outcomes of reintegration or resilience. Little is known about factors that contribute to the trajectory of resilience or reintegration outcomes. The primary aim of this study was to evaluate whether deployment stressors, combat experience and deployment concerns, were associated with reintegration challenges in a cohort of post-9/11 veterans. It was hypothesized that higher levels of deployment stressors would be associated with worse levels of reintegration challenges. Additionally, it was hypothesized that post-deployment resilience resources, specifically family and social support, would mediate the association between deployment stressors and reintegration challenges. A secondary aim evaluated whether interpersonal early life trauma moderated the association between deployment stressors and reintegration challenges.

Theoretical Framework

To guide the study, a nursing conceptual framework, the Neuman Systems Model (Neuman, 1995), was integrated with a psychology-based middle-range theory, the Transactional Model of Stress and Coping (Lazarus, 1966; Lazarus & Folkman, 1987). The resulting System Theory of Stress, Resilience, and Reintegration (refer to Chapter 2, Figure 4) guided study development and interpretations of the results.

Methods

Sample and Setting

This cross-sectional study used the data repository from the Translational Research Center for TBI and Stress Disorders (TRACTS) prospective longitudinal cohort study. Detailed information about recruitment, inclusion/exclusion criteria, and measures in the battery has been previously described (McGlinchey, Milberg, Fonda, & Fortier, 2017). Briefly, TRACTS recruits post-9/11 active service members and veterans aged 18 to 65 at the time of the baseline visit. Participants in TRACTS were recruited mainly from the Greater Boston area via a recruitment specialist and from flyers within a metropolitan VA medical center. Eligible participants completed an informed consent and the extensive evaluation lasting 8-10 hours at the VA Boston Healthcare System. Participants were excluded if they had: history of neurological illness (Huntington’s, Parkinson’s, dementia, MS, etc.); history of seizure disorders unrelated to head injury; current diagnosis of schizophrenia, bipolar, or other psychotic disorder;
severe depression or anxiety, current active homicidal and/or suicidal ideation with intent requiring crisis intervention; cognitive disorder due to general medical condition other than TBI; and unstable psychological diagnosis interfering with accurate data collection, determined by consensus of at least two doctorate-level psychologists.

The TRACTS longitudinal cohort study is comprised of a convenience but representative sample of the medical, behavioral, and neurobiological conditions seen in post-9/11 US veterans, ranging from no diagnoses to several co-occurring TBI and/or psychiatric and behavioral conditions. In this study, we included veterans who had at least one deployment to a post-9/11 conflict. Veterans with moderate or severe TBIs were excluded from this study as they may have lingering effects that may influence outcomes. Four participants had moderate or severe TBIs in this sample, thus we could not control for this as a possible confounder.

The Institutional Review Board (IRB) of Human Studies Research at the Department of Veterans Affairs (VA) Boston Healthcare System and Northeastern University approved all research procedures.

**Data Collection: Measures**

The study used self-report questionnaires and semi-structured clinical interview data. All data were entered and verified by at least two study staff.

**Deployment Stressors.** The Deployment Risk and Resilience Inventory-2 (DRRI-2) (Vogt et al., 2013; Vogt, Proctor, King, King, & Vasterling, 2008; Vogt, Smith, King, & King, 2012) is a self-report measure with adequate reliability and validity among OEF/OIF veterans. The DRRI-2 has 17 possible subscales that can be used in silo. The following deployment stressors were evaluated in the study: 1) Deployment Combat Experiences (Section C subscale) and 2) Deployment Concerns (Section G subscale).

**Resilience Resources Mediators.** The study utilized post-deployment DRRI-2 subscales to assess the following resilience resources mediators: 1) Post-Deployment Support (Section O subscale); and 2) Post-Deployment Family Experiences (Section P subscale).

**Reintegration.** The Military to Civilian Questionnaire (M2C-Q) (Sayer et al., 2011) is a unidimensional 16-item self-report instrument with adequate reliability and validity among a national sample of OEF/OIF veterans. The M2C-Q assesses acceptable levels of home, work, relationship, and
community reintegration functioning. The authors define reintegration as adequate home, work, relational, and community functioning. The M2C-Q queries about important indicators of post-combat adjustment: interpersonal relationships, productivity, community participation, self-care, life activities, and perceived meaning in life.

