HHS Public Access

Author manuscript

Mil Behav Health. Author manuscript; available in PMC 2018 November 28.

Published in final edited form as:

Mil Behav Health. 2017 ; 5(4): 313–323. doi:10.1080/21635781.2017.1343694.

Marital Satisfaction, Family Support, and Pre-Deployment Resiliency Factors Related to Mental Health Outcomes for Reserve and National Guard Soldiers

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Abstract

The purpose of this study is to examine the relationship between resiliency factors and mental health outcomes among US Army Reserve and National Guard soldiers. Our results demonstrate that higher marital satisfaction is significantly associated with lower anger, depression, anxiety, and PTSD. Importantly, our results provide evidence that among the assessed resiliency factors (pre-deployment preparation, unit social support, martial satisfaction and family support), marital satisfaction has the strongest evidence for promoting resiliency. Future research should develop interventions that can be provided jointly to the soldier and his partner to facilitate stronger relationships and promote improved mental health and reintegration post-deployment.

Keywords

resiliency; mental health; reserve soldiers; marital satisfaction; post-deployment; social support; anger; anxiety; depression; PTSD

INTRODUCTION

Military personnel are at increased risk for many mental health problems, notably PTSD, but also depression, anxiety, and anger, as a result of deployment and combat exposure. United States' Reserve and National Guard (NG) soldiers are deployed and experience combat at the same rates as active duty soldiers (Thomas et al., 2010). Studies report mixed results on reservists' susceptibility to mental health problems; in some cases finding rates comparable to those of active duty soldiers (Kim, Thomas, Wilk, Castro, & Hoge, 2010; Thomas et al., 2010). However, other studies have found increased rates of mental health diagnoses, most

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notably PTSD and depression, among reserve and National Guard veterans (Griffith, 2010; Seal, Bertenthal, Miner, Sen, & Marmar, 2007). A large (88,235) longitudinal study of post-deployment health assessments found that 42.4% of reserve soldiers were in need of treatment for mental health issues, such as PTSD, depression and interpersonal conflict, compared to only 20.3% of active duty soldiers (Milliken, Auchterlonie, & Hoge, 2007). National Guard soldiers also appear to be at increased risk some months after deployment; 3–12 months post-deployment rates of mental health concerns among National Guard soldiers increased significantly compared to active duty soldiers (Thomas et al., 2010). Reserve component soldiers also have been shown to access mental health care at significantly higher rates than active duty soldiers (Kim et al., 2010).

In addition to PTSD and depression, NG/reserve soldiers are subject to many other challenges as a result of their unique status embedded within civilian, rather than military, communities (Castaneda et al., 2008). These include employment and financial problems (Griffith, 2015; Riviere, Kendall-Robbins, McGurk, Castro, & Hoge, 2011), relationship and family difficulties (Faber, Willerton, Clymer, MacDermid, & Weiss, 2008; Griffith, 2010), and other emotional difficulties. Rates are particularly high for anger; approximately half of NG/reserve soldiers report anger control problems (Sayer et al., 2010; Worthen et al., 2014). These differences may be attributable to the unique experience of NG/reserve soldiers with their return to civilian status post-deployment. Compared to active duty soldiers and military families, NG/reserve soldiers and their families may be inexperienced with extended absences, lack ongoing peer interaction with other veterans, and have limited access to military health facilities and other resources (Griffith, 2010; Lapp et al., 2010; Renshaw, 2010; Riviere et al., 2011; Thomas et al., 2010; Wheeler & Stone, 2010). Family and spousal relationships may be of particular importance as support mechanisms for NG/reserve soldiers who lack continuous interaction with fellow soldiers and military structures.

Using the socio-ecological model as a conceptual framework, we identified possible factors at multiple levels that may serve as resiliency factors against adverse mental health outcomes among National Guard and reserve soldiers. Bronfenbrenner's (Bronfenbrenner, 1977, 1994) multilevel ecological model consists of a series of nested systems which interact to impact individual behavior. The microsystem involves the immediate environment such as family, peer group and the workplace. The mesosystem describes the linkage between two or more microsystems (e.g., family and the workplace). The macrosystem describes culture or subculture such as customs, life styles, hazards and life course options that are part of the overall system. The final system, the chronosystem, describes change or consistency over time, and how change in structure, readiness, and everyday life impacts the individual. This theoretical framework has recently been applied to examine suicidal ideation in the US Air Force with the notion that considering only individual level risk factors would not be sufficient for prevention and intervention efforts. (Langhinrichsen-Rohling, Snarr, Slep, Heyman, & Foran, 2011) Dahlberg (Dahlberg & Butchart, 2005) and the US Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, 2009) have adapted this to form a framework for prevention of negative outcomes. In this adaptation, the nested levels (and examples) include the individual (e.g., person specific behaviors), relationship (e.g., intimate partner, peer groups), community (e.g., settings such as workplace), and societal (e.g., social norms). Our conceptualization of social and