**Early Life Trauma Sensitivity Analysis.** History of Early Life Trauma (ELT) was derived from the Traumatic Life Events Questionnaire (TLEQ), a 22-item self-report measure of potentially traumatic events with well-established reliability and validity (Kubany et al., 2000). Interpersonal Early Life Trauma (I-ELT) was defined using criteria established by Corbo et al. (2014) and includes positive responses on TLEQ interpersonal trauma items corresponding to a history of childhood sexual abuse, physical abuse, or family violence before age 18 (Corbo et al., 2014; Corbo, Amick, Milberg, McGlinchey, & Salat, 2016).

**Covariates.** The following demographic data were assessed: age, gender, ethnicity, deployment history (total duration of deployments, and total number of deployments), highest level of education completed, branch of service served, and unit type (Reserves/National Guard). Ethnicity was re-coded as white and other race as minority groups were not well represented in the study sample. Service branch was re-coded due to unequal representation of branches (Army, Navy/Air Force, and Marines; no participants in the study served in the Coast Guard). Education was assessed on a continuum and as a dichotomous variable: greater than vs. less than/equal to 12 years of education.

Mood, anxiety, and substance use disorders were assessed using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I/NP) Non-patient Edition (First, Spitzer, Gibbon, Williams, et al., 1995; First, Spitzer, Gibbon, & Williams, 1995), which is a validated semi-structured interview that assesses the lifetime or current (past-month) experience of DSM-IV Axis I psychiatric disorders (as defined by the American Psychiatric Association [APA]).

The Clinician-administered PTSD Scale (CAPS; Blake et al., 1990, 1995) is a structured clinician-administered interview corresponding to DSM-IV criteria for PTSD (as defined by the American Psychiatric Association [APA]) with adequate reliability and validity among veterans. A current (past month) and/or lifetime diagnosis of PTSD is made using the CAPS.

The Boston Assessment of TBI-Lifetime (BAT-L; Fortier et al., 2014; Fortier, Amick, Kenna, Milberg, & McGlinchey, 2015) is a semi-structured clinical interview with strong interrater reliability and
convergent validity were established among a sample of OEF/OIF veterans. The BAT-L assesses blast exposures and lifetime history of military and non-military TBIs, including TBI frequency and severity.

TRACTS scoring is calculated by consensus with at least three doctoral-level psychologists and based on DoD and VA criteria for TBI classification.

Current pain was assessed using a single ordinal-level question assessing current overall pain from the Short Form McGill Pain Questionnaire (Melzack, 1975).

Analysis Plan


Descriptive Statistics. Descriptive statistics included frequency and percent for categorical variables, and mean, standard deviation, and range for continuous variables. Univariate analyses described the distribution of single continuous variables, including a test for normality.

Confounding. Covariates were identified based on the literature and theoretical framework. Covariates were assessed as potential confounders if they met the following criteria: the covariate was 1) a risk factor for the outcome, independent of the exposure; 2) a risk factor for the exposure, independent of the outcome; and 3) not on the causal pathway. The following were assessed for associations (using linear regression) with the exposure/outcome: age, gender, ethnicity, deployment history (total duration of deployments, total number of deployments), highest level of education achieved, branch of service served, unit type (i.e. Reserves/National Guard), pre-deployment PTSD, and lifetime histories of mood (depression, anxiety) and alcohol/other substance use disorders. For mediation analyses, covariates also were assessed for association between the mediator and outcome (Valeri & VanderWeele, 2013; VanderWeele, 2016).

Forward selection model building strategy, proposed by Greenland (1989), to assess confounding was used to determine the final adjusted model. The covariate with the largest change in beta weight, greater than 10% change between the crude and adjusted model (Magnus, 2016), was added to the model as a confounder. This process was repeated until no additional covariates met the 10% change in beta weight cut-off.
**Linear regression.** Unadjusted and adjusted linear regression models were evaluated for each deployment stressor exposure and the M2C-Q outcome. All regression models met the normality and homogeneity of variance assumptions. Influential points were assessed using studentized R (≥3) and Cook’s D (≥4). The final adjusted models included variables that met the confounding criteria established above and did not meet the collinearity variance inflation factor (VIF) threshold of 4 (O’Brien, 2007).