environment influences is broad, encompassing relationship, community, and societal components of the model while also considering individual level factors. Possible resiliency factors were identified from the literature to encompass these multiple levels of influence around the individual soldier, such as military experiences (community level in the model, i.e. deployment preparation, unit support) and family and spousal relationships (relationship level in the model).There is a growing body of work around these social-ecological factors and the ways in which they may promote resiliency, particularly as they relate to PTSD. Some research has focused on demographic factors linked to various mental health outcomes for military personnel; for example higher education and employment have been demonstrated to be protective against anger (Elbogen et al., 2010; Worthen et al., 2014). However, to our knowledge, experiential and social factors that may be protective for other mental health outcomes, such as depression, anger and anxiety have not been extensively studied in military populations.

Previous work has found that high levels of unit support are associated with lower odds of PTSD (Goldmann et al., 2012) and that NG/reserve veterans with PTSD scored significantly lower on unit support and post deployment social support (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009). However, other studies have found no association between unit support and PTSD in NG/reserve samples (Polusny et al., 2011; Renshaw, 2010; Tracie Shea, Reddy, Tyrka, & Sevin, 2013). However, lower perceived unit support was associated with depression (Polusny et al., 2009). Brailey et al. found that higher levels of unit cohesion were beneficial for individuals exposed to significant stress during their military career and that indirectly, unit cohesion attenuates the impact of life experiences on PTSD (Brailey, Vasterling, Proctor, Constans, & Friedman, 2007).

The findings around perceived preparation for deployment as a resiliency factor are similarly mixed and ambiguous. Studies have shown that higher levels of preparedness are associated with lower odds of PTSD (Goldmann et al., 2012) and that perceptions of less military preparedness predicted new onset PTSD in NG soldiers (Polusny et al., 2011) and are associated with increased risk of depression (Polusny et al., 2009). However, military preparedness became non-significant for PTSD when controlling for post-deployment factors, such as social support (Polusny et al., 2011). Similarly, Shea et al. found that preparation was modestly protective against PTSD among NG/reserve soldiers, but only in “lower-level” combat experiences (Tracie Shea et al., 2013). Finally, Renshaw demonstrated that preparedness did not moderate the association between deployment experiences and PTSD, but did moderate the relationship between combat experiences and perceived threat (i.e. NG soldiers who felt more prepared had a more realistic appraisal of threat than those with lower perceived levels of preparation) (Renshaw, 2011).

In terms of post-deployment factors, the focus has primarily been on social support broadly defined and family relationships. In many cases, post-deployment social-ecological factors seem to be more strongly associated with mental health outcomes than military experience factors (Goldmann et al., 2012; Polusny et al., 2011). For example, Polusny et al. demonstrated that the development of PTSD post-deployment was associated with lower social support and greater life stress events (Polusny et al., 2011). Another study found that

high levels of post-deployment support appear to be protective against PTSD, even if pre-deployment variables (preparation and unit support) are low (Goldmann et al., 2012).

Given the primacy of marital and family relationships as a source of social support, these are essential factors to consider, separate from broader perceptions of post-deployment support. Numerous studies have explored the effects of service-related mental health problems, such as PTSD, on marital relationships (Dekel & Monson, 2010; Monson, Taft, & Fredman, 2009; Solomon, Dekel, & Zerach, 2008; Taft, Watkins, Stafford, Street, & Monson, 2011) but there is a lack of research on the potentially reciprocal relationship between intimate relationship problems and PTSD (Monson et al., 2009). To our knowledge, marital satisfaction has not been examined as a protective factor that may reduce the incidence and/or severity of post-deployment mental health concerns. However, evidence from studies examining other health outcomes and behaviors in non-military populations, have demonstrated that individuals married to partners who ate more healthy foods, exercised, and completed other preventive health measures before marriage were more likely to increase those positive behaviors in the years following the marriage (Homish & Leonard, 2008). In addition, relationship satisfaction with one's partner promotes resiliency against substance use. For example, over the first four years of marriage, higher levels of marital satisfaction were protective against subsequent alcohol problems for both husbands and wives (Leonard & Homish, 2008). Specific to military populations, one study found that veterans with PTSD reported lower partner satisfaction and less family cohesion than those with no PTSD (Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012). Among veterans with chronic PTSD, spouses were seen as both resources and sources of stress, but ultimately spousal and other social relationships had little influence on severity of PTSD symptoms (Laffaye, Cavella, Drescher, & Rosen, 2008). Reservists with stronger relationships, and those with children, were more likely to report that they coped well or very well with deployment (Castaneda et al., 2008) and family stress during deployment has been found to be a significant predictor of PTSD (Tracie Shea et al., 2013).

In the context of the overwhelming predominance of studies related to PTSD in the literature, and the lack of attention to intimate partner/spousal relationships, the goal of this study was to broaden the examination of possible resiliency factors, to include marital satisfaction and family support in conjunction with military variables, and to examine a range of outcomes related to poor mental health and general negative affect, including anger, depression, anxiety and PTSD. This work is a part of an ongoing longitudinal study (Operation: SAFETY (Soldiers and Families Excelling Through the Years)) that is more broadly focused on the health of NG/reserve soldiers and their spouses.

METHODS

Data Collection

Recruitment—The Operation: SAFETY study recruited US Army Reserve and Army National Guard soldiers and their partners over a 15-month period (Summer 2014 – Fall 2015). Research project staff attended unit drills throughout the upstate New York region. The protocol was approved by The State University of New York at Buffalo's Institutional Review Board. Prior to attending weekend drills, the protocol was vetted through the Army

Human Research Protections Office, Office of the Chief, Army Reserve as well as the Adjutant General of the National Guard. Research staff then made arrangements with unit commanders to attend drills. At the drills, soldiers were given a 10-minute overview of the project. This overview explained the project goal of exploring how the health and well-being of reserve soldiers and their partners may impact each other's physical and mental well-being over time. Soldiers were told their participation, as well as that of their partners, would involve the completion of three online confidential surveys (baseline with two yearly follow-ups). No medical assessments or record reviews were to be conducted. Confidentiality procedures were discussed, including standard research protocol procedures (i.e., name not stored with data, use of identification numbers, password protected computers, etc.) as well as the assurance that the military would not know who participated. Further, potential participants were told that their partner would not learn of their responses. Additionally, participants were informed that a certificate of confidentiality was obtained from the US Department of Health and Human Services to protect participant information from being disclosed in response to court or other legal orders.

Soldiers were told the questionnaire covered a variety of general health topics such as nutrition, physical and mental health, caffeine intake, sleep, substance use, romantic relationship, and deployment information and events. The baseline survey length was approximately 2 ½ hours, while the follow-ups were 90-minutes in duration. For their time, soldiers and their partners each would receive a $60 check for baseline and $70 for each of the follow-ups ($200 per person/$400 couple over the study period). After the briefing and once all questions were answered, soldiers were invited to complete a brief, one page screening form. All soldiers were provided an information packet to take home and share with their partner.

Soldiers were screened on six inclusion criteria: (1) the couple is married or living as if married; (2) one member of the dyad is a current Army Reserve Soldier or National Guard Soldier; (3) the soldier is between the ages of 18 and 45; (4) both partners are able to speak and understand English; (5) both partners are willing and able to participate; and (6) both partners have had at least one alcoholic beverage in the past year. Following this in-person screening, all soldiers were contacted within one week regarding their eligibility status. Ineligible participants were notified by email. Eligible participants were contacted via phone to review study objectives and confidentiality procedures. Potential participants were asked if they shared the study folder documents with their partner and if they both were willing to participate. Upon agreement, interviews were then scheduled.