**Causal Mediation Analysis.** A SAS macro created by Hayes (2018), *PROC PROCESS*, was used to perform causal mediation. The macro estimated model coefficients (total, indirect, and direct effects), standard errors, t- and p-values, and 95% confidence intervals (CIs) using ordinary least squares (OLS) regression. Standard errors and 95% CIs were computed using bootstrap (5,000 samples). Confounders associated with the exposure-outcome and mediator-outcome were controlled for in the macro. The SAS macro removed missing data prior to analyses, so the sample size analyzed for mediation was 108.

Models were decomposed into direct and indirect effects, adjusting for confounders associated with the exposure-outcome and mediator-outcome. More specifically, the direct effect model measured the association between the deployment stressor exposure and the reintegration outcome. The indirect model measured the association between the deployment stressor exposures and reintegration outcome that is mediated by post-deployment resiliency. Separate models were run for each deployment stressor exposure (combat and concern) separately and examined the resiliency moderators, post-deployment family experiences and support, as individual mediators rather than incorporating both mediators into the same model (Valeri & VanderWeele, 2013). The percentage of the model mediated was assessed by the proportion of total effect by the presence of the mediator: absolute values of the beta coefficient for the indirect effect divided by the beta coefficient for total effect (Alwin & Hauser, 1975; Hayes, 2009; Imai, Keele, & Tingley, 2010).

**Early Life Trauma Sensitivity Analysis.** Due to low numbers of participant responses in the non-interpersonal Early Life Trauma or no ELT sub-groups, a sensitivity analysis was performed to assess if participants with Interpersonal ELT (I-ELT) demonstrated different beta estimates in final adjusted multivariate linear regression and mediation models.
Results

Of the 121 participants who completed the M2C-Q and DRRI-2, four were excluded for having a history of moderate/severe TBI. One influential point was identified and deleted from analyses. The final sample size for analyses was 116. Missing data was minimal, and not related to the outcome or mediators. In the mediation analyses, the sample size was 108 after excluding participants with missing data.

Descriptive Statistics

The descriptive and clinical demographics for the sample, and subsample with interpersonal early life trauma, are presented in Table 1. Overall, the sample was Caucasian (71.30%), male (92.24%), and had an average age of 36.09 (SD 9.35). Most had greater than a high school education (73.28%) and were working either full or part-time (66.38%). Less than half were married (43.10%). Most served in the Army (64.66%), followed by Marines (25.86%), Navy (10.34%), and Air Force (6.03%), though these groups were not mutually exclusive. Nearly half served in the National Guard or Reserves (45.69%). Participants had been deployed for an average of 14.75 months, (SD 8.77), had an average of 1.62 deployments (SD 0.91), and had been home since deployment for 75.34 months (SD 40.51). These characteristics were similar among participants with Interpersonal Early Life Trauma (I-ELT).

Nearly half of the overall sample had a history of I-ELT (49.14%). Notably, of the nine females in the study, five had histories of I-ELT. Current overall pain was low in the overall sample. The average number of military-related TBIs ranged from 0-16, with an average of 0.97 (SD 1.94). More than half (70.69%) were diagnosed with post-deployment PTSD and lifetime alcohol use disorder (69.83%) and almost half had a lifetime diagnosis of mood disorder (49.14%). Participants with interpersonal early life trauma were more likely to have lifetime depression (61.40% vs. 49.14%), pre- and post-PTSD (24.56% and 78.95% vs. 12.93% and 70.69%, respectively), and current anxiety disorder (19.30% vs. 12.93%).