We attended 47 recruitment events across New York State and met with 47 units. We received 1653 screening forms; 922 did not qualify for the study (579 were single, 329 failed on one or more screening items; M=1.5[.09], and 14 were incomplete.) The remaining 731 were eligible for the study. Of those, 572 (78%) agreed to participate and 83% of couples (N=472) completed some part of the survey. Among the men, 435 completed the entire survey, while 7 started but did not finish. Female participants completed 440 surveys and 14 additional surveys were started but not completed. There were 7 same sex couples. Given that the nature of the main study was to examine spousal influence, only surveys where both partners completed the entire survey were included for follow-up (N=418). We examined the

differences between those that passed and enrolled vs those who passed and did not enroll based upon the screening form. The only significant difference occurred when a civilian partner screened for the study (n=11). These couples were less likely to enroll (p<.001). No differences existed within the soldiers' screening health variables between those who enrolled and completed vs those who enrolled and did not complete. For this work, we present data from a subset of the main study based upon male soldiers with combat experience (N=248).

Survey Administration—It is common for NG/reserve soldiers to live great distances from their unit location. It is also possible for soldiers to be deployed during the study. For these reasons, the surveys were administered through a secure HIPAA-compliant online survey programming software, StudyTrax™ which allowed for data encryption. Soldiers and partners who lived in the Western New York area were invited to the State University of New York at Buffalo Center for Health Research (UBCHR) to complete their online surveys. Partners could come in together or separately, and were each given a private room with a touchscreen computer on which to complete their survey. Informed consent was conducted with a research staff member. For soldiers and partners outside of the Western New York area, separate login information was sent to each partners' email. The first time a participant signed in they were prompted to create their own unique password and then were given the online consent form. This form was the same as the consent given to in-person participants, and the study's phone number was listed for participants to call with any questions. Once the participant completed the consent process, s/he gained access to the survey.

Participants

The sample for the present work is composed of male soldiers with combat experience (248 male soldiers). These soldiers have an average of 11.9 (SD: 6.0) years of military service (Table 1). Most of the soldiers in the sample are enlisted rank (84.7%).The majority of the sample is non-Hispanic White (81.1%), with at least some college education (60.1%) or a college degree (25.81%). Income is fairly well-distributed across several ranges, with an average household income bracket of $60,000 to $79,999. Soldiers in our sample have an average age of 33.4 (SD: 6.2) years and most are married (75.4%), with the remainder living as if married.

Measures

Anger/hostility—The PROMIS Anger scale (Pilkonis et al., 2011) is an 8-item self-rated measure of anger over the past seven days (alpha: .94). It is scored on a 5-point scale ranging from 1 (Never) to 5 (Always), with a possible total score ranging from 8 to 40; greater scores indicate greater anger. Example items include, "I was irritated more than people knew," "I felt annoyed," and "I felt angry." It examines angry mood, negative social cognitions and efforts to control anger, rather than physical aggression items.

Depressive symptoms—The Patient Health Questionnaire 8 (PHQ-8) (Kroenke et al., 2009) is used for screening, diagnosing, monitoring, and measuring the severity of depression over the past 2 weeks with 8 items that range from 0 (Not at all) to 3 (Nearly every day). Higher scores indicate greater depressive symptoms (alpha: .90). The PHQ-8

maps onto the DSM-IV diagnosis for depression; however, it eliminates the item on suicidal or self-injurious thoughts. Due to the web-based assessment, immediate intervention could not be ensured for participants at great risk for immediate self-harm.

Anxiety symptoms—Anxiety is assessed with 10 items based upon the "emerging measures" from DSM-5 (Craske et al., 2013). The items examine the past 7 days on a 5-point scale ranging from 0 (Never) to 4 (All of the time) with higher scores indicating greater severity of anxiety. The measure has been found to be reliable and easy to use in the DSM-5 Field Trials. Example items include, "I felt uneasy" and "I felt nervous" (alpha: .91).

Post-traumatic Stress Disorder Symptomatology—The PTSD Checklist, based upon DSM-5 (Weathers, Litz, Herman, Huska, & Keane, 1993), assesses symptoms of PTSD in soldiers and their spouses. This is a 20-item self-report measure of PTSD symptoms over the past month; greater scores indicate greater severity of PTSD. Each response is rated on a 5-point Likert-type scale ranging from 0 (Not at all) to 4 (Extremely), with an overall range of 0–80 (alpha: .95). It has good psychometric properties (correlation with structured interview for PTSD, r =.93) (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). This version has been adapted from the original version to specifically map back to DSM-5 (Bovin et al., 2015).

Deployment preparation—The Deployment Risk & Resiliency Inventory-2 (DRRI-2) (Vogt, Smith, King, & King, 2012) is comprised of 17 measures assessing risk and resiliency factors associated with military deployments and stressors. The scales have been shown to be reliable and valid across various groups of service members and individual scales can be administered independently of the larger 17-measure inventory. The deployment preparation scale is comprised of 10 items examining soldiers' perceptions of deployment readiness (alpha: .93). Soldiers report on their most recent deployment. Items are on a 5-point Likert-type scale ranging from 1 (Strongly disagree) to 5 (Strongly agree) and summed for an overall score range of 10–50 with higher scores indicating higher perception of deployment readiness. Example items include, "My military duties and assignments were what I expected," and "The training I received taught me everything I needed to know for deployment."

Unit social support—Perceptions of social support from unit leaders and unit members during their most recent deployment is examined with 12 items from the Unit Social Support measure from the DRRI-2 (Vogt et al., 2012). Scores are summed with an overall range from 12–60 with higher scores indicating soldiers' perceptions of higher unit support. Example items include, "My service was appreciated by the leaders in my unit," and "I felt valued by my fellow unit members" (alpha: .96).

Marital satisfaction—Relationship functioning is assessed with the Marital Adjustment Test (MAT) (Locke & Wallace, 1959). This 15-item instrument has been well validated in measuring overall marital satisfaction and adjustment of husbands and wives to each other. Scores range from 2 to 158, with higher scores indicating greater relationship adjustment (alphas: .76 males; .79 females).

Family support—The extent to which the soldier felt emotionally supported and able to count on family and friends to carry out necessary functions at home during their most recent deployment is assessed through the Deployment Support from Family and Friends scale from the DRRI-2 (Vogt et al., 2012). This measure consists of 8 items on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree), with higher scores representing greater perceived family support during their most recent deployment. Sample items include, “During my deployment, family members and/or friends back home were sincerely interested in hearing what was going on with me;” “During my deployment, relatives or friends at home could be counted on to take of my finances, property, or belongings, if needed” (alpha: .95).

Combat exposure—Following methods described by Vogt and colleagues (2012), participants reported on objective events and circumstances occurring in their most recent warzone experience. Items include things such as, “I went on combat patrols or missions,” “I was exposed to hostile incoming fire,” and “I was involved in searching and/or disarming potential enemy combatants.” The scale consists of 17 items on a 6-point Likert scale ranging from 1 (Never) to 6 (Daily or almost daily) (alpha: .94). Scores range from 17–102 with higher scores indicating greater combat exposure. For our analysis, we dichotomized combat exposure into high exposure (top 25th percentile of the scale) vs. lower exposure (remaining 75th percentile).

Military factors—*Military years of service*. Participants were asked to report length of time in the US Army Reserve, National Guard, and other service branches. A cumulative sum was created across all service branches*. Rank.* Soldier rank was dichotomized into enlisted vs officer.

Analytic Approach

Analyses were limited to male soldiers with combat exposure (N=248). Descriptive statistics were used to characterize this sample. Unadjusted linear regression models examined each resiliency factor (deployment preparation, unit support, marital satisfaction, and family support) individually for each mental health dependent variable (anger, depression, anxiety, and PTSD). Adjusted linear regression models examined the four resiliency factors for each mental health dependent variable, controlling for combat exposure, partner’s marital satisfaction, years of service, and rank. Model assumptions were examined through an inspection of residual vs. fitted plots and leverage/residuals plots.

RESULTS

Descriptive Results

Soldiers in our sample had an average combat exposure score of 32.2 (range: 16–102) indicating a range of combat experiences. Among this sample, a third of soldiers had at least mild depression (34.0%), with an average depression score of 3.7 (SD =4.4) (Table 2). Nearly eight percent of the sample met criteria for a PTSD diagnosis (7.7%). For anxiety, more than half the sample had mild anxiety (58.1%), and 13.3% had moderate to severe anxiety. The average anger score was 18.2, indicating that the present sample has greater

anger than the general population (Pilkonis et al., 2011). Almost a third of soldiers (28.6%) and nearly a quarter of their female partners (23.4%) reported marital satisfaction scores in the range of clinically significant relationship problems. Soldiers also indicated moderate to high levels of deployment preparation (mean: 37.3, range: 10–50), unit support (mean: 45.7, range: 12–60), and family support (mean: 33.9, range 8–40).

Regression Models

All results are presented in Table 3.