Average scores of the main measures were similar among the overall sample and the I-ELT subsample. Overall, participants demonstrated an average M2C-Q score of 17.89 (SD 13.17), which represents low levels of reintegration challenges. The deployment combat mean score was 18.64 (SD 10.81) and deployment concern of 36.03 (SD 952), meaning low levels of combat experiences but higher levels of concerns. Post-deployment family experiences had a mean score of 41.72 (SD 12.23) and post-
deployment support of 37.90 (SD 7.68), meaning higher levels of post-deployment family experiences and support.

Table 1. Descriptive and clinical demographics by total sample, Interpersonal Early Life Trauma (I-ELT)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall (n=116)</th>
<th>I-ELT (n=57)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n or mean</td>
<td>% or SD</td>
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<tr>
<td>Age</td>
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<td>Currently working full or part-time</td>
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<td>Ethnicity</td>
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<td>2.61</td>
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<tr>
<td>Separated</td>
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<td>Other, cohabitating</td>
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<td>Army</td>
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<td>Total duration of deployments in months</td>
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<td>Time since last deployment</td>
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<td>Total number of OEF/OIF deployments</td>
<td>1.62</td>
<td>0.91</td>
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<tr>
<td>Clinical variables</td>
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<tr>
<td>History of TBI during deployment</td>
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<td>n military TBIs</td>
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<td>PTSD- pre-deployment</td>
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<td>PTSD- current</td>
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<td>55.17</td>
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<td>PTSD- post-deployment</td>
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<td>70.69</td>
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<tr>
<td>Current Depression</td>
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<td>Current Anxiety disorder</td>
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<td>12.93</td>
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<tr>
<td>Current Substance use disorder</td>
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<tr>
<td>Current Alcohol Use disorder</td>
<td>13</td>
<td>11.21</td>
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<tr>
<td>Lifetime Depression</td>
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<tr>
<td>Lifetime Substance use disorder</td>
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<td>33.62</td>
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<tr>
<td>Lifetime Alcohol Use disorder</td>
<td>81</td>
<td>69.83</td>
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<tr>
<td>Current overall pain (0-5; 5=worse)</td>
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<td>1.00</td>
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<tr>
<td>No early life trauma</td>
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<td>27.59</td>
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<tr>
<td>Interpersonal life trauma</td>
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<tr>
<td>Non-interpersonal life trauma</td>
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Main measures (range)  

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<th>Measure</th>
<th>Overall (n=116)</th>
<th>I-ELT (n=57)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRRI: Deployment Combat (0-58)</td>
<td>18.64 (10.81)</td>
<td>18.48 (11.32)</td>
</tr>
<tr>
<td>DRRI: Deployment Concern (15-57)</td>
<td>36.03 (9.52)</td>
<td>38.98 (9.36)</td>
</tr>
<tr>
<td>DRRI: Post-deployment family experiences (12-60)</td>
<td>41.72 (12.23)</td>
<td>41.18 (12.47)</td>
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<td>DRRI: Post-deployment support (13-50)</td>
<td>37.90 (7.68)</td>
<td>36.88 (7.95)</td>
</tr>
<tr>
<td>Reintegration challenges (0-54)</td>
<td>17.89 (13.17)</td>
<td>18.58 (13.55)</td>
</tr>
</tbody>
</table>

Note: Service branch and ethnicity are not mutually exclusive.  
DRRI Deployment Combat: higher score = worse  
DRRI Deployment Concern: higher score = worse  
DRRI Post-deployment family experiences: higher score = better  
DRRI Post-deployment support: higher score = better  
Reintegration challenges: higher score = worse

Confounders

The following confounders were included in the base model per recommendations from the literature: age, gender, and race (Magnus, 2016). No additional covariates were significantly associated with the M2C-Q and deployment combat using simple linear regression. Lifetime depression had a significant association with the M2C-Q and deployment concerns and was assessed as a confounder.

Covariates associated with each mediator-outcome were also identified using simple linear regression. National Guard/Reserves unit type, current PTSD, and current overall pain were associated with both mediators (family, support) and the outcome (M2C-Q). These covariates were added to mediation analyses for both exposures (deployment concerns and combat). Regression assumptions were assessed and met for all unadjusted and adjusted models.

Deployment Concerns and Reintegration

Unadjusted and Adjusted Linear Regression. After adjusting for age, gender, ethnicity, and lifetime depression, the point estimate for deployment concerns reduced from .405 to .390 but remained positively and significantly associated with reintegration challenges (p<0.05; Table 2). Lifetime depression was the only other risk factor that remained positively associated with reintegration challenges (p<0.05; refer to Supplemental Table 1). Sensitivity analyses (refer to Table 2) demonstrated that among participants with I-ELT and while controlling for confounders, deployment concerns remained positively and significantly associated with reintegration challenges (p<0.05), with an increase in magnitude of the adjusted point estimate (0.390 vs. 0.480).
Table 2. Multivariate linear regression analysis, overall sample and Interpersonal Early Life Trauma (I-ELT) subsample

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Overall (n=116)</th>
<th>I-ELT (n=57)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted</td>
<td>Adjusted</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Std B</td>
</tr>
<tr>
<td>Deployment Concern(^a)</td>
<td>.405</td>
<td>.390</td>
</tr>
<tr>
<td>Deployment Combat(^b)</td>
<td>.106</td>
<td>.129</td>
</tr>
</tbody>
</table>

\(^a\)Confounders: age, gender, ethnicity, lifetime depression
\(^b\)Confounders: age, gender, ethnicity

\(^*\)P-value<0.05

Stb B = standardized beta

I-ELT = Interpersonal Early Life Trauma

Mediation and Sensitivity Analyses. The total effects of the models in the overall sample were not significant (95% CIs contained 0) but were in the I-ELT subsample. Post-deployment family and social support were not significant mediators of the association between deployment concerns and reintegration challenges (Table 3). However, for the direct effect of deployment concerns on reintegration, social support accounted for 12.58% of the association; less than 1% was mediated through post-deployment family experiences.

Among the participants with I-ELT, the association between deployment concerns and reintegration (i.e. direct effect) was stronger compared to the overall sample for both family (B = 0.4675 vs. 0.2257) and social support (B = 0.5646 vs 0.2416) mediation models. Post-deployment family experiences accounted for 30.59% of the total effect between deployment concerns and reintegration challenges, while post-deployment support accounted for 57.71%.

Table 3. Exposure: Deployment Concern by Overall and Interpersonal Early Life Trauma (I-ELT) sample

<table>
<thead>
<tr>
<th>Concern</th>
<th>Overall (n=108)</th>
<th>I-ELT (n=57)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>95% CI</td>
</tr>
<tr>
<td>(direct effect)</td>
<td>0.2257*</td>
<td>0.0175</td>
</tr>
<tr>
<td>Resilience Family</td>
<td>-0.0009</td>
<td>-0.1165</td>
</tr>
<tr>
<td>(indirect effect)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concern</td>
<td>0.2416*</td>
<td>0.0403</td>
</tr>
<tr>
<td>(direct effect)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resilience Support</td>
<td>-0.0270</td>
<td>-0.1331</td>
</tr>
<tr>
<td>(indirect effect)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Indirect effects are with bootstrapped 95% Confidence Interval’s (CI)

\(^*\)95% CI ≠ 0

I-ELT = Interpersonal Early Life Trauma

Percent mediated used absolute values
Deployment Combat Experiences and Reintegration

Unadjusted and Adjusted Linear Regression, Mediation Analyses, and Sensitivity

Analysis. Deployment combat experiences did not have a significant association with reintegration challenges, before or after adjusting for confounders (p> .05; refer to Table 2 and Supplemental Table 2). Compared to the overall sample, among participants with I-ELT, deployment combat remained nonsignificant while controlling for confounders, though the association of the relationship with reintegration challenges did decrease (B = .129 vs .014, respectively). No significant relationships were identified for direct or indirect effect between deployment combat experiences and reintegration challenges among the overall sample or the I-ELT subsample; thus, percentage mediated was not calculable due to nonsignificant total and direct effects (Table 4).