Anger—In unadjusted models, greater deployment preparation (b: −0.13, $p<0.01$), greater unit support (b: −0.11, $p<0.01$), and greater marital satisfaction (b: −0.10, $p<0.001$) were each independently associated with lower levels of anger. Family support was not associated with anger ($p>0.05$).

The adjusted model examined anger with all four resiliency factors, controlling for partner's marital satisfaction, combat exposure, years of military service, and rank. Increased unit support (b: −0.12, $p<0.01$) and increased marital satisfaction (b: −0.11, $p<0.001$) were both associated with lower levels of anger, while controlling for partner's marital satisfaction, combat exposure, years of service, and rank. Neither deployment preparation nor family support were significantly associated with anger ($p>0.05$) in this model.

Depression—In unadjusted models, higher levels of marital satisfaction (b: −0.05, $p<0.001$) and increased family support (b: −0.08, $p<0.05$) were each independently associated with lower levels of depression. Neither unit support nor deployment preparation were associated with depression ($p>0.05$).

In the adjusted model, greater levels of marital satisfaction (b: −0.05, $p<0.001$) were associated with less depressive symptoms while controlling for partner's marital satisfaction, combat exposure, years of service, and rank. Deployment preparation, unit support, and family support were not significantly associated with depressive symptoms ($p>0.05$) in this model.

Anxiety—In unadjusted models, higher levels of marital satisfaction (b: −0.06, $p<0.001$) were related to less anxiety. Deployment preparation, unit support, and family support were not associated with anxiety symptoms ($p>0.05$).

The adjusted model examined changes in anxiety symptoms with all four resiliency factors, controlling for combat exposure, rank, partner's marital satisfaction, and years of service. In this model, the only resiliency factor associated with anxiety symptoms was husband's marital satisfaction such that higher levels of marital satisfaction were related to less anxiety (b: −0.06, $p<0.001$), while controlling for wife's marital satisfaction, combat exposure, years of service, and rank. Deployment preparation, unit support, and family support were not significant resiliency factors ($p>0.05$) in this model.

PTSD—In unadjusted models, greater levels of deployment preparation (b: −0.25, $p<0.01$), marital satisfaction (b: −0.14, $p<0.001$), and family support (b: −0.31, $p<0.01$) were each

independently associated with fewer PTSD symptoms. Unit support was not significantly associated with PTSD symptoms ($p>0.05$).

The final adjusted model examined changes in PTSD symptoms associated with all four resiliency factors while controlling for combat exposure, rank, partner's marital satisfaction, and years of service. Greater levels of deployment preparation (b: −0.19, $p<0.05$) and marital satisfaction (b: −0.12, $p<0.001$) were associated with less PTSD symptoms, while controlling for wife's marital satisfaction, combat exposure, years of service, and rank. Unit support and family support were not significant ($p>0.05$) resiliency factors in this model.

DISCUSSION

Overall, our results demonstrate that higher marital satisfaction is significantly associated with lower anger, depression, anxiety, and PTSD for National Guard and reserve soldiers. Importantly, our results provide evidence that among these four key resiliency factors (marital satisfaction, family support, unit support and deployment preparation), marital satisfaction has the strongest evidence for promoting resiliency. There was some evidence, however, that these other factors also played a role in promoting resiliency against negative mental health outcomes.

Deployment preparation was significantly associated with lower PTSD in both unadjusted and adjusted models. Other studies, have demonstrated that perceived deployment preparation may be a moderating factor for PTSD, but is not a main effect (Polusny et al., 2011; Renshaw, 2011; Tracie Shea et al., 2013). Renshaw found that deployment preparation influenced soldiers' perceptions of threat in combat situations and thereby influenced PTSD outcomes (Renshaw, 2011). Future work is needed in this area to understand in greater detail the ways in which preparation for deployment, threat and combat exposure impact soldiers' mental health.

Perceived unit support was only associated with one of the mental health outcomes. There was no significant association between unit support and PTSD in the unadjusted or adjusted model, a finding that is consistent with some previous studies (Polusny et al., 2011; Renshaw, 2010; Tracie Shea et al., 2013). Likewise, unit support was not significantly associated with either anxiety or depression. However, evidence from our study suggests that unit support may be a resiliency factor for anger. Other work has demonstrated that greater perceived support and connection with peers is a potential protective factor against depression (Brenner, Homaifar, Adler, Wolfman, & Kemp, 2009; Pietrzak et al., 2010; Van Voorhees, Gollan, & Fogel, 2012) and ameliorates difficulties encountered during transitions between military and civilian life (Ahern et al., 2015). We also know from previous work that veterans report feeling more comfortable speaking about their experiences with other veterans who understand them (Hinojosa & Hinojosa, 2011; Laffaye et al., 2008). The "buddy system" within the military has long been documented as a form of peer support that may help protect against adverse mental health outcomes and facilitate resiliency under combat stress (Little, 1964).