Table 4. Exposure: Deployment Combat by Overall and Interpersonal Early Life Trauma (I-ELT) sample

<table>
<thead>
<tr>
<th></th>
<th>Overall (n=108)</th>
<th>I-ELT (n=57)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>95% CI</td>
</tr>
<tr>
<td>Combat (direct effect)</td>
<td>0.0348</td>
<td>-0.1531</td>
</tr>
<tr>
<td>Resilience Family (indirect effect)</td>
<td>0.0032</td>
<td>-0.0861</td>
</tr>
<tr>
<td>Combat (direct effect)</td>
<td>0.0931</td>
<td>-0.0906</td>
</tr>
<tr>
<td>Resilience Support (indirect effect)</td>
<td>-0.0586</td>
<td>-0.1664</td>
</tr>
</tbody>
</table>

Note: Indirect effects are with bootstrapped 95% Confidence Interval’s (CI)
*95% CI ≠ 0
nc = not calculable
I-ELT = Interpersonal Early Life Trauma
Percent mediated used absolute values

Discussion

The present study assessed the association between deployment stressors (concerns and combat experiences) and reintegration challenges and whether post-deployment resilience resources (family and social support) mediated these associations. Small, but statistically significant, associations were found between deployment concerns and reintegration challenges, while controlling for age, gender, ethnicity, and lifetime depression. Due to low numbers of participants without early life trauma, a sensitivity analysis assessed if the strength of the association between deployment stress and reintegration challenges would differ among participants with I-ELT. A sensitivity analysis demonstrated an increase in the beta magnitude for participants with interpersonal early life trauma. Conversely,
deployment combat had negligible point estimates that were not statistically significantly associated with reintegration challenges. A sensitivity analysis demonstrated a decrease in the magnitude of the association between deployment combat and reintegration challenges, although it was nonsignificant. These relationships remained nonsignificant when assessing indirect effects of post-deployment family and social support.

Many studies have demonstrated positive associations among combat experiences and reintegration challenges, though deployment concerns had not been investigated empirically. For instance, Currier et al. (2013) found that combat experiences was significantly associated with worse cognitive processing but not posttraumatic growth, which could be seen as a positive reintegration outcome. Balderrama-Durbin et al. (2015) also found a significant relationship between combat experiences and family reintegration challenges among OEF/OIF Air Force service members. Similar to findings in the present study, a study with marines failed to demonstrate a synergistic effect from childhood trauma and combat experiences (Nash et al., 2015).

The present study assessed reintegration with a holistic measure, thus potentially masking distinct components of reintegration, such as social functioning. A previous study by Wingo et al. (2017) found that higher resilience was associated with better social functioning. Nonetheless, under certain situations family support may hinder the veteran’s personal growth during reintegration (Worthen et al., 2012).

**Strengths and Limitations**

Although this was a cross-sectional study, causal mediation was based on a chronological timeline. Further, strong theory helped establish causal order in the study. Theoretical congruency is necessary to maintain internal reliability and external validity (Magee, Lee, Giuliano, & Munro, 2006). In particular, Lazarus & Folkman (1984) recommend operationalizing coping with a multidimensional tool. Thus, the use of two post-deployment resilience resource measures improved reliability. Additionally, psychometrically sound instruments were used in the study. Statistical control of known and measured covariates related to both the exposure-outcome and mediator-outcome pairs reduced confounding bias. Though efforts were made to minimize bias, limitations still exist. Power may be low in this study due to
low number of participants who were administered the critical assessments, specifically the resilience and reintegration measures.

Residual confounding may be an issue due to imperfect measurements (Magnus, 2016), despite the use of psychometrically sound instruments. Other covariates may increase risk for reintegration challenges which were not available in the data, i.e. military sexual trauma (Brignone et al., 2016). Due to certain covariates (i.e. depression, anxiety, substance use) being measured as dichotomous responses, incomplete adjustment should be considered for confounding as these are broad categories. Statistical control for specific empirically and theoretically-driven extraneous variables reduced potential confounding bias. Residual confounding may still be present in the mediation analyses even though confounders related to the mediator and outcome were statistically controlled for in each mediation path.