Although in the unadjusted model, less family support was associated with higher depression and PTSD, these results were non-significant when controlling for combat exposure, partners marital satisfaction, years of service and rank, and family support was not significantly associated with any outcomes in the adjusted model. Other studies, however, have demonstrated the importance of family-level interventions in promoting resiliency and mitigating negative outcomes (Fischer et al., 2015; Lester et al., 2012). It is likely that family support does have an impact on mental health outcomes, but the effect may be small and therefore overshadowed by other factors.

Participants who reported higher levels of marital satisfaction evidenced lower levels of anger, depression, anxiety, and PTSD. This indicates that the quality of the intimate partner relationship may be a key resiliency factor for reducing the risk of mental health problems in reserve and National Guard soldiers who have experienced deployment. Marital partners as well as significant others (co-habitating partners) may be especially important sources of support for reserve and National Guard soldiers who have less connection to the institutional supports of the military and may lack consistent peer interaction with other soldiers once they return from deployment (Pfeiffer et al., 2012). Interventions that focus on strengthening and rebuilding intimate/marital relationships throughout the deployment cycle (pre-deployment, during deployment, and post-deployment) may be effective ways to promote positive mental health outcomes among reserve soldiers. While there are increasing numbers of interventions and treatments aimed at both the soldier and his/her partner, and in some cases the family unit (Fischer et al., 2015; Lewis, Lamson, & White, 2016; Monson, Schnurr, Stevens, & Guthrie, 2004; Monson et al., 2009), marital satisfaction and other relationship factors are usually addressed as intervention outcomes (Monson et al., 2004; Taft, Macdonald, Creech, Monson, & Murphy, 2015), rather than as targets for intervention which may lead to improvements in other outcomes, such as PTSD. Couple-based programs and interventions have been shown to be effective in increasing marital satisfaction (Lewis et al., 2016; Monson et al., 2004) and in reducing adverse outcomes, such as intimate partner violence (Taft et al., 2015; Taft et al., 2013). Programs like Mission Reconnect- a partner-based, self-directed program of integrative therapies, including massage, have demonstrated significant improvements in PTSD, depression and stress (Collinge, Kahn, & Soltysik, 2012). However, further work is needed in this area to determine if increases in marital satisfaction as a result of couple-based therapies contribute to further improvements in mental health outcomes in the long-term, after interventions have ended. In addition, most of the work in this area has been around intervention and treatment *after* a soldier has been diagnosed with PTSD. Programs designed to increase marital satisfaction and the strength of the intimate partner relationship *prior* to deployment and combat exposure need to be explored and tested as possible protective factors against the development of PTSD and other mental health problems.

Limitations

The data presented here are subject to a few limitations. First, all data are self-reported by participants and mental health concerns were not clinically-verified. However, this method is standard for collecting this type of information, and all mental health data were collected using validated clinical tools. Second, these results represent baseline data from an ongoing

longitudinal study; additional years of data may shed new light on baseline trends or alter additional findings. Finally, due to the nature of the study, we were unable to assess for factors, such as pre-deployment and/or pre-military service mental health status. However, we did ask about pre-military experiences, such as childhood maltreatment and life events that may provide evidence of pre-military or pre-deployment stressors that could contribute to mental health outcomes. Longitudinal data collected in future phases of this project will allow us to monitor trends over time in mental health outcomes and compare pre and post deployment mental health for soldiers who deploy during the study period.

CONCLUSION

In conclusion, our results indicate that marital satisfaction may be a key resiliency factor for a range of mental health outcomes among previously deployed reserve and National Guard soldiers. Future research should consider the specific aspects of marital relationships that are most protective and develop interventions that can be provided jointly to the soldier and his/her partner throughout the deployment cycle to facilitate stronger relationships and promote improved mental health and reintegration post-deployment.