Misclassification bias is a possibility in the study. Misclassification bias may exist as the mood, anxiety, and substance use disorders were assessed for current or lifetime history only, not pre-deployment. While lifetime histories of these diagnoses may have begun pre-deployment, a possibility remains that individuals with lifetime histories of these diagnoses may not have had pre-deployment diagnoses, thus over-exaggerating the influence of the confounder. Retrospective reports of coping (i.e. resilience measures) are also subject to misclassification biases; individuals may reconstruct memories and explain their actions or provide biased narratives.

Despite these limitations, findings of the study are expected to add valuable holistic understanding of deployment stress, resilience, and reintegration among post-9/11 US veterans. Future research should investigate bio-psycho-social functioning as a reintegration outcome in longitudinal studies of this cohort. Future studies also should assess diagnoses (i.e. TBI, PTSD, depression, substance use disorders, etc.) on a continuum rather than as dichotomous variables, as findings may shed more light on the associations with reintegration challenges. Assessment of specific functional reintegration domains is also warranted, which may clarify the relationship with deployment combat and concerns. Additionally, as outlined by the Institute of Medicine (2014), a common challenge is a lack of causal inference and assessment of risk and protective factors in studies. Thus, long-term reintegration outcomes are needed.
Conclusion

In a growing field of inquiry inundated with siloed investigations, this study explored deployment stressors, post-deployment resilience resources, early life trauma, and reintegration, within a holistic framework. Chronic reintegration challenges continue to impair veterans’ health, relationships, work performance, and overall wellbeing even decades later (Solomon, Shklar, Singer, & Mikulincer, 2006). The problem cannot be ignored and should be studied in a holistic manner. Identifying veterans at risk for reintegration is a key aspect of intervening (Institute of Medicine, 2014).
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Supplemental Tables

**Table 1.** Adjusted multivariate Regression Model; Exposure: Deployment Concern (n=116)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unadjusted</th>
<th>Adjusted (age, gender, race, lifetime depression)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Concern</td>
<td>0.41</td>
<td>0.12</td>
</tr>
<tr>
<td>Age</td>
<td>-0.11</td>
<td>0.13</td>
</tr>
<tr>
<td>Gender</td>
<td>-4.90</td>
<td>4.40</td>
</tr>
<tr>
<td>Race</td>
<td>-3.43</td>
<td>2.61</td>
</tr>
<tr>
<td>Depression</td>
<td>4.79</td>
<td>2.41</td>
</tr>
</tbody>
</table>

*P-value<0.05

Stb B = standardized beta
Table 2. Adjusted multivariate Regression Model; Exposure: Exposure Combat (n=116)

*P-value<0.05

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p-value</th>
<th>Stb B</th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p-value</th>
<th>Stb B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combat</td>
<td>0.11</td>
<td>0.12</td>
<td>0.90</td>
<td>0.37</td>
<td>0.09</td>
<td>0.13</td>
<td>0.12</td>
<td>1.05</td>
<td>0.29</td>
<td>0.11</td>
</tr>
<tr>
<td>Age</td>
<td>-0.15</td>
<td>0.14</td>
<td>-1.04</td>
<td>0.30</td>
<td>-0.15</td>
<td>0.14</td>
<td>0.30</td>
<td>-1.04</td>
<td>0.30</td>
<td>-0.15</td>
</tr>
<tr>
<td>Gender</td>
<td>-7.13</td>
<td>4.83</td>
<td>-1.47</td>
<td>0.14</td>
<td>-0.15</td>
<td>0.42</td>
<td>0.81</td>
<td>-0.15</td>
<td>0.42</td>
<td>-0.08</td>
</tr>
</tbody>
</table>

Stb B = standardized beta
I-ELT= Interpersonal Early Life Trauma
Chapter Five:
Summary and Conclusions

Anna G. Etchin
Northeastern University
Bouvé College of Health Sciences
School of Nursing
Summary and Conclusions

The purpose of this dissertation was three-fold. Manuscript One provided an integrated theory that guided aspects of the next two manuscripts. Manuscript Two described the state of the science regarding post-9/11 US veteran reintegration and proposed a clinical practice guideline. Finally, Manuscript Three presented findings from a cross-sectional study among a sample of post-deployed post-9/11 US veterans.

**Manuscript Findings**

**Manuscript One**

Despite awareness of the value of theoretically-driven research, nursing reports demonstrate trends of lacking theory (Bond et al., 2011). Theory is fundamental to carry out systematic, critical research (Fawcett, 1999). Theory-driven research is thus particularly useful for studying complex phenomena, such as military to civilian reintegration. A system-based theory captures the essence of synergistic building blocks that make up the whole (Meadows & Wright, 2008; Neuman, 1995). A nursing conceptual model, Neuman’s Systems Model (NSM) (Neuman & Fawcett, 2011), and a psychology theory, the Transactional Model of Stress and Coping (TMSC) (Lazarus, 1966; Lazarus & Folkman, 1987) were integrated. A Conceptual-Theoretical-Empirical (C-T-E) model was created using integrated concepts from NSM and the TMSC. The C-T-E model was relevant for hypothesis testing but lacked deeper theoretical relationships. Thus, the integrated System Theory of Stress, Resilience, and Reintegration was developed and explained.

**Manuscript Two**

The System Theory of Stress, Resilience, and Reintegration was used as an organizing framework for Manuscript Two. Aspects of negative reintegration have been associated with combat exposure (Balderrama-Durbin et al., 2015; Beder, Coe, & Sommer, 2011; Currier, Lisman, Irene Harris, Tait, & Erbes, 2013; Elbogen, Johnson, Wagner, Newton, & Beckham, 2012), deployment characteristics (i.e. duration, idle time) (Baiocchi, 2013; Institute of Medicine & National Academies Press, 2010), and individual demographics (i.e. non-white ethnicity, mental health diagnoses) (Beder, Coe, & Sommer, 2011). Resiliency and resilience resources (i.e. social support) have been associated with positive reintegration outcomes. Perceived reintegration experiences include re-defining roles and identities
Management strategies and clinical recommendations via a reintegration clinical practice guideline was proposed and described. The Departments of Veterans Affairs (VA) and Defense (DoD) can improve reintegration outcomes for returning veterans using an evidence-based guideline such as the one developed. Further, since most veterans are treated in civilian institutions (Sayer, Carlson, & Frazier, 2014), the guideline could be particularly useful for providers unfamiliar with common reintegration risk factors and needs.

**Manuscript Three**

This cross-sectional study was guided by and interpreted within the System Theory of Stress, Resilience, and Reintegration from Manuscript One. This database study used the data repository from the Translational Research Center for Traumatic Brain Injury (TBI) and Stress Disorders (TRACTS) longitudinal prospective cohort study (McGlinchey, Milberg, Fonda, & Fortier, 2017). We found statistically significant associations between deployment concerns and reintegration. We also found that interpersonal early life trauma moderated this relationship. Furthermore, post-deployment social support accounted for 12.58% of the total effect, while family support accounted for less than 1%. Although we were not sufficiently powered to explore the moderating role of early life trauma, our sensitivity analysis demonstrated changes in point estimates between deployment concerns and reintegration challenges. Among participants with interpersonal early life trauma, both family and social support (resilience resources) accounted for greater than 10% of the total effect (30.59% and 57.71% respectively). This highlights the importance of strengthening resilience resources to mitigate challenging reintegration outcomes among this veteran cohort. Surprisingly, these findings were not significant when assessing deployment combat experiences as the exposure for reintegration. Findings of this study suggest that deployment perceptions are important to explore as a potential risk factor for negative reintegration.

**Conclusions**

Collectively, findings of these manuscripts have multi-modal implications for advancing nursing science and practice. First, integration of inter-professional frameworks allowed exploration of military to civilian reintegration and related concepts from a holistic and collaborative perspective. Second,
development of reintegration clinical practice guidelines fills a gap in the literature and promotes evidence-based reintegration management. Finally, evaluation of complex relationships of childhood trauma, deployment stressors, resilience resources, and reintegration outcomes provided much-needed insight into a growing field of inquiry. Among post-9/11 US veterans, the Adapted System Theory of Stress, Resilience, and Reintegration is a suitable framework for exploring holistic and complex relationships.
References