Acknowledgments

Portions of this work were presented at the 143rd Annual Meeting of the American Public Health Association, Chicago, Illinois (2015).

FUNDING:

Research reported in this publication was supported by the National Institute on Drug Abuse of the National Institutes of Health under award number R01DA034072 (GGH). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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Table 1
Demographic Characteristics for Male Soldiers (n=248)

% (n) or mean (sd)

Years of Service	11.9 (6.0)
Combat Exposure	32.2 (16.5)
Rank	
Officers	14.1% (35)
Enlisted	84.7% (210)
Race/Ethnicity	
Non-Hispanic White	81.1% (201)
Non-Hispanic Black	4.4% (11)
Hispanic	9.7% (24)
Other	3.2% (8)
Education	
<HS – HS Grad	14.1% (35)
Some College	60.1% (149)
College +	25.8% (64)
Income	
≤ $19,999	1.6% (4)
$20,000 – $39,999	16.9% (42)
$40,000 – $59,999	23.0% (57)
$60,000 – $79,999	21.0% (52)
$80,000 – $99,999	12.1% (30)
$100,000 – $119,999	10.9% (27)
≥ $120,000	11.3% (28)
Married	75.4% (187)
Cohabitating	24.6% (61)
Age	33.4 (6.2)

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Table 2
Mental Health Outcomes & Resiliency Factors for Male Soldiers (n=248)

mean score (sd)

Anger	18.15 (7.13)
Depression	3.69 (4.39)
PTSD	10.38 (11.82)
Anxiety	4.45 (5.49)
Deployment Preparation	37.31 (9.49)
Unit Support	45.73 (11.34)
Marital Satisfaction	110.63 (28.38)
Family Support	33.94 (7.24)

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Table 3

Unadjusted and Adjusted Results for Resiliency Factors and Mental Health Outcomes (N=248)

b [95% CI]

	Anger		Depression		Anxiety		PTSD	
	Unadjusted	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**
Deployment Preparation	−0.13 ** [−0.23, −0.04]	−0.04 [−0.14, 0.06]	−0.05 [−0.11, 0.01]	−0.01 [−0.08, 0.05]	−0.06 [−0.13, 0.01]	−0.03 [−0.11, 0.05]	−0.25 ** [−0.41, −0.10]	−0.19 * [−0.37, −0.02]
Unit Support	−0.11 ** [−0.19, −0.03]	−0.12 ** [−0.21, −0.04]	−0.03 [−0.08, 0.01]	−0.04 [−0.09, −0.01]	−0.03 [−0.09, 0.03]	−0.03 [−0.10, 0.04]	−0.08 [−0.21, 0.05]	−0.005 [−0.14, 0.15]
Husband's Marital Satisfaction	−0.10 *** [−0.12, −0.08]	−0.11 *** [−0.14, −0.07]	−0.05 *** [−0.06, −0.03]	−0.05 *** [−0.07, −0.03]	−0.06 *** [−0.08, −0.04]	−0.06 *** [−0.09, −0.03]	−0.14 *** [−0.19, −0.10]	−0.12 *** [−0.17, −0.06]
Family Support	−0.09 [−0.21, 0.03]	0.08 [−0.05, 0.21]	−0.08 * [−0.16, −0.01]	0.03 [−0.05, 0.11]	−0.07 [−0.17, 0.02]	0.04 [−0.07, 0.14]	−0.31 ** [−0.51, −0.11]	−0.05 [−0.27, 0.17]
Wife's Marital Satisfaction		−0.01 [−0.04, 0.02]		−0.01 [−0.03, 0.01]		−0.01 [−0.03, 0.02]		0.01 [−0.04, 0.07]
Combat Exposure		3.17 ** [1.36, 4.98]		1.68 ** [0.51, 2.86]		1.96 * [0.45, 3.46]		5.86 *** [2.72, 9.01]
Years of Service		0.03 [−0.11, 0.16]		−0.02 [−0.11, 0.07]		−0.004 [−0.12, 0.11]		0.09 [−0.15, 0.32]
Military Rank		0.76 [−1.51, 3.03]		−0.68 [−2.15, 0.79]		1.08 [−0.80, 2.96]		0.94 [−3.01, 4.88]

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$

Unadjusted models examined each resiliency factor individually, by mental health outcome.

Adjusted models examined the four resiliency factors, controlling for wife's marital satisfaction, and husband's combat exposure, years of service, and military rank